The Macroeconomics of Populism
A Quantitative Analysis of the Economic Consequences of Populism in Europe

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Preface and Acknowledgements

I dedicate this work to my family, who made it possible for me to enjoy a first-class education and always encouraged me throughout my academic and professional career.

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Abstract

This paper analyses the economic consequences of political populism and its effect on future returns of macroeconomic key variables such as foreign exchange rates, equity indices, inflation, and total reserves including gold. In particular, we construct a right-wing authoritarian populism indicator to identify populist governments during the period from 2000 to 2015 and link historical information on elections to financial data, which allows us to observe the phenomena of populism in an interdisciplinary context. We then design an empirical analysis to investigate a potential correlation between the indicator and subsequent returns of macro-variables. While the precision of the constructed indicator cannot be evaluated we find some evidence for a negative relationship between the election of populist parties and returns of foreign exchange rates, predominantly in low GDP/capita countries. We confirm this negative correlation for returns of reserves, however cannot prove its statistical relevancy. The effects of the remaining variables remain unclear and do not point towards any systematic interaction with the populism indicator.

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1 Introduction

Populism is a widely used term to describe a certain political style, however its exact meaning is controversial and political science does not seem to have a clear or universal definition for this global phenomenon (Pappas, 2016). This paper does not aim to elaborate on this fundamental ambiguity or discuss different manifestations of populism but rather defines a set of indicators to identify and quantify populism in order to observe the development of macroeconomic key variables during the course of populist led economies. To be precise, we build the *Effective Right-wing Authoritarian* (ERA) indicator as a measure of populism and analyze the following question. *What are the macroeconomic consequences[1] of populism, measured through the ERA?* The motivation of this research dates back to Dornbusch & Edwards (1991) who covered much ground in the field of political science in an economic context. In their paper, The Macroeconomics of Populism they break down the gradual evolution of populism from a political perspective and put it in an economic framework to observe the economic and financial consequences systematically over time (Dornbusch & Edwards, 1991). In particular they describe the development of populism and subdivide the macroeconomic consequences into four phases as follows.

They argue that the origin of populism is typically found in a socioeconomic dissatisfaction caused by moderate economic growth and a highly uneven income distribution often as a consequence of the implementation of a less successful IMF program that has limited the country's financial flexibility. The population's strong feeling that things can be better lays the foundation for the empowerment of populist politicians and their promises of a better future through simplistic economic policies based on the rejection of any type of financial constraints. The run down of monetary reserves and increased deficit finance provide the resources for economic stimulus and expansion. Finally, an increase in real wages is introduced that does not translate into higher prices to support the reallocation of private capital and to counteract the income distribution problem ignoring inflationary pressures. According to Dornbusch & Edwards (1991) these political circumstances result in problematic macroeconomic consequences which can be broken down into four phases (Dornbusch & Edwards, 1991).

$$Expansion \rightarrow Decumulation \rightarrow Destabilization \rightarrow Intervention^2 \qquad (1)$$

Initial economic conditions are solid, the run down of inventories and expansive monetary policy leads to growth in output and real wages with low unemployment while having little impact on inflation due to elevated demand dynamics. The excessive decumulation of state assets reaches limits and the economy runs into bottlenecks. Rising inflation forces the government to subsidise wages and the value of their currency to avoid a further deterioration of the country's budget. Destabilization takes over as inflation skyrockets and the gap in foreign exchange leads to capital flight and demonetization of the economy. The catastrophic economic situation often requires a new government or external intervention through the launch of an IMF program (Dornbusch & Edwards, 1991).[3]

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[1]In this paper we use future returns of exchange rates, stock indices, inflation and total reserves as a proxy for national macroeconomic development.

[2]The terms used in Equation 1 serve as a simplification only and do not replicate the exact wording as described in Dornbusch & Edwards (1991), however summarize the key events in a chronological order.

[3]This recap does not serve as the basis for our empirical approach but should rather provide the reader with the crucial information to understand the foundation our argumentation is built on.

While Dornbusch & Edwards (1991) explicitly focus on Latin American economies we will concentrate on the European continent and use a systematic approach to narrow down our full database covering 37 countries[4] by applying political indicators and factors that are consistent with the general consensus about populism in political science. As mentioned above we do not seek to redefine populism, however we are required to rely on existing determinations that can be translated into numeric data in order to investigate the impact of populism statistically.

Furthermore, our analysis does not follow the methodology used by Dornbusch & Edwards (1991) but extends the set of economic metrics to be observed. The original paper specifically focuses on inflation, output growth measured as GDP, real wages and employment. While these measures have been impacted significantly throughout the populist led periods observed we argue that wages and employment data are sticky and do not capture short term effects of changes in economic policies as more liquid macroeconomic measures like foreign exchange rates or inflation do (Watson, 1997).

In addition to the macroeconomic metrics used in the original paper we add stock returns to our data set due to the following reasons. Most importantly, because the price formation process of stock prices is driven directly by investors and their believes not only about a certain company's future performance but also about the country it is located in. Stock prices are liquid financial instruments especially when compared to macroeconomic magnitudes such as employment and wages and as a consequence react more quickly to economic and political shocks. Additionally, historic data availability and data frequency of equity prices allows to define precise cut off dates to isolate election results. We use stock indices for the respective countries as an aggregate equity value which allows us to capture equity valuations at a country level and thereby capture macroeconomic risks associated with a certain country. To summarize, the variables used in this empirical study are returns of reserves[5], foreign exchange rates, inflation and stock indices and will be explained in detail in section 2.

Two comprehensive data sets provided by the *Parliaments and Governments Database* covering historical data on 1600 parties from 950 elections such as election results and political indicators build the foundation of our analysis going forward. A unique party ID allows to match party specific information to historical election statistics so that the database can be sorted on different political indicators[6], nationality and election dates. The below defined party selection process filters out the final list of countries, which we then link to macroeconomic variables for the respective time periods. This allows us to perform a set of statistical analyses to investigate the economic consequences of populism quantitatively and test the hypotheses[7] made and economic developments described by Dornbusch & Edwards (1991) and (1989) for European countries.

We perform a set of regressions to detect potential economic consequences populism mea-

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[4]Data on elections, number of votes and characteristic indicators are downloaded from parlgov.org

[5]Reserves include monetary gold, drawing rights, reserves of IMF members held by the IMF, and holdings of foreign exchange under the control of monetary authorities.

[6]A detailed description of the indicators applied on the data is given in Section 3. This database also serves as the basis for our quantitative analysis and ultimately lays the foundation for this interdisciplinary research.

[7]For simplicity, the economic developments found by Dornbusch & Edwards (1989) and (1991) as outlined in sections 1 and 2 will be referred to as their hypotheses going forward.

sured through a new populism indicator. In particular, as a first step we define the *Effective Right-wing Authoritarian* (ERA) indicator as the independent variable to gauge the effect of populism on future returns of reserves, foreign exchange rates, inflation and equity indices. According to Dornbusch & Edwards (1989), who postulate a depreciation of the currency, a surge in inflation and a decumulation of reserves[8] we expect a similar evolution of these variables over time. As equity indices have not been investigated in their research and there is no uncontroversial relationship between right-wing populism and future equity index returns documented we will discuss the economic intuition behind such a potential relationship in Section 2.

Our results allow to confirm that there is a negative relationship between the ERA and subsequent returns of foreign exchange rates over the pre-defined time horizon of 6 years. Moreover, we find that the ERA is negatively correlated with the future development of total reserves, which however is not statistically relevant. Both findings, reconfirm the results of Dornbusch & Edwards (1989) from their analysis of Latin American countries for our dataset covering the European continent. The effects of the remaining variables remain unclear and do not show any significant or systematic interplay with populism. As a next step, we break down our group of countries into Developed and Emerging Market countries and re-run the regressions outlined in Section 4.2 with the ERA as the independent variable to observe any potential differences in the correlations with the selected variables between these groups.

Our results provide some evidence for a negative correlation between the ERA and 6 year returns of foreign exchange rates. While the remaining macro-variables do not show any significant relationship with the ERA we find that both future returns of reserves and foreign exchange rates are lower in high ERA countries. The correlation tends to be stronger in countries with relatively low GDP per capita levels.

The rest of the paper is organized as follows. Section 2 reviews and discusses relevant literature on political populism we rely on to calibrate numerical indicators to existing qualitative definitions. Section 3 describes the data and explains the categorization of populism as well as the selection process used to arrive at our final list of countries for our empirical analysis. Sections 4 and 4.2 outline the empirical approach and section 5 presents the results, concludes and points out limitations and potential implications of this study.

2 Literature review

Populism has been a prevailing political style since the early 20th century and has massively gained in popularity throughout the last 20 years in many western civilizations and especially across the European continent (Heinö, 2016). Recent political developments have made populism a trivial term for the public that is heavily used to express criticism on different political styles and politicians drawing on populist language which in most cases is not consistent with scientific definitions. Although this global political phenomenon has been observed since the 1960s research has not found common ground on the definition of populism. Nonetheless, it appears that political scientists systemat-

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[8]The hypotheses made by Dornbusch & Edwards (1989) as stated here are summarized in section 1 and in particular in Equation 1. In their paper they do not explicitly define their hypotheses but rather explain the relationships they expect to observe in economic data throughout the periods of populist led countries. The relationships they have found are the base case for our empirical analysis.

ically tie populism around two pivotal dimensions. In particular, a party's positioning on the horizontal political spectrum, from the radical left to the radical right, and the hierarchical structure and leadership style (Weyland, 1999) and (Mudde, 2010). While the former is well established, both in research and the general public, the latter appears to be less popular and rather complex. For simplicity we define the sphere in which political characteristics range from liberal at the bottom to authoritarian at the top as the vertical spectrum. Contrary to the horizontal spectrum populist parties and their leaders clearly concentrate on the authoritarian north of the vertical sphere. Their political similarities to the behaviour of authoritarian regimes have been outlined recently in *What is populism?* by Müller (2017) in a profound analysis of populism.

Mukand and Rodrik (2015) analyse populism in an economic context and argue that exacerbated by globalization, economic anxiety and distributional struggles build a breeding ground for populism and differentiate between right- and left-wing populism, which grow around political conflicts targeted at certain groups in society that tend to escalate in ethno-national/cultural cleavage[9] (right-wing) or income/social class cleavage (left-wing) (Mukand & Rodrik, 2015). A more recent study builds upon this reasoning and differentiates the two most common forms of populism as follows.

> *"Populists who focus on the identity cleavage demonize foreigners or minorities which ultimately results in right-wing populism. Those who emphasize the income cleavage target the wealthy and corporate elite and thereby produce left-wing populism".*

Despite general dissension in the existing definitions of populism numerous studies tend to classify populist regimes as authoritarian political structures that challenge the corrupt elite and encourage the ordinary people with nationalistic rhetoric (Jansen, 2011). Following this logic two different manifestations of populism at the extremes of the horizontal political spectrum occur while eliminating a theoretical liberal form of populism with the vertical dimension being fixed at the authoritarian end.

Various forms of populism have been observed and documented across the globe, however voter support for left- and right-wing populist parties varies depended on geographical factors. Most notably, Latin America being a stronghold for the radical left form of populism with Hugo Chávez of Venezuela and Cristina Fernández de Kirchner followed by Néstor Kirchner of Argenitna representing just a few of the key persons in the history of populism. Considering recent economic developments in both countries named above provides reasons to support the hypotheses stipulated by Dornbusch & Edwards (1989) that populism leads to devaluation of the currency, a steep increase in inflation and a decumulation of the countries international reserves long before the authors have anticipated such a development.

On the other hand, radical right-wing populism has been primarily concentrated in Europe, where the before mentioned ethno-national and cultural cleavage appears to be a

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[9]In this context the term cleavage specifically refers to a fundamental divide or divergence between two social or cultural groups which often materializes in a confrontation of two major national political powers.

main driver of the voters' demand for this ideology, which is strongly represented in Eastern Europe (Učeň, 2007). Focusing on the European continent two eminent cases are, the Hungarian party *Fidesz* with its president and current prime minister Viktor Orbán on the radical right and *Podemos* in Spain on the far left with the former being categorized to the identity origin while the Spanish party finds its populist essence in the demonization of the elites. Again, both targeting a specific social class as classified by (Rodrik, 2018). Although, political science and to some extent economics have covered much ground on the various forms and routes of populism in recent years studies on the potential economic effects of such parties once in power have been rather limited. To name one recent work, Kaltwasser (2018) discusses historic cases of populism but does not reveal empirical evidence of economic effects (Kaltwasser, 2018). A second study investigates the drivers of voters' demand for populist parties quantitatively and finds that unemployment is positively correlated with support for populism and that societies with a growing unskilled labor force are less likely to vote in favor of the ruling government (Guriev, 2018).

Finally, after reviewing literature across scientific disciplines and subjects we find that *The Macroeconomics of Populism* by Dornbusch & Edwards (1991) was the only one, to our knowledge to focus on the post populism returns of macroeconomic indicators such as reserves, foreign exchange and inflation. However, taking a broader view on the intersection of financial markets and politics we do find preceding work that addressed the challenge around the quantification of political data. One study develops an index to track policy uncertainty through political news coverage and finds that spikes in the index come with concurrent high equity volatility. Furthermore, the index is negatively correlated with investment and employment, however the study does not investigate medium to long term effects on macro-variables (Baker, Bloom, & Davis, 2016).

Similarly, Pastor & Veronesi (2016) detect that political uncertainty has a negative impact on stock prices and increases correlation between single stocks. While these two studies do not aim to observe potential impacts of certain political styles on macroeconomic metrics over a multi-year period, their findings give reasons to suggest the existence of some economic information carried by politics that is observable in financial markets (Pastor & Veronesi, 2012). Longer effects of populism on stock prices have been found by Pastor and Veronesi (2018). They use a similar set of political indicators from the *International Social Survey Programme*[10] to proxy nationalism and autarky through data on inequality. The closest political relatives to these forms would be represented by parties located in the bottom-right corner of Graph 1. Their model output suggests that a move to autarky leads to an increase in U.S. stock prices (Pastor & Veronesi, 2018). However, they measure equity as the country's stock market capitalization over its GDP, which in our view does not fully reflect the value of stocks. First, because clearly GDP and the aggregated stock market capitalization are closely related to each other and second, assuming populism has a negative effect on macroeconomics, it would most likely lead to a drop in GDP, which by definition would then lead to a higher market capitalization to GDP ratio.

Potential reasons for the lack of more quantitative empirical evidence in this area of research are not clear, however we have found that the ambiguity around the definition of populism and the limited data availability are at least two. At this point we also want to mention that our approach to this problem is only one possible route to measure the effects of populism empirically and has not been documented or confirmed by precedent research.

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[10]www.issp.org

Our research is designed to observe potential relationships between populism, measured through the ERA, and future developments of macroeconomic variables, which can be summarized as follows. *What are the macroeconomic consequences of populism?* More particularly, and assuming that our ERA indicator correctly captures populism[11], does populism produce negative future returns of reserves, foreign exchange rates and equity indices and an increase in inflation? Dornbusch & Edwards (1989), found that this was indeed the case for foreign exchange rates, reserves and inflation in their study of Chile under Allende and Peru under Garcia. Just two years later, in 1991, Dornbusch & Edwards published a more comprehensive work studying the same relationships also for Argentina, Brazil, Mexico and Nicaragua (Dornbusch & Edwards, 1991). They found that these countries experienced an economic development similar to Chile and Peru and as summarized in Equation 1.

Let us break down the generalization of the overall consequences of populism into four specific relationships and isolate them for now. We build on the discussion above and consider the period from the beginning of a populist led legislation. Populists were found to make extensive use of short-sighted economic policies that borrow from the future to increase today's economic well-being (Dornbusch & Edwards, 1989). With the run down of reserves governments fund increased imports and accelerate growth via the decumulation of state assets. The rejection of budget restrictions and increased government spending leads to an increase in domestic price levels with economic output remaining relatively low. This explains the economic intuition of the first hypothesis we want to investigate. *The ERA is negatively correlated with future returns of reserves.* While this relationship is rather simple, it is theoretically connected to the developments of the remaining variables. As mentioned above, foreign exchange rates were found to be negatively impacted by populism (Dornbusch & Edwards, 1991). The increase in imports, purchased with national currency, and concurrent stable economic output and exports creates an oversupply on the international foreign exchange market. This supply overhang creates downward pressure on the exchange rate. In addition, once reserves are ran down to their minimum, the economic expansion will need to be financed by monetary stimulus or the issuance of debt by the government, which increases inflationary pressures on the currency. These relationships have been studied extensively in the context of international capital flows (Lane & Milesi-Ferretti, 2007). Moreover, Cavallo and Ghironi (2002) found that capital outflow (decumulation of net domestic assets) generates a depreciation of the exchange rate. Based on this, we derive a second hypothesis. *The ERA is negatively correlated with future returns of foreign exchange rates.*

The third macroeconomic variable, inflation is related to reserves and exchange rates but of a more complex nature. While Dornbusch and Edwards do find a clear negative relationship between populism and inflation in Latin America, they do not explain the economic mechanism behind it. They primarily tie it to the increase in nominal prices boosted by a rise in consumption. However, this addresses only one part of the potential reasons that drive inflation in populist led countries. We add that the aggressive overexpansion financed through unsustainably high money supply generates additional inflationary pressures. This leads to our third hypothesis. *The ERA is positively correlated with future returns of inflation.*

Lastly, we address the potential relationship between the ERA and subsequent returns of equity indices. Development of equity indices have not been discussed or studied by Dorn-

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[11]The form of populism that shall be captured by the ERA is right-wing populism or a combination of authoritarian and right-wing political leadership as outlined in Figure 1.

busch & Edwards, however we find ample reason to include them. First, equity markets have developed significantly throughout the last twenty years and since the publication of *The Macroeconomics of Populism* by Dornbusch & Edwards. Hence, they have become more liquid and responsive not only to macroeconomic developments but also politics (Pastor & Veronesi, 2012). While the long-term effects of populism on stock prices have not been studied in particular by previous research, to the best of our knowledge, there is existent empirical evidence that country risk impacts equity valuations. Erb, Harvey, and Viskanta (1996) found that different measures of country risk, such as credit ratings and other indicators of financial risk of sovereigns are negatively correlated with future expected stock returns. If populism leads to the economic downturn and financial distress explained by Dornbusch & Edwards, then a country's risk of default should increase as result, which would lead to a sell-off in stocks. Consequently, we define our fourth hypothesis as follows. *The ERA is negatively correlated with future returns of equity indices.*

For all of the four macroeconomic metrics we use, Dornbusch & Edwards found evidence that the impact of populism on these metrics becomes stronger over time. Moreover, the four phases described in their research, summarized by Equation 1, describe a process that evolves throughout the observed time period. The economic intuition behind this process is, that it might take some time for the economic policies introduced by populists to materialize in financial markets or macroeconomic data. Previous research suggests that markets react immediately, at the time of election of a new government, as volatility tends to spike around such events (Pastor & Veronesi, 2012). However, there is empirical evidence that the macroeconomic developments as a result of increased country risk do also evolve over time (Erb et al., 1996) and (Dornbusch & Edwards, 1989). To test whether the consequences of populism, measured through the ERA, evolve over time we define the fifth hypothesis. *The correlation between the ERA and subsequent returns of reserves, foreign exchange rates, equity indices and inflation are time dependent.* Moreoever, Erb et al. (1996) argue that the negative impact is stronger pronounced in less developed countries, which raises the question whether some countries in our dataset might be stronger affected by populism than others. At this point we want to highlight that our research focuses on non Euro countries from the European continent from 2000 to 2015, which are considered more solid from an economic as well as political perspective than most Latin American countries were in the 70s and 80s. In addition, our results show that there are a few outliers such as Turkey, Hungary and Bulgaria which seem to be stronger affected by the ERA. We will address this potential difference by building two groups of countries. A high GDP per capita group and a low GDP per capita group. Based on this logic we define our sixth and last hypothesis. *The macroeconomic consequences of populism are more pronounced for low GDP countries than for high GDP countries.* We summarize the hypotheses derived in this section below.

H1: The Effective Right-wing Authoritarian Indicator is negatively correlated with subsequent returns of reserves[12]
H2: The Effective Right-wing Authoritarian Indicator is negatively correlated with subsequent returns of foreign exchange rates.
H3: The Effective Right-wing Authoritarian Indicator is positively correlated with subsequent returns of inflation.

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[12]Total reserves include monetary gold, drawing rights, reserves of IMF members held by the IMF, and holdings of foreign exchange under the control of monetary authorities.

H4: The Effective Right-wing Authoritarian Indicator is negatively correlated with subsequent returns of equity indices.
H5: The correlation between the ERA and subsequent returns of reserves, foreign exchange rates, equity indices and inflation is time dependent.
H6: Populism, measured through the Effective Right-wing Authoritarian Indicator, has a stronger effect on low GDP per capita countries than on high GDP per capita countries.

2.1 Quantifying populism

This section deals with the fundamental problem of our analysis and the general challenge concerning interdisciplinary research where one of the disciplines is not of quantitative nature. In order to investigate the consequences of populism in an economic setting we need to translate qualitative information into numeric data which allow us to capture and measure any potential effects empirically.

Given there is no unequivocally verbal definition of populism in political science there is neither an existing numeric indicator for populism nor an obvious way of assigning earlier defined political indicators to populist parties. To answer this crucial question we build upon the discussion from the literature review above.
While Dornbusch & Edwards (1991) focus on Latin America and mainly observe left-wing populism and consequently the causes of left-wing populist economic policies we concentrate on Europe[13] where the predominant form of populism is Latin America's counterpart on the radical right. Hence, the political ideology we have to replicate numerically is *right-wing populism*. Theoretically, the horizontal dimension, from left- to right-wing populism could be subdivided into a variety of manifestations of populism as outlined by Pappas (2016) in their qualitative analysis of modern populism. However, after reviewing the different concepts and characteristics of these manifestations we come to the conclusion that the origin of populist movements are often similar.
Dornbusch & Edwards (1989) and (1991) argue that a general dissatisfaction of the population makes voters more receptive to populism and in particular the radical changes it promises when socioeconomic perspectives are poor. With the above described dissatisfaction being the ultimate originator, the emergence of populism can be the result of at least two kinds of societal grievances, defined as the income- and the ethnological-cleavage. The former resulting from a highly asymmetric wealth and income distribution and the latter stemming from a cultural or identity problem often channeled through the demonetization of minorities or the immigration of foreign culture that would produce right-wing populism (Mukand & Rodrik, 2015).

Geopolitical tensions across the Eurasian continent and the displacement of established power structures in the middle-east led to mass emigration to Europe, which after a years-long stagnating European economy provided the final recipient for a right-wing populist breeding ground (Mudde, 2016). These developments provide an ideal case to study the economic consequences of the surge in populism across Europe which this research aims to do. The starting point for our quantitative analysis is a comprehensive database

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[13]Based on prior research on the geographic and political belonging of Turkey to Europe we consider it as a part of the European continent and hence, include it in our database (Gerhards & Hans, 2011).

retrieved from the *Parliament and Governments Database*[14] that also includes a set of predefined political indicators. In particular, we follow the process of Heinö (2016) and identify populism through a combination of certain indicators that mirror the consensus of the definition of populism collected from previous qualitative studies (Heinö, 2016). Heinö (2016) constructed an indicator that seeks to capture both, right- and left- wing populism. The indicator also identifies a parties political orientation through the left- to right-wing scale developed by Huber and Inglehart (1995) and a combination of other criteria provided by the CHES (Chapel Hill Expert Survey)[15](Huber & Inglehart, 1995). Similarly, we assign a value from the left- to right-wing scale to every party and additionally apply the Benoit Laver (2006) indicator to differentiate between authoritarian and liberal parties[16].

By implication, we finally identify right-wing authoritarian parties through concurrent high values of the left- to right-wing and the liberal to authoritarian indicators. This combination of indicators translates the form of populism that is analysed empirically in this paper into numeric values and thereby forms a newly defined indicator, which we call the *Effective Right-wing Authoritarian* indicator or simply the *ERA*. Consequently, high ERA values indicate authoritarian political parties positioned on the very right of the horizontal political spectrum. For simplicity we call the political ideology defined by the ERA *right-wing populism* going forward.

3   Data and Methodology

We antedate the data section in this paper as it is essential for the subsequent explanation and the empirical analysis of this research presented in Sections 3 to 4.

This section describes the sources and data used to build the empirical foundation of our analysis. It describes the process applied to arrive at the final list of countries to be investigated and the quantification of populism through the (ERA). Finally, it presents summary statistics of the data before and after the application of our party selection process.

The analysis requires both, qualitative political data translated into numeric values as well as financial data on macroeconomic variables such as foreign exchange rates, stock indices, inflation and total reserves. These data are then matched to specific countries through unique identifiers of political parties at the time of a parliamentary election and a selected future date to observe and isolate potential changes in financial data resulting from the policies introduced by the elected parties.

For the quantification of political information, two data sets retrieved from the *Parliament and Governments Database* build the basis. One containing historical political information on a party level and the other one on an election level. The former covers historic political data on 37 EU and OECD countries and combines approximately 1600 parties from 950 elections ranging from the year 1900 to 2018. In a first step we merge the two files by matching the data through a unique party identifier defined by *parlgov.org*. This returns a comprehensive database that allows us to sort on various criteria such as coun-

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[14]www.parlgov.org

[15]The Chapel Hill expert surveys estimate party positioning on European integration, ideology and policy issues for national parties in a variety of European countries and covers 268 different national parties.

[16]The Benoit Laver or the liberal to authoritarian indicator numbers parties based on their positioning on the vertical dimension shown by Figure 1

tries, parties, election type, election results, seats in parliament and a set of predefined political indicators. These include the Huber Inglehart (1995), Benoit Laver (2006) and CHES (2010) left- to right- wing scale as well as the liberty to authority scale, an EU profiler indicating the parties' position on an EU-contra to EU-pro spectrum and a state to market index measuring a party's conception towards the organization of the market economy[17] (Huber & Inglehart, 1995) (Benoit & Laver, 2006).

Given there is neither a predefined socioeconomic or political indicator nor a universal qualitative or quantitative framework which measures populism to the best of our knowledge, as of the time of publication of this paper, we build a new indicator as a proxy of political populism. We identify right-wing populist parties through concurrent high values on the left- to right-wing scale and the liberty- to authority-scale and assign these values to all political parties covered by the data set for every year and month. Before we sort the data based on these criteria we need to narrow down the data set to a selection of countries which can be linked to financial data to observe the economic consequences caused by the policies of populist parties. The selection process is defined in section 3.2. The macroeconomic variables used in our analysis are cross foreign exchange rates quoted against the US Dollar[18], equity index cash prices, inflation data via the Consumer Price Index (CPI) and total reserves of the respective countries. We use cross foreign exchange rates to avoid the confusion around the depreciation and appreciation of the currency so that an increase in the foreign exchange rate always reflects an appreciation and vice versa. Foreign exchange rates are retrieved from Bloomberg. While there are various inflation metrics we rely on the *Consumer Price Index (CPI)*, which uses a standardized methodology based on the price development of a harmonized basket of goods. These data is downloaded from the Worldbank Database, and fed through the official national statistic authorities. Equity index data is used on an aggregated basis through stock indices. This provides a better representation of the corporate profitability on a national level than observing single stock data, and also allows us to add a corporate finance angle into the research as national politics might as well affect capital markets. Equity data is also sourced from Bloomberg. Lastly, data on total reserves, which include monetary gold, drawing rights, reserves of IMF members held by the IMF, and holdings of foreign exchange under the control of monetary authorities[19]. We download these data from the Worldbank Database[20].

Data on foreign exchange rates and equity indices are available on a daily basis whereas the frequency for inflation and reserves is measured only monthly and annually respectively. Hence, when matching macroeconomic data to elections foreign exchange rates and equity index prices are directly linked to the exact date of an election. Inflation and total reserves however are only connected through the next annual reference point.

At this point it is worth mentioning that the timing aspect for this analysis is rather com-

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[17]The dataset also contains other political indicators however, these do not add any relevant characteristics of individual parties which would allow us to identify right-wing populism. Hence, we leave these indicators out for now and do not include any further description of them in this paper.

[18]We use cross rates to avoid miss understandings in the interpretation of the graphical depiction. By contrast, spot foreign exchange rates are always quoted versus the US Dollar, which means that by construction, an increase in the spot price equals a decrease in the value of the currency in units of US Dollars.

[19]The gold portion included in the aggregate amount of total reserves is valued at the end of each year at London prices and according to the statistical standards outlined in the Balance of Payments by the International Monetary Fund (IMF). We particularly choose this measure due to its standardized calculation across countries, which makes it easier to compare and interpret data at an international level

[20]data.worldbank.org

plex as it is unclear how long it takes to observe measurable effects, if any, from policies introduced by populist parties. Hence, we break down the period in which such a cause and effect relationship might appear into three different time horizons. In particular, a two-, four- and six-year window in order to leave sufficient time for the policies to materialize. The final data set covers the period from January 2000 to April 2019 for foreign exchange rates and equity indices and the period from January 2000 to December 2018 for the less frequent series, inflation and total reserves.

After running the data through the party selection process, explained in Section 3.2, we arrive at the final list of countries to be investigated, which is presented by Table 2.

3.1 The Effective Right-wing Authoritarian indicator (ERA)

This section explains the definition of the Effective Right-wing Authoritarian indicator, which builds the foundation of the analysis going forward and discusses potential implications and its robustness. We identified two fundamental challenges related to the creation of the ERA that are both essential for the indicator's precision and ability to identify populist parties. First, the ambiguity around the definition of populism in political science, and second, the quantification of populism through the calibration of data to represent this specific political ideology. At this point we also want to mention that the ERA might not be the most precise indicator to measure a certain form of populism but rather serves as an approximation that allows to quantify the ideology and effectively apply link it numerical data.

As we have outlined earlier, we categorize the various manifestations of populism along two spectra. The vertical, ranging from liberalism at the bottom to autocracy at the northern end and the horizontal spectrum covering the political spectra from the radical left to the radical right or from extreme socialism to extreme nationalism. This should not be confused with the ethnological- or income-cleavage as they might be a cause for a certain populist ideology but there is no clear or empirical casualty between them (Rodrik, 2018). Figure 1 depicts the localisation of populism as identified by the ERA. Concurrent high values on the left- to right-wing scale and the liberty to authoritarian scale define populist parties on the top right hand corner of this political coordinate system. High ERA countries are found in the north-east section of this diagram and are defined as right-wing populist in this study.

To guage the economic information carried by the *Effective Right-wing Authoritarian* (ERA) indicator we plot the changes of the national currencies against the US Dollar quoted as cross rates. In particular, we consider the maximum ERA value for each country and within a certain election year and assign the respective foreign exchange rate at the day of election, and two, four and six years past that election. The difference should thereby capture the economic effect of the party in power channeled through financial markets[21]. This may not be the most precise method to identify populism on a single party or country level, however it is, as outlined in section 2 and consistent with previous research, the closest relative to populism we could identify. Furthermore, we find that the selection process results predominantly parties from Eastern Europe such as Hungary and Bulgaria which have been described as text book examples of modern populism, and most

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[21]The cross-national analysis shows a slight negative relationship between the ERA and subsequent foreign exchange returns, which provides some evidence for a potential negative economic effect of populism. We discuss the statistical relevancy of this relationship and its economic intuition in Section 3

prominently Turkey, which has a true track record of populism since the inauguration of the leader of the AKP, Recep Tayyip Erdoğan (Weyland, 1999), (Učeň, 2007).

Figure 1: Localisation of populism through the ERA indicator
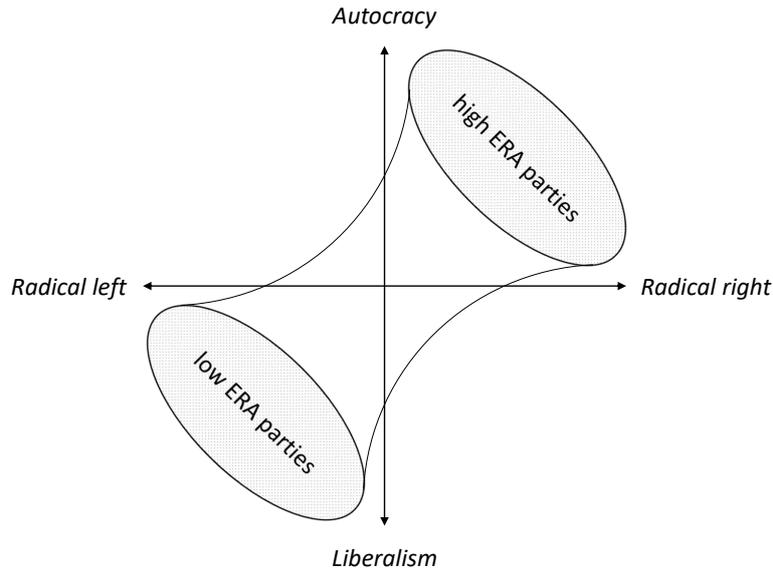
3.2 Party selection process

Our quantitative analysis focuses on political parties from the European continent plus Turkey whose political and geographic belonging is ambiguous and often referred to as a part of the Eurasian continent. Survey data shows however, that despite strong rejection of experts about Turkey to join the EU the majority of interviewees agrees that Turkey both historically and geographically belongs to Europe (Gerhards & Hans, 2011).

Since data on elections goes back to 1900 we first need to cut off the data set to set a certain time frame due to the following reasons. The history of macroeconomic and financial data on reserves, foreign exchange rates, inflation and equity indices does not date back to the 1980s for most countries. The impact, if any, of economic policies of populist parties does not materialize immediately but might require an unknown period of time before it disseminates to markets. In their first study, Dornbusch & Edwards (1989) compare snapshots[22] of macroeconomic data at year one to data at the fourth year of the

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[22]In particular, Dornbusch and Edwards (1989) observe data for unemployment, foreign exchange rates, inflation and foreign currency reserves and calculate the difference between the date of inauguration of a populist party and the end of their respective legislative period to capture the economic effect. While we consider this method as effective we suggest that the economic consequences of these parties can be observed more precisely through the quantification of populism. Also, Dornbusch and Edwards (1989) focused on a very small number of countries only, which were well known for extreme political styles. To name two, Chile's and Peru's economic and political systems have been and still are much more fragile and exposed to political shocks than most advanced European economies we consider in our data set.

populist regime's period of governance (Dornbusch & Edwards, 1989). However, they do not explicitly specify the duration of the four phases of populism. In our approach we isolate election results ranging from the years 2000 to 2013 such that sufficient history of financial data pre and post the populist period for each country is observable. Furthermore, we observe the potential impact of populist parties on the economy over three different time horizons ranging from 0 to 2 years, 0 to 4 years and 0 to 6 years where 0 represents the election date of a specific country. Given the different election dates across the countries in our data set we calculate the future cut off date for every given observation period individually for every country and election such that returns from the macroeconomic variables used measure the change between the date of election and the respective cut off date after 2, 4 and 6 years from that election date. This allows us to link election results to future returns of macroeconomic data on an election level across countries in Europe.

With regards to the initial time period of the election database ranging from 2000 to 2015 the longest observation period of 6 years cannot be observed today as the future cut off date lies outside our data availability. Hence, we are required to set the youngest election equal to December 2013 so that financial data such as inflation, which is measured annually can be observed in December 2019, six years after the election. This leaves us with a data set covering election results for Europe from January 2000 to December 2013.

Furthermore, considering growing economic and financial integration we exclude countries from the Eurozone. Clearly, because countries within the Eurozone cannot be compared on a foreign exchange level and because risk sharing has been promoted within EMU countries so that the financial impact of political and economic shocks is dampened (Kose, Prasad, & Terrones, 2009). In addition sovereign credit risk of EMU countries has been converging over the last decade thereby mitigating the potential effects of national economic policies on domestic financial markets (Codogno, Favero, & Missale, 2003).

Thirdly, we set a threshold for the share of votes reached in every parliamentary election. This builds upon the logic that only with a certain level of voter support and legislative scope for action the party is equipped with sufficient penetrating power to influence macroeconomic and financial variables through its economic policies. We set this threshold to 25%. Given the high concentration of votes at a small number of parties in some countries such as Turkey or Hungary where two-thirds of the votes do often go to two different parties only, our selection process, in some cases, returns two parties for the same election dates which in turn leads to two different ERA values. This however would imply a controversial or misleading relationship between the populist indicator and the return of macroeconomic variables for the same year and country. In order to circumvent this problem we only consider the highest ERA party for each year and election and remove the lower ones.

In addition, we focus on elections of national parliaments only and do not consider elections of the European parliament due to the fact that policies introduced by the European parliament cannot be directly linked to the economic development of individual nations. Lastly, we calculate the average of the left- to right-wing indicator and the liberty- to authoritarian indicator to arrive at the right-wing authoritarian index which is multiplied by the percentage amount of votes won at an election to account for the political power of the respective party in a particular period of governance. This process finally returns the *Effective Right-wing Authoritarian Index* or simply the *ERA*.

Hence, the impact such populist parties can have on the development of a country's macroeconomic stability should be much larger for the Latin American countries during the late 1980's.

3.3 Summary statistics

This section provides an overview of the data and variables used for the empirical analysis in Section 4. As described in earlier, we retrieve two data sets from *parlgov.org* containing statistics on election results and party characteristics. We merge the datasets through a unique party identifier to build a comprehensive database that allows us to link political information to economic variables. Table 1 shows results of national parliamentary elections for 37 countries across Europe, Canada and Australasia for the period between 2000 and 2015. While the original data set dates back to 1900 for some countries we cut off the data at 2000 due to the following reasons.

The geopolitical landscape has changed dramatically over the last 100 to 125 years and is not representative for a comparison with today's indicators for certain ideologies. Secondly, the indicators developed by Benoit and Laver (2006) are calibrated to the societal perception of politics in the the 21st century rather then beginning of the 20st (Benoit & Laver, 2006) and thirdly, because availability of macroeconomic data is limited. We list countries in a chronological order and calculate the number of elections for each country and their respective maximum and average ERA values across elections. Out of the 37 countries presented, 20 are members of the Eurozone and therefore have the EUR as their official currency. With 11 national parliament elections between 1990 and 2013, Greece has the highest number of elections followed by Australia and Latvia with 9 elections each.

Looking at the ERA indicator the highest value of 5.11 has been reached by Turkey's Justice and Development Party, or originally AKP, led by Recep Tayyip Erdoğan in November 2002. To put this in context 5.11 is about 10 times the average ERA value of the sample from 1990 to 2015. The second and third highest ERA values are observed in Japan during their elections in 2005 and 2012 with 4.9 and 4.8 respectively which is about 1.5 times the average maximum value of the 37 countries.

At this point we need to recall that the ERA is not only a combination of the Huber Inglehart (1995), Benoit Laver (2006) and CHES (2010) left- to right-wing and the liberty to authority scale but does also consider the parties penetration power through the percentage amounts of seats reached in a particular parliamentary election(Huber & Inglehart, 1995), (Benoit & Laver, 2006). These selection criteria remove parties such as the National Democratic Party (NPD) in Germany or the Hungarian Justice and Life Party (MIÉP), which are both located at the very top right corner of our political ideology diagram in Figure 1 but do not have the legislative and executive power in national politics to impact the macroeconomic situation of their home countries due to their low number of seats taken in the respective national parliaments.

As described throughout the introduction of this paper the main challenge of this research appears to be the quantification of qualitative information such that the concept of the localization of political ideologies can be observed in an economic framework. In order to construct a dataset that can be linked to economic variables and observe a potential cause and effect relationship between politics and macroeconomics we apply the party selection process described in section 3.2 to the data presented in Table 1. This leaves us with a sample of 13 countries and 42 parliamentary elections between 2000 and 2013, which is demonstrated by Table 2. While the highest ERA country remains Turkey, Japan has been replaced by Hungary and Bulgaria with the second and third highest values respectively. The lowest ERA values have been observed by the Scandinavian countries Norway, Sweden and Denmark. These countries do have parties that are identified as populist,

Table 1: Summary statistics

Table 1 covers elections of national parliaments as well as elections of the European parliament for each country for the years ranging from 1990 to 2015. Data is originally retrieved from *parlgov.org* via the merge of the election and party datasets which returns a comprehensive list of election results covering 37 countries across Europe, Canada and Australasia. Columns 2,3 and 4 provide an overview of political and monetary belonging and column 5 shows the currency of the respective country. The last three columns list the number of elections taken place in each country within that period, the maximum ERA value achieved per election and country, and the average ERA across all elections for each country respectively.

Country	EU Member	Europe	EZ Member[23]	Currency	Elections	Max ERA	$\overline{ERA}$
Australia	N	N	N	AUD	9	3.64	0.72
Austria	Y	Y	Y	EUR	8	3.04	0.89
Belgium	Y	Y	Y	EUR	7	1.39	0.41
Bulgaria	Y	Y	Y	BGN	8	3.48	0.60
Canada	N	N	N	CAD	8	4.78	0.85
Croatia	Y	Y	N	HRK	5	3.05	0.30
Cyprus	Y	Y	Y	EUR	5	2.44	0.73
Czech Republic	Y	Y	N	CZK	8	3.02	0.46
Denmark	Y	Y	N	DKK	8	1.92	0.37
Estonia	Y	Y	Y	EUR	7	2.18	0.63
Finland	Y	Y	Y	EUR	7	1.79	0.50
France	Y	Y	Y	EUR	5	4.53	0.39
Germany	Y	Y	Y	EUR	7	2.67	0.63
Greece	Y	Y	Y	EUR	11	3.71	0.66
Hungary	Y	Y	N	HUF	7	4.14	0.58
Iceland	N	Y	N	ISK	7	2.38	0.59
Ireland	Y	Y	Y	EUR	5	3.19	0.59
Israel	N	N	N	ILS	8	2.01	0.38
Italy	Y	Y	Y	EUR	7	3.15	0.32
Japan	N	N	N	JPY	9	4.87	0.67
Latvia	Y	Y	Y	EUR	9	2.38	0.59
Lithuania	Y	Y	Y	EUR	7	3.73	0.35
Luxembourg	Y	Y	Y	EUR	5	3.02	0.66
Malta	Y	Y	Y	EUR	6	3.40	1.93
Netherlands	Y	Y	Y	EUR	7	1.85	0.44
New Zealand	N	N	N	NZD	9	4.74	0.65
Norway	N	Y	N	NOK	6	1.73	0.55
Poland	Y	Y	N	PLN	8	4.07	0.43
Portugal	Y	Y	Y	EUR	8	3.91	0.69
Romania	N	Y	N	RON	7	3.11	0.39
Slovakia	Y	Y	Y	EUR	8	2.67	0.47
Slovenia	Y	Y	Y	EUR	8	2.22	0.37
Spain	Y	Y	Y	EUR	7	4.09	0.43
Sweden	Y	Y	N	SEK	7	2.08	0.61
Switzerland	N	Y	N	CHF	7	2.55	0.32
Turkey	N	Y	N	TRY	8	5.11	0.83
United Kingdom	Y	Y	N	GBP	6	3.77	0.45
Maximum					11	5.11	1.93
Minimum					5	1.39	0.30
Average					7	3.13	0.58

however find relatively weak voter support which in turn results in lower overall ERA values. When comparing the final data set presented by Table 2 to the initial list of countries shown by Table 1 it appears that the ERA values have increased dramatically. While the maximum ERA indicator remains at 5.11 the highest ERA value within the averages in the last column has increased by more than 150% from 1.93 to 4.84 with the average Max ERA being lower. Furthermore, the average ERA has almost quadrupled from 0.58 to 2.18.

Clearly, at this point we need to remember that the selection process excludes parties that achieve less than the minimum of 25% of the seats in a certain parliamentary election, which technically leads to higher values. Nevertheless, the average ERA value is still considerably higher after running the data through the party selection process. Finally, considering all election results irrespective of the 25% limit clearly supports the hypothesis by Heinö (2016) that Europe has experienced growing support for populist parties in the 21st century.

Table 2: Final dataset after application of the party selection process

Table 2 reports the list of countries achieved after application of the party selection process described above. Election results from these countries within the time period from 2000 to 2013 will be considered in the empirical analysis. Columns 2,3 and 4 provide an overview of political and monetary belonging and column 5 shows the currency of the respective country. The last three columns list the number of elections taken place in each country within that period, the maximum ERA value achieved per election and country, and the average ERA across all elections for each country respectively.

Country	EU Member	Europe	EZ Member	Currency	Elections	Max ERA	$\overline{ERA}$
Bulgaria	Y	Y	N	BGN	3	3.48	2.47
Croatia	Y	Y	N	HRK	4	3.05	2.34
Czech Republic	Y	Y	N	CZK	3	2.30	1.53
Denmark	Y	Y	N	DKK	4	1.92	1.72
Hungary	Y	Y	N	HUF	3	4.14	2.41
Iceland	N	Y	N	ISK	2	2.29	1.55
Norway	N	Y	N	NOK	3	1.15	1.01
Poland	Y	Y	N	PLN	4	2.69	2.05
Romania	Y	Y	N	RON	4	2.14	1.84
Sweden	Y	Y	N	SEK	3	1.63	1.45
Switzerland	N	Y	N	CHF	3	2.43	2.24
Turkey	N	Y	N	TRY	3	5.11	4.84
United Kingdom	Y	Y	N	GBP	3	3.45	2.84
Maximum					4	5.11	4.84
Minimum					2	1.15	1.01
Average					3	2.75	2.18

4 Empirical analysis

This section presents the empirical strategy used to detect a potential correlation between populism and subsequent returns of macroeconomic variables over time based on the data retrieved from the party selection process.

We want to recall, that the theoretical framework defined here is not designed to test the hypotheses[24] made by Dornbusch & Edwards (1989) and (1991) but rather as an approach to endeavour the investigation of a potential cause and effect relationship between politics and macroeconomics in general (Dornbusch & Edwards, 1991). Moreover, we do not aim to analyse the evolution of the four phases of populism as outlined by Dornbusch & Ewards (1991) but define a conceptual setting motivated by their preceding work to test whether the consequences are time dependent and vary between developed and emerging markets.

The general question we want to address is whether the Effective Right-wing Authoritarian index is negatively correlated with subsequent returns of macroeconomic data such as reserves, foreign exchange rates and equity indices and positively correlated with future returns of inflation. Secondly, if there is any significant relationship between these variables and the ERA, what is the incubation period and is there a time structure that is observable across countries and elections.

At this point we also want to highlight that we focus on the European continent whereas Dornbusch & Edwards (1989) observed the consequences of populism of Latin American countries. This is crucial as the political systems and the cultural foundation they are based on differ greatly between Europe and Latin America. Consequently, it may be the case that the reaction, if any, of European economies diverges substantially from the one observed in Latin America[25]. Compared to modern European economies the economic stability of Latin American countries from the 70's are rather fragile and therefore might be less resilient against dramatic political changes.

To consider structural differences between countries we will test the panel data for fixed effects via the Hausman Test and in a next step split the countries included in our data into two groups. In particular, we calculate the median of the per capita GDP of all countries and gather the countries below and above the median to two isolated groups. We define the group of countries with below median per capita GDP as Emerging Market (EM) and the countries with above median per capita GDP as Developed Markets (DM). While this separation is not consistent with the official definition by the International Monetary Fund (IMF) it allows us to segregate the countries in an effective way.

In particular we test the hypotheses derived in section 2 with the statistical models outlined in the section 4.1. We then address the Hypotheses 1 to 6 systematically and discuss the findings and the potential economic intuition that could drive them.

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[24]The hypotheses of Dornbusch and Edwards (1989) and (1991) we refer to are not specified explicitly in their study, however are summarized in section 1 and Equation 1 of this paper in detail. In brief, they state that populist parties seek to improve the country's economic situation through short-sighted economic policies that borrow from the future. These policies, supported by the run-down of currency reserves and monetary expansion lead to an overheating economy and a dramatic increase in inflation, which in turn causes the currency to fall and unemployment to rise. This also affects stock prices given the interconnectedness of financial assets both on a national and international level. The transmission mechanisms we postulate for the individual macro-variables are described in sections 2 and 5

[25]We also want highlight that the institutional quality of any individual country and the systemic or financial soundness could mitigate the economic consequences of populism (Erb et al., 1996).

4.1   Conceptual framework

In order to test the hypotheses defined in section 2 we define regressions that shall measure the relationship between the ERA and the selected macro variables. Before we start our regression analysis we will perform a set of statistical tests that help us characterize the data and specify the appropriate regression models.

The basic dataset we are going to use consists of simple time series for reserves, foreign exchange rates, inflation and cash prices of stock indices. We run an Augmented Dickey-Fuller unit root test and accept the null hypothesis that the series have a unit root for all variables. The only stationary time series is inflation as it is defined as the annual percentage change. Given we aim to observe the effect of the ERA on the development of the selected macroeconomic variables we build returns over three different time horizons. 2, 4 and 6 years. To avoid producing spurious regressions we perform panel unit root tests with individual intercepts and automatic lag selection using the Schwarz Info Criterion. The test results are all insignificant in level and show that our panel data are first order integrated.

As discussed extensively throughout the sections above we do assume that today's levels of the ERA might effect future returns of macroeconomic metrics. However, it might be the case that they are cross correlated or that past returns of the selected variables affect today's ERA levels. Consequently, we run Granger Causality Tests between the ERA and all of the four return series individually over the 3 different time horizons. The test statistics are presented in the Appendix by Table 7. We find that the ERA Granger causes 2 and 4 year foreign exchange returns. These findings however cannot be confirmed for the remaining variables and time horizons as the test statistics are insignificant for both, the ERA Granger causing future returns of macro data and future returns Granger casuing levels of ERA. Nevertheless, and as outlined in Section 2 we specifically designed our research framework to investigate a potential correlation between the ERA and the future development of the selected macroeconomic key measures with the ERA being the independent variable in the regressions.

The ERA by definition is a numerical value which varies between 0 and 10. High values identify parties categorized as right-wing populist as explained throughout the discussions in sections 2 to 3. The ERA will be the independent variable in our regression analysis. Given all of the 13 countries in our final data set had multiple elections from 2000 to 2013 as shown in Table 2 the total number of elections equals to 42, which leaves us with the same amount of observations for the ERA value.

The dependent variables in the model are defined as returns of reserves (RV), foreign exchange rates (FX), inflation (CPI) and stock indices (EQ) over 3 different time periods. 2, 4 and 6 years. This time variation in returns should allow potential effects of populist policies to channel through to financial markets and finally impact macroeconomics. Given the data frequency varies in the independent variables we are forced to set individual cut off dates for the calculation of the return periods. Foreign exchange rates and cash prices of equity indices are available on a daily basis and can therefore be directly linked to the date of any election, with the exception of weekends or bank holidays where these financial instruments are not traded on the exchanges. To circumvent these days we simply define the first business day following an election as the cutoff date for the calculation of returns. For foreign exchange rates and equity indices this gives the returns between the election date and a future business day exactly after 2, 4 and 6 years. For the less frequent variables, inflation and reserves we apply a similar logic. We measure the inflation rate as CPI in the month of any election in our dataset and calculate the return between this

month and the future month after precisely 2, 4 and 6 years. Reserves are only published annually and therefore do not allow for a precise cutoff date at the day, week or month of election. We calculate returns of reserves as the difference between the value in the year of the election and the future value after 2,4 and 6 years from that year. This method leaves us with 3 individual data panels for every macroeconomic variable and 3 groups of countries[26] resulting in a total of 36 panels to perform our regressions on.

Considering the structure of our data we also test whether to include country fixed effects in our regressions rather than using pooled regressions. Therefore, we run a series of regressions with the ERA as the independent variable using random effects and then apply the Hausman Test. The p-values do not allow to reject the null hypothesis that the cross-section is random for any of the variables and time horizons. Hence, we estimate the regressions below using random effect specifications. We will use fixed effects for some of the regressions of the robustness checks below.

We address Hypotheses 1 to 4 through a set of uni-variate times series regressions using random effects for every macroeconomic variable and time horizon. As a next step we plot the returns of the dependent variables against the respective ERA value for every election and observation period defined. Hypothesis 5 will be tested by the observation of the evolution of the ERA coefficients throughout the different time horizons. Lastly, we form groups for high and low GDP per capita countries and re-run regressions 2 to 5 for both groups to evaluate Hypothesis 6.

4.2 The ERA and returns of macro-variables

This section systematically addresses the hypotheses as outlined in section 3 and presents the results in a statistical and economic context. We do not only want to test any potential relationship between the ERA indicator and returns of selected macroeconomic variables but also aim to elaborate on the different transmission channels of populist policies. In particular, we discuss the economic intuition behind the effect certain governments had on their country's economic stability[27] and link it to our results and previous research.

We will first question the relationship of the ERA with the selected macro-variables and present our results both statistically and graphically. While earlier studies found that political uncertainty can have an immediate impact on stock prices, we follow the approach of Dornbusch and Edwards (1989) and define different time horizons to allow for a transmission period of the effect of political changes on macroeconomics (Pastor & Veronesi, 2012).

We regress the ERA indicator, which varies between 0.79, the minimum ERA value in the data set and 5.11, which represents the maximum value against returns of reserves, foreign exchange rates, inflation and cash prices of equity indices over a 2, 4 and 6 year time period. We specify the regressions 2 to 4 below where the independent variable, the ERA represents the Effective Right-wing Authoritarian indicator at the date of a certain election. We define this variable as ERA_{t0}. The time varying return of the cross foreign exchange rate quoted against the USD for the respective country is defined as $\frac{FX_{t+i}}{FX_{t0}} - 1$ for the period between t_0, the date, month or year of the election and year $t+i$, the future

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[26]The three country groups are: All countries, Developed Markets and Emerging Markets. Countries are divided by their average per capital GDP. If a country's average per capita GDP, between 2000 and 2018, is below the groups median it will be considered an Emerging Market country and vice versa for Developed Market countries.

[27]Economic stability refers to the development of foreign exchange rates, equity indices, inflation and total reserves.

return cut-off date where i denotes the number of years and takes the value of 2, 4 or 6 for the respective returns over 2, 4 and 6 years. Equations 3, 4 and 5 follow the exact same logic considering equity indices (EQ), inflation (CPI) and reserves (RV).

$$\left(\frac{RV_{t+i}}{RV_{t_0}} - 1\right) = \alpha + \beta \times ERA_{t_0} \tag{2}$$

$$\left(\frac{FX_{t+i}}{FX_{t_0}} - 1\right) = \alpha + \beta \times ERA_{t_0} \tag{3}$$

$$\left(\frac{CPI_{t+i}}{CPI_{t_0}} - 1\right) = \alpha + \beta \times ERA_{t_0} \tag{4}$$

$$\left(\frac{EQ_{t+i}}{EQ_{t_0}} - 1\right) = \alpha + \beta \times ERA_{t_0} \tag{5}$$

We will also break down our data set into two further country subgroups, Developed Market and Emerging Markets. Consequently, we run a total of 36 uni-variate time series regressions and estimate the coefficient β for the ERA to observe the correlation with the returns of every macroeconomic variable over 3 horizons. At this point we want to mention that we do not expect the explanatory value of the independent variables measured through R^2 to be considerably high considering the aim of these regressions is to solely investigate correlations with the ERA rather than to explain the ERA through the variation of macroeconomic metrics. The regression outputs are presented in Table 3 below.

Following the logic of Dornbusch & Edwards (1989) we should observe a fall in reserves and foreign exchange rates and a spike in inflation as a consequence of populism or more specific as a consequence of economic policies introduced by populist governments. Given stock indices have not been observed by Dornbusch and Edwards (1989) or other research in this particular context we rely on the quoted papers and the discussion from section 2. We learned from previous studies about the effects of political events on stock prices that stock price volatility tends to increase around elections (Pastor & Veronesi, 2012). In addition, increased country risk can produce negative stock returns and a move to autarky positively impacted stock market capitalization in the U.S. (Erb et al., 1996) and (Pastor & Veronesi, 2018). Ultimately, any relationships between the ERA and the returns of selected macro-variables can only be seen in the data if the ERA is able to identify such populist parties, which, given the ambiguity around the definition of populism and the

challenge to capture and quantify this ideology through an indicator might not be directly compared with the work by Dornbusch & Edwards (1989) and (1991).

5   Results and interpretation

Let us recall Hypotheses 1 and 2, which state that there is a negative relationship between the ERA and subsequent returns of reserves and foreign exchange rates. Considering the regression outputs for the group, All Countries (AC), from Table 3 we find that 6 out of 6 regression coefficients are negative for RV and FX, yet only foreign exchange rates show statistically significant results. The negative correlation between the ERA and FX can be confirmed for all country groups and time horizons but is only significant for 6 year returns in the groups AC and EM. For Emerging Markets (EM) 5 out of the 6 coefficients for RV and FX remain negative with only the 4 year RV coefficient switching to positive. Interestingly, the magnitude of the coefficient for 6 year foreign exchange returns in group EM increases versus AC, with its p-value becoming smaller at the same time. On average, an increase in the ERA of 1% leads to a decrease in 6 year foreign exchange rates, quoted against the USD, of 10.56% for the AC group and 12.01% for the EM group. While only FX shows statistically relevant results the correlations between the ERA and RV, and the ERA and FX is consistent with previous research. The results support the arguments made by Dornbusch & Edwards (1991) that the temporary increase in economic output was found to be financed via monetary expansion and the run-down of foreign exchange reserves. Both creates an oversupply of the national currency and thereby downward pressure on the foreign exchange rate as demonstrated by Venezuela under Hugo Chávez. Moreover, it is in line with Equation 1 and the four phases which state that effect of populism becomes stronger over time (Dornbusch & Edwards, 1989) and (Erb et al., 1996). We therefore accept hypothesis 1 for the two groups AC and EM and reject it for the DM subgroup. Given the coefficients for ERA in the regressions for RV are insignificant throughout all country groups and time horizons we reject Hypothesis 2 for all groups and return periods.

If the ERA indicator justifies for identifying populism then we should find a strong positive relationship between the ERA and changes in inflation. As explained above, the often introduced increase in real wages by populist parties and the concurrent monetary expansion drive inflation and once in a recession the monetary system overheats as a consequence of reduced output and high values of money supply leading to a drastic spike in inflation[28](Aghevli, 1977). Results for Inflation (CPI) however, are rather mixed and not consistent with previous studies. We do not find any evidence of a systematic pattern of an increase or decrease in inflation as a consequence of populism. According to Dornbusch & Edwards (1989) populism should lead to a spike in inflation, however we can only find a slight positive relationship between the ERA and CPI for the 2 and 4 year periods in AC and for the 2 year periods for the groups DM and EM. Our results do not allow to conclude that higher ERA values have a positive impact on CPI. Consequently, we reject

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[28]The concept of inflation clearly is is not as simple as summarized here. However, in the context of this research we want to highlight that aggressive overexpansion through increased money supply can lead to inflationary pressures (Roffia & Zaghini, 2007). At this point, we also want to remark that despite monetary easing in most of the advanced economies after the global financial crisis following the Lehman collapse, the post crisis period until today has been a relatively low inflation period, which goes against the hypotheses made by Dornbusch & Edwards (1991) and makes the interpretation of our results more complex.

Table 3: Univariate panel data regressions

Table 3 presents the regression outputs from Equations 2 to 4. We run the regressions for three different time periods for each variable and then breakdown the data set into two additional subcategories. The groups are defined as All countries, Developed Markets and Emerging Markets. Consequently the total number of regressions is 36. The dependent variable is the return of the respective macroeconomic indicator over 2, 4 and 6 years. The ERA defines the independent variable affecting subsequent returns of reserves, foreign exchange rates, inflation and equity indices. Columns 2 to 4 report the coefficients found for β, its statistical significance through the p-value and the achieved $t-statistic$ for each of the of macro-variables.

	Reserves	FX	Inflation	Equity
All countries (Independent variable: ERA_{t0})				
2 year	-0.0749	-0.0434	0.0166	0.0588
p-value	0.2041	0.1039	0.8909	0.5104
t-statistic	-1.2909	-1.6642	0.1380	0.6642
4 year	-0.0131	-0.0569	0.0361	0.0982
p-value	0.9248	0.1022	0.8188	0.5926
t-statistic	-0.0950	-1.6726	0.2306	0.5394
6 year	-0.0271	-0.1056**	-0.0275	-0.0782
p-value	0.9128	0.0464	0.8196	0.8465
t-statistic	-0.1102	-2.0557	-0.2296	-0.1948
Developed markets (Independent variable: ERA_{t0})				
2 year	-0.0679	-0.0270	0.1373	0.0564
p-value	0.6470	0.6671	0.6909	0.7347
t-statistic	-0.4653	-0.4369	0.4038	0.3440
4 year	0.2876	-0.0370	-0.1345	-0.1419
p-value	0.3117	0.6489	0.7695	0.5906
t-statistic	1.0393	-0.4626	-0.2972	-0.5472
6 year	0.3580	-0.0379	0.0192	-0.3914
p-value	0.4439	0.7767	0.9536	0.2707
t-statistic	0.7820	-0.2877	0.0590	-1.1345
Emerging markets (Independent variable: ERA_{t0})				
2 year	-0.0989	-0.0485	0.0131	0.0271
p-value	0.1707	0.1595	0.9054	0.8419
t-statistic	-1.4238	-1.4643	0.1204	0.2022
4 year	0.1840	-0.0370	-0.1345	-0.1419
p-value	0.3117	0.6489	0.7695	0.5906
t-statistic	1.0393	-0.4626	-0.2972	-0.5472
6 year	-0.2541	-0.1201**	-0.0057	-0.2846
p-value	0.5003	0.0430	0.9617	0.6819
t-statistic	-0.6872	-2.1687	-0.0487	-0.4162

The sample period covers macroeconomic data between 2000-2018.
*** (**) (*) denotes level of significance at the 1% (5%) (10%) level.

Hypothesis 3 for all three country groups and return periods.

Our empirical evidence for returns of equity indices is also weak as all coefficients are insignificant. For the group covering all countries the ERA is positively correlated with EQ over 2 and 4 years and negatively over 6 years. For both, DM and EM, we find that the ERA has a negative impact on EQ for the 4 and 6 year returns but with insignificant p-values for all coefficients. Hence, we reject hypothesis 4, for all three groups, AC, DM and EM and all time horizons of returns. While the statistical method for testing the relationship follows the same rationale as for the other macroeconomic variables, the interpretation of returns of equity indices requires a different approach due to the following reasons. Equity indices are constructed from single stocks of companies that are listed on the respective national stock exchanges and weighted based on their market capitalization. Consequently, by construction, our equity index variable is the only metric on a corporate level. Hence, it cannot be considered a pure macroeconomic measure like foreign exchange rates, inflation or reserves. Moreover, the price development of stocks, according to classical corporate finance theory, is driven by the current and future profitability of a company and its ability to pay out dividends to shareholders (Gordon, 1959). Therefore, returns of equity indices should not be primarily driven by macroeconomic variables or new economic policies but rather by equity investors' believes about the future profitability of the firms included in the index. However, to isolate the price formation process of stocks, and especially on an aggregate level such as indices, might be shortsighted. Any company's ability to operate profitably is to some degree also depended on the country's laws, regulations and the economic environment it operates in and is thereby exposed to the country's political system. To summarize, the development of equity prices might also be affected by the country's risk, in which these firms operate in (Erb et al., 1996).

A recent example supporting this rationale is U.S. president Trump's introduction of the Tax Cuts and Jobs Act (TCJA) from 2017. Most importantly, the TCJA reduced the U.S. corporate tax rate to 21% from its initial relatively high level of 35%. The imminent positive impact on stock prices and therefore returns on equity indices in the U.S. is rather obvious. In particular, research found that the TCJA played a crucial role in the U.S. stock market rally since the election of Donald Trump (Wagner, Zeckhauser, & Ziegler, 2018). While the economic intuition behind a potential correlation between the ERA and subsequent returns of stock index prices can be explained, our empirical analysis does not show any significant results. Consequently, we also reject Hypothesis 4.

The differences in the coefficients between the country groups overall are not consistent across the macro-variables and country groups with the exception of FX. We find that there is a statistically significant correlation between the ERA and 6 year foreign exchange returns in the AC and EM country groups but not in the DM group. Let us recall that all countries from the study conducted by Dornbusch & Edwards (1989) belong to the Emerging Market sector, according to both MSCI and the IMF, which supports our findings for FX in the Emerging Market countries. However, before we can draw a conclusion from these findings we want to highlight that Figure 3 suggests that our results might be driven by Turkey in particular. Furthermore, the correlation between the ERA and FX is only significant over the 6 year period for the groups AC and EM. Given EM is a part of AC, as all Emerging Market countries are included in the AC group as well, our results for FX in the AC group are not only driven by EM but might be affected by Turkey in particular. We will address this problem and Hypothesis 5 in section 5.2.

To address Hypothesis 6, which states that the correlation between the ERA and sub-

sequent returns of reserves, foreign exchange rates, equity indices and inflation are time dependent we calculate the changes in β for ERA from Equations 2 to 5 between the 3 time horizons. If the effect of the ERA increases over time as it materializes in financial markets and macroeconomics we should observe a gradual decrease in β for ERA in absolute terms, for the regressions with RV, FX and EQ. As we postulate a positive correlation between the ERA and CPI we expect a rise in β for ERA over time when regressing it against CPI. Table 4 shows that no correlation coefficient for the ERA consistently moves towards one direction for any of the return variables. However the coefficients for ERA in the FX column become more negative in 5 out of six cases. Only the change between the coefficients for 2 to 4 years increased in the EM group. Similarly, we observe an increase in the negative correlation between the ERA and EQ in all cases, with the exception of the 2 to 4 year change in the group covering all countries. The variation in the ERA coefficients for RV and CPI do not show any systematic changes. While there is some evidence that points towards a time dependency of the correlations, all coefficients in Table 3 are insignificant. Hence, we reject Hypothesis 6 for all country groups.

To summarize, our results show that there is some evidence for a negative correlation between the ERA and future returns of foreign exchange rates, which is persistent across the 2, 4 and 6 year return calculation periods but only statistically significant for 6 year returns in the AC and DM country groups. While all coefficients for ERA show negative signs, Table 4 makes clear that the correlation is not gradually increasing throughout the different time periods[29]. Clearly, the results presented here and the implications we derive from them do not necessarily showcase an uncontroversial relationship with an obvious economic intuition, but show that there is some support of prior studies dealing with economic effects of politics or populism (Dornbusch & Edwards, 1989).

5.1 The ERA and foreign exchange rates

Regressing the ERA against subsequent returns of foreign exchange rates allowed us to detect a potential economic relevance carried by the ERA. While most dependent variables do not show a clear relationship with the ERA, returns of foreign exchange rates appear to be consistently negatively correlated with the ERA indicator. Moreover, the effect appears to be weaker over the shorter 2 year time period of returns and increases slightly with the extension of the observation period. This is consistent with the economic explanation by Dornbusch & Edwards (1991) where the medium to long term effects of populism on the countries' foreign exchange rate stem from an overexpansion of the economy through accelerated monetary support via the central bank[30] (Dornbusch & Edwards, 1991). The short to medium term effects of political and election related information on future foreign exchange rates have also been investigated by Blomberg and Hess (1997), who showed

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[29]Dornbusch and Edwwards (1989) and (1991) explain the macroeconomic consequences of populism in Latin America as a process that is subdivided into four different phases. During these phases the effects of populism on the economy worsen with the extension of time. Analogously, we should be able to observe an intensification of the correlation between the ERA and the returns of macro-variables. If this is also true for our dataset, then all changes in ERA shown by 4 should be negative for RV, FX and EQ but positive for CPI.

[30]Given the nature of financial markets is not purely rational and the various mechanisms that drive prices, such a relationship, even if statistically significant, cannot be completely isolated. Overexpansion through quantitative easing creates an artificial money supply surplus that exceeds the demand side thereby, in theory, driving up prices and inflation, and at the same time leaving the currency to weaken. The interconnectedness of these two variables obviously could cause the problem of multicollinearity. However, given we isloate the returns for every macro-variable we circumvent this problem beforehand.

Table 4: Time dependency of ERA coefficients

Table 4 presents the changes in β for ERA from Equations 2 to 5 between the 3 different time horizons. The changes are defined as the difference between the coefficient for the 2 and 4 year period and the difference between the coefficient for the 4 and 6 year period. The changes give some insight about the development of the correlation coefficients shown by Table 3. Table 4 also provides some information in relation to Hypothesis 6.

	Reserves	FX	Inflation	Equity
Change in coefficients for ERA: All countries				
2 to 4 year change	0.0618	-0.0135	0.0195	0.0394
4 to 6 year change	-0.0140	-0.0487	-0.0637	-0.1763
Change in coefficients for ERA: Developed Markets				
2 to 4 year change	0.3555	-0.0100	-0.2718	-0.1983
4 to 6 year change	0.0704	-0.0009	0.1536	-0.2494
Change in coefficients for ERA: Emerging Markets				
2 to 4 year change	0.2829	0.0115	-0.1475	-0.1691
4 to 6 year change	-0.4381	-0.0831	0.1288	-0.1426

that the inclusion of party-, election- and candidate specific data improves the precision of existing forecasting models. Our economic intuition for the negative relationship between the ERA and foreign exchange rates is motivated by international demand and supply dynamics of goods and cross-border capital flows which have been found as one of the main drivers of foreign exchange rates (Lane & Milesi-Ferretti, 2007). This logic is based on the concept that effective economic policies increase domestic output growth on the one hand and attract foreign investments on the other, which promotes foreign demand of the currency that finally leads to an appreciation of the currency and vice versa. Clearly, the value of a currency is ultimately driven by demand and supply dynamics, as any other financial instrument that is traded on an exchange. However, the fundamental evaluation of a currency is more complex than outlined here and requires more sophisticated models with a broader spectrum of input factors. Therefore, the returns of foreign exchange rates we observe cannot be linked directly to the ERA (Meese & Rogoff, 1983). Moreover, the negative relationship found between foreign exchange rates and the ERA might also be a result of a general strengthening of the USD, such that the FX returns are negative regardless of the political or economic situation in any country investigated here[31]. To address this problem and test the robustness of our results for the FX variable we plot the US Dollar Index[32] below, which measures the value of the US Dollar against a basket of major currencies. Figure 2 shows that during our observation period, ranging from 2000 to 2018, the USD has devalued considerably until 2008 however, regained in

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[31] At this point we need to recall that for the calculation of foreign exchange returns we have used cross foreign exchange rates quoted against the US Dollar such that an increase in the foreign exchange rate is equal to an appreciation of the respective local currency. We used this approach for two reasons. First, because changes and coefficients in our regressions are easier to interpret and second, when comparing our results to Figure 2 it becomes clear that there has not been a general upward trend in the USD potentially supporting the negative returns we find.

[32] The USD Index is comprised of the average of the USD foreign exchange rate quoted against the Euro, the Japanese Yen, the British Pound, the Canadian Dollar and the Swiss Franc. By construction the index constitutes a more broadly defined valuation of the US Dollar and therefore allows us to take into account general price developments that are not specific to any foreign exchange rate in our sample.

value throughout the last decade. Since all our foreign exchange rate variables are quoted against the USD we argue that negative foreign exchange returns alongside a concurrent increase in the USD Index weakens the validity of our results. This can also be the case for positive returns with a simultaneous devaluation of the USD Index and is based on the reasoning that the change in returns of foreign exchange rates are not a result of populism (ERA) but rather driven by a general macroeconomic trend that is not captured by the ERA. Looking at Figure 3, we can see that in the country groups AC and EM, Turkey appears as a clear outlier and might be crucial for our results. The data labels in Figure 3 show the currency code and the year of the election at t_0. In particular the two extreme data points $TRY'07$ and $TRY'11$ represent returns of the Turkish Lira from 2007 to 2012 and 2011 to 2017 respectively. For the first period, the USD Index has remained broadly unchanged. However between 2011 and 2017 it has appreciated against major currencies excluding the Turkish Lira, which might cause the TRY/USD exchange rate to fall regardless of the ERA. Nevertheless, we can clearly see from Figure 3 that high ERA countries tend to have negative foreign exchange returns irrespective of the period and election year. The described correlation of the ERA with foreign exchange returns can be seen by the negative slope of the red lines as an equivalent to the estimations of β from Equations 2 to 5. Also the charts show that the extreme values on the bottom-right hand corner are consistently represented by Turkey, Hungary, the UK and Bulgaria. All four governments of these countries have been led by parties, which at the time of election have been described as populist by the media and political experts. Particularly, the election and re-election of Recep Tayyip Erdoğan and his conservative right-wing AKP, Viktor Orbán through Fidesz in Hungary, the rise of UK's UKIP under Nigel Farage, most prominently for their Brexit campaign and lastly, the victory of Boyko Borisov (GERB) in Bulgaria. These results support a potential negative relationship between the ERA and subsequent returns of foreign exchange rates, and, should the ERA correctly identify populist parties, between populism and subsequent returns of foreign exchange rates.

Figure 2: The US Dollar Index

Figure 2 depicts the USD Index from January 2000 to December 2019. The USD Index reflects the value of the USD quoted against a weighted currency basket including the Euro, the Japanese Yen, the British Pound, the Canadian Dollar, the Swedish Krona and the Swiss Franc. Historical data of the USD Index is retrieved from Bloomberg.

Figure 3: 6 year foreign exchange returns vs the ERA across country groups

The three charts below show the relationship between the ERA and returns of foreign exchange rates for the 6 year time horizon and the AC, DM and EM country groups. The top visualizes All Countries, the second Developed Markets and the third chart at the bottom shows the Emerging Market countries. The horizontal and vertical axes show the ERA values and FX returns respectively.
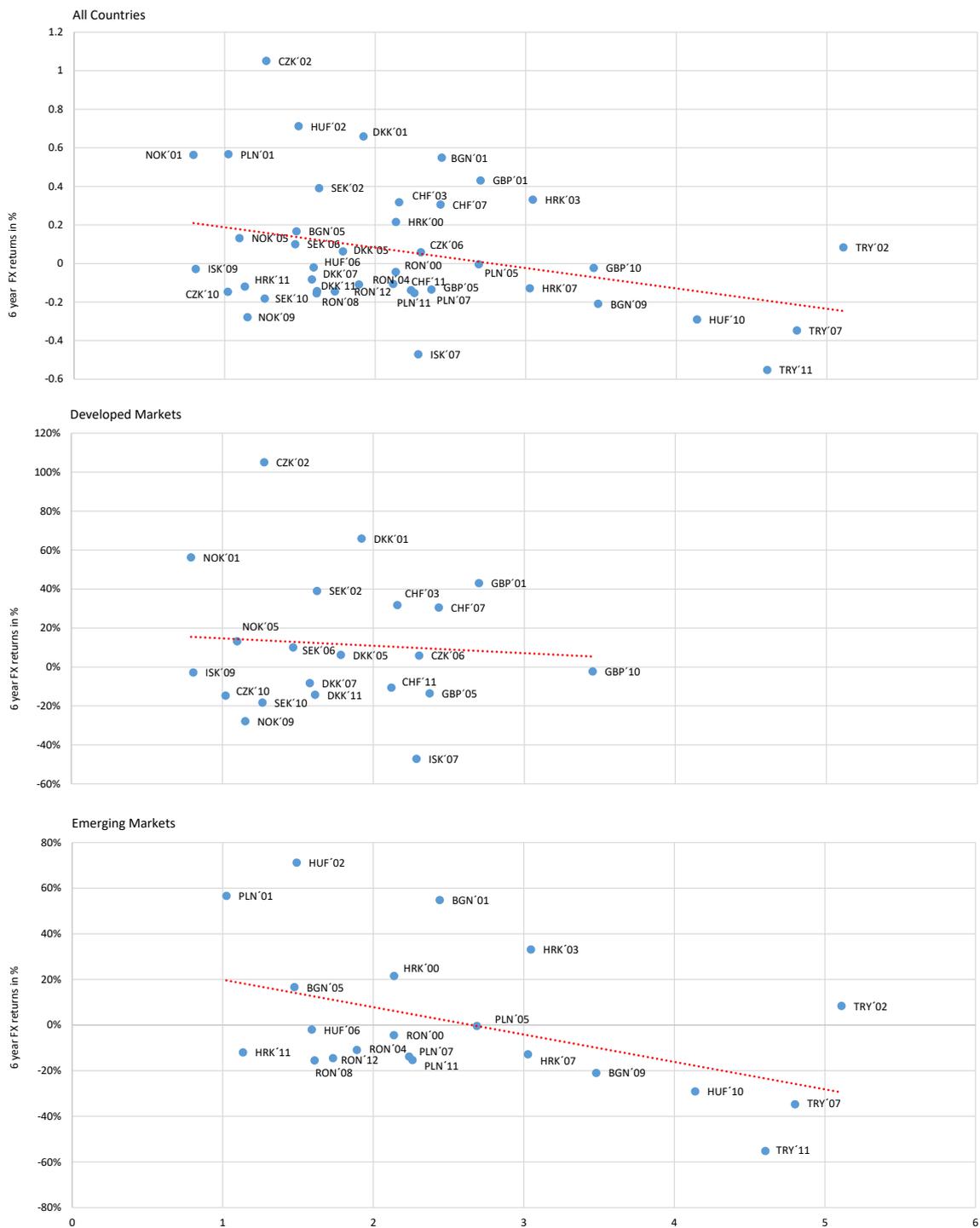
5.2 Robustness checks

The statistical tests performed throughout the sections above allow us to suggest that the ERA indicator is negatively correlated with 6 year returns of foreign exchange rates quoted against the US Dollar for the group covering All Countries and the group covering Emerging Markets. We also want to recall that we accept Hypothesis 2 for the same country groups. As discussed in Section 5 and visualized in Figure 3 it appears that the results for foreign exchange rates are driven by the outlier, Turkey. The Turkish Lira has weakened throughout all observation periods across all country groups. Clearly, from the estimated *beta* of regressions 2 to 5 we cannot conclude that the negative foreign exchange returns for Turkey are a result of the ERA but only state that the variables are negatively correlated to each other. In order to test the robustness of the correlation coefficients presented by Table 3 we exclude Turkey from our dataset and re-estimate regressions 3 to 5. For the dataset excluding Turkey the results of the Hausman Tests presented by 8 suggest to include fixed effect specifications in the regressions for 2 and 6 year foreign exchange returns. The results are presented by Table 5.

When comparing Tables 3 and 5 we can conclude the following. First, the negative correlation between the ERA and 6 year returns of foreign exchange rates remains persistent but only significant for the EM group. In the AC group no coefficient shows a significant relationship. The magnitude of *beta* for the regressions against FX has become smaller for AC but has increased throughout all time periods in the EM group. All coefficients for the RV regressions are now negative in the EM group. While Turkey clearly plays a crucial role in our correlation analysis the big picture of the macroeconomic development post populism has remained consistent with the full dataset. It also supports the findings of previous research by Dornbusch & Edwards (1989). Moreoever, the persistent negative relationship between the ERA and reserves fits well into the economic intuition behind the negative foreign exchange returns. As outlined in section 2, both the run down of reserves to finance the economic expansion and the increase of the money supply create downward pressure on the currency.

Additionally, we re-run our party selection process defined in section 3.2 such that it returns the countries with the lowest ERA values. The political ideologies with the lowest ERA values are located in the bottom-left corner of our graphical depiction of a simplified universe of political spectra shown by Figure 1. Furthermore, we need to cancel out ERA values of election dates that have been already considered in section 5[33]. The input of Table 6 covers all countries from the basic dataset of Table 1 however does not allow for a further breakdown into Developed and Emerging Markets as the number of observations for the latter are too small to perform a reliable regression analysis. In particular, 8 out of 9 countries in the inverse ERA dataset belong to our group of Developed Markets.

In order to make the regression outputs comparable with the results presented by Table 3, we need to calculate the inverse ERA indicator such that the highest ERA countries become the lowest and vice versa. This allows us to observe whether the developments of the same macroeconomic variables change their direction compared to the results from Table 3. To be more specific, if high ERA countries produce negative foreign exchange returns, low ERA countries should produce positive or less negative foreign exchange returns. Table 6 shows that when compared to the regression output in Table 3, this indeed is the

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[33]In some cases the return calculation periods overlap depending on the time difference between two elections. If an election with a low ERA value follows an election with a high ERA value such that the return calculation periods intersect, any correlation found between the ERA and returns of any macro-variables during that time would be negligible.

case. All coefficients for the ERA regressions against foreign exchange returns turned positive. As mentioned above, 8 out of the 9 countries in the dataset for the inverse ERA regressions are high GDP per capita countries, or by our definition, Developed Market countries. Hence, the countries with the lowest ERA values tend to be Developed Market countries with less powerful populist parties and less negative future foreign exchange returns. While these findings generally support Hypothesis 2, or at least provide some evidence that the opposite seems to be true when turning the model upside down, all regression coefficients in Table 6 are statistically insignificant with the exception of 6 year inflation returns.

To conclude, stress testing the model shows that the results are driven by the outlier, Turkey, however remain persistent for our Emerging Market country group when re-running the regressions excluding Turkey. The 6 year foreign exchange returns might have been also affected by external factors such as the general strengthening in the USD since 2014. Lastly, low ERA countries tend to have less negative, or more positive subsequent foreign exchange returns than high ERA countries, which reconfirms the results presented by Table 3.

Table 5: Univariate panel data regressions excluding Turkey

Table 5 shows the output of regressions 2 to 5 for the same data but excluding Turkey. The first row of every time horizon, 2, 4 and 6 years, presents the coefficients *beta* for ERA. Bold numbers indicate the fixed effect regressions.

	Reserves	**FX**	**Inflation**	**Equity**
All countries ex Turkey (Independent variable: ERA t0)				
2 year	-0.1059	-0.0431	0.1221	0.0533
p-value	0.2164	0.2362	0.4671	0.6688
t-statistic	-1.2577	-1.2042	0.7347	0.4312
4 year	0.0284	-0.0386	0.0214	0.0044
p-value	0.8880	0.4158	0.9260	0.9864
t-statistic	0.1418	-0.8230	0.0936	0.0171
6 year	0.0441	-0.0929	-0.0734	-0.1037
p-value	0.9030	0.2089	0.6718	0.8614
t-statistic	0.1227	-1.2788	-0.4271	-0.1758
Emerging markets ex Turkey (Independent variable: ERA t0)				
2 year	-0.1676	**-0.0740**	**0.0979**	0.0185
p-value	0.1675	**0.1207**	**0.5806**	0.9324
t-statistic	-1.4461	**-1.6702**	**0.5678**	0.0862
4 year	-0.2047	**-0.0667**	0.1101	-0.0973
p-value	0.5066	**0.3194**	0.6061	0.8399
t-statistic	-0.6794	**-1.0388**	0.5260	-0.2053
6 year	-0.3623	**-0.1772***	-0.0951	-0.2810
p-value	0.5738	**0.0691**	0.6103	0.8142
t-statistic	-0.5742	**-1.9966**	-0.5198	-0.2389

Bold results indicate fixed effect specifications.
(*) denotes level of significance at the (10%) level.

5.3 Limitations

To our knowledge, we are the first to construct an indicator designed to gauge populism, or more specifically a right-wing authoritarian political ideology. Considering the ambiguity around populism, not only in economics, but also in political science the indicator is calibrated to a vague definition of a political concept of a qualitative nature. For these reasons we acknowledge that the Effective Right-wing Authoritarian indicator might not be the most precise identifier for political populism but does cover some ground around the topic and allows to investigate interdisciplinary relationships through quantitative methods. The return calculation periods, 2, 4 and 6 years are defined to cover at least one legislative period of any government in the sample but do not capture short term or intraday effects on asset prices. This could be a weak point as market participants might anticipate political changes as early as at the day of an election and adjust their investment strategy accordingly. Consequently, any conclusions drawn from the results presented in this research are based on the ability of the ERA to capture populism and therefore, do not qualify to describe a direct link or causality between populism and the future development of the selected macro-variables.

The time period of election results covered by our final database includes some exceptional economic events such as the bankruptcy of Lehman Brothers in 2008, the European Debt Crisis as well as the Icelandic Financial Crisis in the years thereafter. Such events can have a significant impact on the global market sentiment and might lead to megatrends or distortions in our data that are not necessarily a consequence of populism or any other political ideology. We addressed these issues via the additional robustness tests outlined in section 5.2, however given the complexity of capital markets and the variety of drivers behind the price formation process of financial assets we cannot preclude that other economic factors, which are not covered in this paper, have had a considerable impact on our results.

5.4 Conclusion and potential implications

Populism is a vigorously debated political ideology that applies unconventional economic concepts to achieve positive short-term effects through a rejection of common financial constraints, which in some cases, most prominently in Latin America, led to socioeconomic turmoil (Kaufman & Stallings, 1991). The quantification of populism through the ERA does not allow to confirm such developments in Europe, however shows that there is a significant negative correlation between the ERA, as the measure of populism, and six year returns of foreign exchange rates for some countries. The intuition behind this relationship is consistent with modern theory about the mechanisms of financial markets and investors' believes about the future economic well-being of a certain country as a result of a newly elected party. This has been demonstrated by the more than 270% drop in Turkey's currency since 2010, despite a temporary hike in interest rates to almost 25% to counteract a potential collapse of the Lira (Taskinsoy, 2019). We observe that excluding the outlier, Turkey, from our data set weakens the explanatory power of our analysis overall and with respect to returns of foreign exchange rates. However, we can confirm that the negative relationship remains persistent. In addition, calculating the inverse ERA shows that low ERA countries on average produce less negative or even positive subsequent returns of foreign exchange rates, which supports our initial findings. The remaining macro-variables, equity index-, inflation- and reserve-returns do not point towards any significant relationship with the ERA and do neither support nor refute the

findings by Dornbusch & Ewards (1991) in their research on the economic consequences of populism in Latin America (Dornbusch & Edwards, 1991).

Irrespective of the results presented here, we consider this paper as a testimony to previous research on populism from political science and as an incentive for economists to follow our approach as the availability of numeric data on politics improves. Recent developments such as the election of Donald Trump as the U.S. president, who by all existing definitions of populism qualifies as a populist, or the authoritarian leadership style of Xi Jinping's Communist Party of China contemplate only two of many examples for further research in this area.

We conclude that for Emerging Market countries[34], populism, if correctly identified by the Effective Right-wing Authoritarian indicator, is negatively correlated with subsequent returns of foreign exchange rates, quoted against the US Dollar, over a period of six years. This negative correlation is persistent throughout all country groups and increases over time, yet it is only statistically significant and robust over 6 years.

In an interdisciplinary context, the results suggest that populists promote short-sighted economic policies that ignore budget restrictions and widely accepted economic theories[35] about the mechanisms of modern financial markets.

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[34]In our research EM countries are Bulgaria, Croatia, Hungary, Poland, Romania and Turkey and produced GDP/capita numbers below the European median, which is used as the EM criterion.

[35]Without naming certain references, the term "widely accepted economic theories" refers to monetary economics applied by central banks of advanced economies in order to reach certain targets such as price stability. In particular, changes in short term interest rates and open market operations used to impact money supply and demand dynamics. These economic principles are based on modern economic theories, which may be denied or exhausted by populist government.

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6 Appendix

Table 6: Correlations with the inverse ERA

Table 6 presents the regression outputs of Equations 2 to 5 with the inverse ERA as the independent variable. The model input data covers all countries. Data is sorted based on the selection process from Section 4 with descending ERA values.

	Reserves	FX	Inflation	Equity
2 year	-0.0632	0.0843	0.0044	-0.0051
p-value	0.5749	0.4518	0.8622	0.9869
t-statistic	-0.5882	0.7967	0.1801	-0.0170
4 year	-0.1934	0.0515	0.0155	-0.0580
p-value	0.5706	0.7114	0.2024	0.8975
t-statistic	-0.5949	0.3854	1.4065	-0.1336
6 year	0.1646	0.1662	0.0098*	-0.0629
p-value	0.4551	0.2750	0.0699	0.8649
t-statistic	0.7906	1.1841	2.1374	-0.1765

The sample period covers elections from 2000-2013
*** (**) (*) denotes level of significance at the 1% (5%) (10%) level.

Table 7: Granger Causality test statistics

Table 7 presents the p-values of the Granger Causlity tests for all country groups and macro-variables. The null hypotheses are shown in column 1.

All countries	Reserves	FX	Inflation	Equity
Null hypothesis:	Macro-variables do not Granger Cause ERA			
2 year	0.8411	0.5015	0.7924	0.4244
4 year	0.6106	0.344	0.9129	0.7846
6 year	0.7617	0.4912	0.5529	0.7867
Null hypothesis	ERA does not Granger Cause macro-variables			
2 year	0.8985	0.0020	0.6636	0.173
4 year	0.7471	0.0119	0.8737	0.7917
6 year	0.9258	0.0991	0.6636	0.2645

Developed Markets	Reserves	FX	Inflation	Equity
Null hypothesis	Macro-variables do not Granger Cause ERA			
2 year	0.7797	0.4213	0.3155	0.5273
4 year	0.2856	0.3442	0.2870	0.0084
6 year	0.8326	0.1470	0.3620	0.0338
Null hypothesis	ERA does not Granger Cause macro-variables			
2 year	0.3031	0.3312	0.5268	0.1275
4 year	0.3527	0.7222	0.2516	0.3535
6 year	0.2982	0.7221	0.7149	0.0428

Emerging Markets	Reserves	FX	Inflation	Equity
Null hypothesis	Macro-variables do not Granger Cause ERA			
2 year	0.9836	0.7161	0.4897	0.8396
4 year	0.2856	0.3442	0.2870	0.0084
6 year	0.4644	0.9957	0.8057	0.3355
Null hypothesis	ERA does not Granger Cause macro-variables			
2 year	0.7245	0.0239	0.6302	0.3296
4 year	0.3527	0.7222	0.2516	0.3535
6 year	0.8704	0.1574	0.7230	0.9514

Table 8: Hausman Test statistics

Table 8 presents the p-values of the Hausman Tests for all country groups and macro-variables as well as the datasets excluding Turkey. The null hypotheses are shown in column 1.

All countries	Reserves	FX	Inflation	Equity
Null hypothesis:	Cross-section is random			
2 year	0.2594	0.5841	0.2867	0.6031
4 year	0.7761	0.9649	0.7542	0.6145
6 year	0.7605	0.5736	0.4878	0.9626

Developed Markets	Reserves	FX	Inflation	Equity
Null hypothesis:	Cross-section is random			
2 year	0.6382	0.7527	0.2438	0.3218
4 year	0.2957	0.6910	0.5277	0.5953
6 year	0.6956	0.7012	0.7753	0.9102

Emerging Markets	Reserves	FX	Inflation	Equity
Null hypothesis:	Cross-section is random			
2 year	0.3870	0.6024	0.6385	0.6976
4 year	0.2957	0.6910	0.5277	0.5953
6 year	0.9380	0.5895	0.3051	0.7286

All countries ex Turkey	Reserves	FX	Inflation	Equity
Null hypothesis:	Cross-section is random			
2 year	0.3200	0.2973	0.4793	0.5769
4 year	0.9958	0.4093	0.5614	0.6500
6 year	0.4695	0.2367	0.6937	0.9458

Emerging Markets ex Turkey	Reserves	FX	Inflation	Equity
Null hypothesis:	Cross-section is random			
2 year	0.7680	0.0179	0.0770	0.4255
4 year	0.6294	0.0483	0.7238	0.6388
6 year	0.5705	0.0654	0.5155	0.4325