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Narratives in Economics

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Michael Roos and Matthias Reccius[1]

Narratives in Economics

Abstract

There is growing awareness within the economics profession of the important role narratives play in the economy. Even though empirical approaches that try to quantify economic narratives are getting increasingly popular, there is no theory or even a universally accepted definition of economic narratives underlying this research. First, we review and categorize the economic literature concerned with narratives and work out the different paradigms that are at play. Only a subset of the literature considers narratives to be active drivers of economic activity. In order to solidify the foundation of narrative economics, we propose a definition of collective economic narratives, isolating five important characteristics. We argue that, for a narrative to be economically relevant, it must be a sense-making story that emerges in a social context and suggests action to a social group. We also systematize how a collective economic narrative differs from a topic and from other kinds of narratives that are likely to have less impact on the economy. With regard to the popular use of topic modeling as an empirical strategy, we suggest that the complementary use of other canonical methods from the natural language processing toolkit and the development of new methods is inevitable to go beyond identifying topics and be able to move towards true empirical narrative economics.

JEL-Code: D91, E44, E71, B55, B41

Keywords: Narrative economics; complexity economics; narrative turn; textual analysis; NLP

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1 Introduction

Sacco (2020) asks whether we are observing a `narrative turn´ in economics and answers that economics is probably not ready for a narrative turn yet. Nevertheless, he sees great potential for economics in the analysis of narratives, because they are important determinants of human behavior. A narrative turn took place in several social sciences as part of the post-positivist movement, which questioned and challenged the positivist approach to the study of social phenomena (see Goodson and Gill 2011). Narrative approach means that researchers became interested in subjective human understanding and sense-making of phenomena, but also in social discourse. Narrative analysis entered the social sciences in the 1980s and 1990s, e.g. political science (Fisher 1984), psychology (Bruner 1986, Polkinghorne 1988), sociology (Richardson 1990) and science studies (Curtis 1994, Silvers 1995). At the same time, Deidre McCloskey was a pioneer in economics with her analysis of rhetoric and storytelling in economics (McCloskey 1985, 1990a, 1990b, 1994). However, it was not until Robert Shiller's (2017) Presidential Address at the American Economic Association that general attention to narratives and *narrative economics* (Shiller 2019) rose in the profession. While narrative economics is a promising endeavor, it is not an easy field for newcomers to make progress in. As Sacco (2020) rightly argues, there are still many loose ends to pull together and there is great benefit from interdisciplinary work. However, such interdisciplinary exchange with researchers from other social sciences or even from the humanities is not easy at all due to different concepts of narratives. Even within economics there are a variety of uses of the term *narrative* and of claims of what we can explain with the concept.

With this paper, we want to generate more conceptual clarity in narrative economics. We review the strands of the economics literature that use a concept of narrative and show that the concepts are not precisely defined. We propose a definition of *collective economic narratives* which we believe to be useful for research in economics and show how it can be applied. As a final contribution, we discuss the tension between a clear theoretical definition of narratives and the difficulties of its empirical implementation. We argue that empirical research should be guided by precise theoretical concepts, despite problems of measurability and data availability.

The main claim of our paper is that the term *narrative* is not well-defined in the economics literature. For most authors a narrative is some kind of *story*, but it sometimes also has the meaning of *topic* or *theme*. As we will show, empirical papers that try to measure narratives often simply identify topics. We argue that the precise use of terms is a prerequisite for scientific progress. When a research field is young, there might be benefits if terms and concepts are vague and open to interpretation, because this can stimulate fruitful discussion and creativity. But after an exploratory stage, rigor is needed in order to determine what knowledge has been created and where the gaps and limits are that should be filled by further research.

A good scientific definition should have four properties. First, it should be non-trivial, i.e. not too broad. Equating *narrative* with *story* would be a trivial definition, because we would just use a second term for the same object. Second, a definition should be non-vacuous, i.e. not too narrow. If we add too many qualifiers to the main *definiens*, it becomes hard or even impossible to find objects that fall under the definition. The third property is relevance. A scientific definition must be relevant for a specific community and a specific purpose. As said before, narratives are objects of investigation in many scientific disciplines, all of which have different aims of inquiry. For instance, linguists want to understand and explain language and understand narratives as an object of language. Economists, in contrast, are not interested in language per se, but only with regard to its relation to their main objects of inquiry such as the economic activities of production and consumption. Hence an economic definition of narrative can and should be different from a linguistic one. Finally, a definition should not contradict definitions in other fields. While we argued that different disciplines can use

different definitions, it is not conducive to interdisciplinary exchange and the progress of science as a whole if the disciplinary definitions have nothing in common or even contradict each other. At least the main elements of a definition should overlap and should be used with a similar meaning. In Section 3, we propose a definition of *collective economic narratives* which we believe to have these properties.

To illustrate the state of the art in narrative economics, it is informative to look at a recent paper of Robert Shiller. In Shiller (2020), he defines economic narratives as "stories that offer interpretations of economic events, or morals, of hints of theories about the economy" (p. 792). According to this definition, the main definiens is the term *story*, which itself remains undefined. Not every story is a narrative. Some stories "offer interpretations of economics events", for which Shiller uses the term *moral*. Alternatively, the story can offer "hints of theories about the economy". This definition is suggestive, but not precise, and hence itself requires interpretation. The "moral" element of the narrative definition might mean that narratives have an evaluative dimension, possibly linked to a certain suggested behavior. The "hints of theories" indicates that narratives also explain and contain statements about causal relations. Shiller (2020) proposes key words or phrases to measure six narratives which he believes to be associated with the U.S. macroeconomic evolution in the past 30 years: "Great Depression", "Secular Stagnation", "Sustainability", "Housing Bubble", "Strong Economy" and "Save More". He shows how the percentage of newspaper articles that contain these markers of narratives evolved since 1990 and gives a brief account of how he understands the narratives and their potential connection to the macroeconomy. At the end of the paper, he calls for further research which should provide better data on and quantification of narratives. While Shiller's ideas are suggestive and stimulating, they are also rather vague and subjective. For instance, on the alleged sustainability narrative, he writes: "This word [sustainability], as applied to conservation and climate change, went viral slowly over decades, from very small beginnings in the 1980s. It represents the idealism of the new generation, and logically leads to less intense spending" (Shiller 2020, p. 797). This claim neglects that there are different conceptions of sustainability that by no means necessarily imply less spending. As Levy and Spicer (2013) argue the idea of sustainable lifestyles in the post-growth or degrowth sense with less consumer spending never took hold in the U.S.. Instead, sustainability conceptions related to green growth are much more popular, because investment into green technologies is seen as source of economic growth and new jobs.

We argue that narratives are never independent from the people who invent and circulate them and from the researchers that analyze the economic impact of narratives. If this claim is true, it poses a great challenge for the economic analysis of narratives, because we cannot simply look at words or texts alone in order to identify narratives. We also have to identify agents' *belief systems*, which give narratives their meaning. In Section 2, we give an overview of how authors in economics use narratives in their research, before we propose our own concept of collective economic narratives in Section 3. In Section 4, we discuss two examples from the literature of how others use the term narrative and argue that these examples do not satisfy our definition. Section 5 discusses some challenges for quantitative empirical research that follow from our concept. We conclude in Section 6 pointing to potential ways forward.

2 Literature review

In this section, we provide a selective review of the economic literature related to narratives. The purpose of this section is to show that there are a variety of concepts of narratives and of contexts in which the term is used. The main conclusion from this literature review is that currently, we cannot speak of *the* narrative approach to economics or a coherent field of narrative economics. In fact, what

we find is that there are different strands of the literature in which the term *narrative* is used in quite different ways. In order to support this claim, it is sufficient to present a selection of typical papers.

We searched for papers with "narrative*" in the title in the *economics* category of the Web of Science database and found 327 papers in the period from 1997 until May 2021. As shown in Figure 1, on average about 5 papers per year were published from the end of the 1990s until 2012. In 2013 there was a remarkable jump to 19 publications and the number rose to 35 in 2020. Searching for "narrative*" in the abstract instead of the title shows a similar trend although the numbers are, of course, higher (see Figure 2). In the rest of the paper, we focus on the publications with "narrative*" in the title, because this is a harder criterion than when the term appears in the abstract.

Based on our reading of the abstracts we assigned the identified papers to seven categories as shown in Figure 2. As every categorization, this exercise is subjective and can be debated. In several cases, papers could also have been assigned to a different category. This does not pose a problem to our argument since our categorization only serves as a heuristic to get an overview about the various meanings of narratives in economics so far.

Figure 1: Count of papers with "narrative*" in title/abstract in Web of science category economics (2021 numbers are prorated)

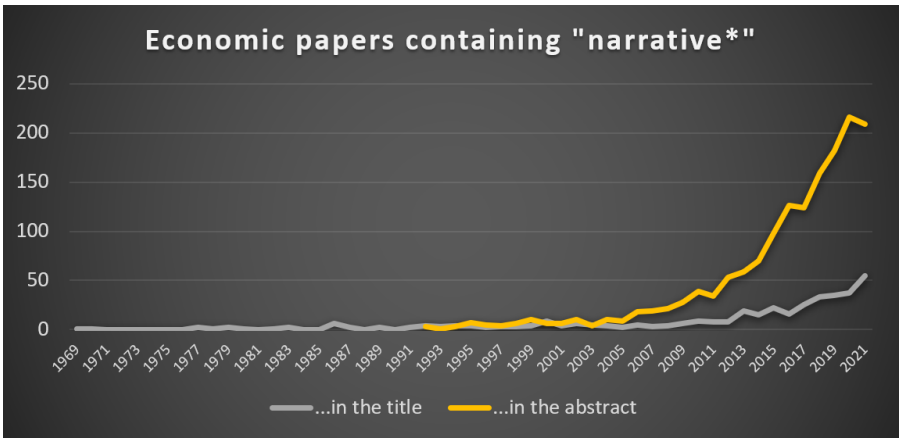
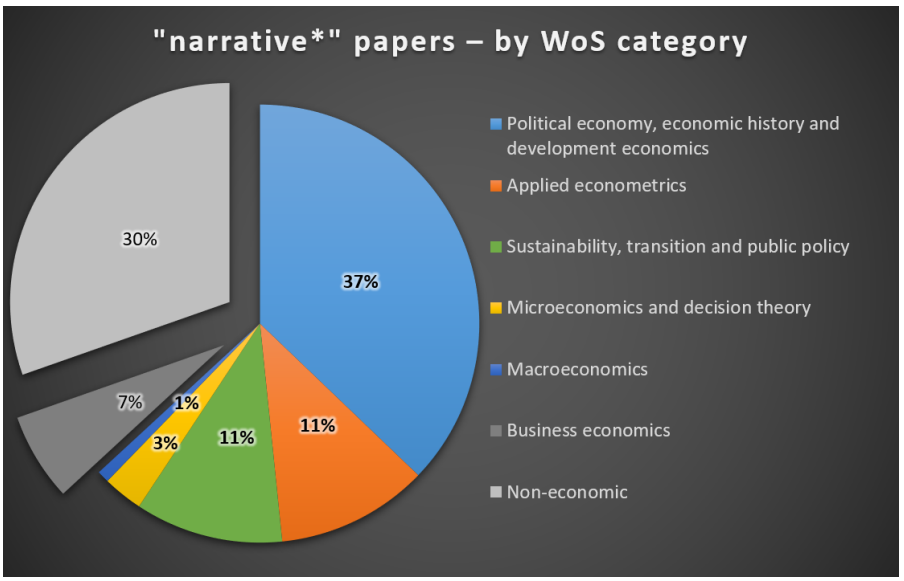


Figure 2: Categorization of papers with "narrative*" in title in Web of science category economics



We classify a rather large fraction of 30 percent of all identified publications as non-economic although they are listed in the Web of Science category *economics*. This category also includes book reviews and some health and medical science publications that do not qualify as health economics. Another large share of the papers in this category belong to political science rather than economics. Because of its differing subject matter, the research pertaining to business economics has also been left out of the review.

In the following subsections we discuss what we consider to be the main ideas and uses of "narrative" in the categories (1) political economy, economic history and development economics, (2) macroeconomics, (3) applied econometrics (4) sustainability, transition and future thinking, and (5) microeconomics and decision theory.

2.1 Political economy, economic history and development economics

As mentioned in the Introduction, a narrative turn took place in political science already in the 1980s. As a result, it is not surprising that a large share of the identified papers falls within the broad scope of political economy. However, the lines between political economy and political science proper are blurry. In political science, narratives are assumed to be actively and socially constructed by policy stakeholders to serve a specific purpose (Miedzinski 2018). They result from blending empirical facts with normative evaluations and goals (Majone 1989).

The early political economy literature uses the term *narrative* not as an analytical category, but as a shorthand for a specific way in which a phenomenon is explained and interpreted, either in the research literature or by "conventional wisdom". In most of these cases, a dominant explanation of a particular issue is laid out, disputed and finally appended by a marginalized narrative whose importance is perceived to be underappreciated in the literature. As a result of this method, the status of the dominant narrative is reduced to a mere perspective rather than a proven fact. A good example of this use of *narrative* is Gottfried and Hayashi-Kato (1998) who deconstruct the success story of the Japanese economy in the post WWII era: While the dominant narrative stresses distinguishing labor market features such as lifetime employment guarantees as the most important factors of Japanese growth, Gottfried and Hayashi-Kato (1998) contest this conventional view by highlighting the important role of non-standard employment of women. The authors combine insights gained from official statistics with government documents and interviews conducted with government officials to substantiate their narrative claims. The issue of women being relegated to part-time work and caregiving is what the authors call the "gendered subtext of the economic miracle" (Gottfried & Hayashi-Kato (1998)). Other similar examples are McMaster's analyses of "quasi-market" narratives in the context of welfare-state reforms and commodity narratives in health economics (McMaster 2002, 2013), Good's take on economic performance in 19th and 20th century Europe (Good 2002) and Hartmann's exposition on Neo-Malthusian scarcity narratives (Hartmann 2010). This usage of the *narrative* concept is also present in a rather political strand of the development economics literature, where such dominant narratives often concern issues surrounding agriculture and land-use (Bergius et al. 2020, Dercon 2013, Ellis and Manda 2012, Fairhead and Leach 1995) or the effects of trade and development aid (Engstrom and Hajdu 2019, Gautam 2019, Bene et al. 2010). Occasionally, the dominant narrative to be replaced is explicitly linked to serving political interests and the preservation of power (Mehta 2001).

A few publications from this category explicitly claim to develop narratives themselves. Hoaas (1993) delivers a reflexive analysis of economic teaching principles that he refers to as a historical narrative of methodological changes contained in economic textbooks. Interestingly, the term *narrative* only appears once in the title of the paper. The goal in utilizing the term is simply to describe Hoaas´ own process of structuring the historical evolution in the teaching of economics. However, this paper and particularly some follow-up research (Hoaas and Madigan 1999) also features what must be

considered narrative summaries of central ideas and theories developed by important scholars of economics throughout history, starting with Smith´s famous “invisible hand”. Roe (1995) works out two dysfunctional narratives in the context of African economic development and calls for the development of policy-relevant counter-narratives, including some of her own suggestions. To rise above the “Neo-Malthusian Doomsday Scenario”-narrative about population growth as the root of African stagnation, Roe (1995) suggests a counter-narrative prominently featuring the poor state of educational systems in the region and views experts in government and international organizations as responsible for inducing the needed reversal in thought patterns.

More recently, there was a shift in how *narrative* has been used in the political economy literature. Instead of standing for an interpretative story about the world, it denominates the stories that political agents in the socio-economic system use themselves. The shift, hence, is changing the scope of narratives from observers’ interpretations of real-world phenomena to narratives as real-world phenomena themselves that are to be explained in scientific theories or formal models. Eliaz and Spiegler (2020) view political disagreements as a “clash of narratives''. They admit that the term *narrative* is vague and they provide a specific definition in the context of a formal network model. According to this definition, a narrative is a causal model that maps (political) actions to consequences, which can be represented by a directed acyclic graph. An example of such a directed acyclic graph is:

trade policy -> imports from China -> employment

which links U.S. employment to U.S. trade policy via its effect on imports from China in a causal story. In political debates different narratives are used that employ different intermediate variables and arrange variables differently in the causal scheme. Politicians offer competing narratives to the public, which selects certain narratives in order to form beliefs that are used to evaluate policies. The model describes an equilibrium process of narrative production and selection.

Antoci et al. (2020) are interested in how social influencers can affect the public opinion with competing narratives. They define narratives “at a very abstract level, … [they] might reflect a variety of possibilities: from purely fictional accounts that for some reason have become salient to the public opinion, to narratively biased accounts of real facts, to folk economic theories” (p. 482). In an analytical model they analyze the optimal persuasion effort of a representative influencer who wants to choose one of two competing narratives in order to maximize his welfare which depends on his impact on public opinion. The model describes the public opinion dynamics that result from the influencer’s behavior and the properties of the diffusion process.

2.2 Macroeconomics – narratives and economic fluctuations

Robert Shiller’s (2017, 2019, 2020) contribution to the study of economic narratives goes well beyond merely directing attention to narratives and coining the phrase “narrative economics”. Compared to the other strands of the literature presented herein, Shiller’s idea that viral narratives have a causal impact on the macroeconomy provides a fundamentally different paradigm for the power of narratives than any previous approach in economics. Shiller (2019) focuses on grand economic narratives like the rampant fear of technological unemployment in the 1930s (Shiller 2019, p. 187). Particularly, he works out the conditions under which such narratives can form and what factors determine whether the narrative ends up spreading virally throughout society (p. 175). The most important aspect of his brand of narrative economics, however, is the notion that narratives ultimately feed back to the macroeconomy by influencing decision making and behavior on a broad scale. In line with his past work on investor enthusiasm and irrational exuberance (Shiller 2000), examples provided by Shiller are often associated with situations characterized by self-fulfilling expectations such as bank runs, real-estate bubbles and the wage-price spiral. Fertile ground for high

contagion rates of narratives is provided by narrative constellations – a combination of similar narratives working in tandem – and high rates of repetition of a narrative.

Collier and Tuckett (2021) describe regional disparities within countries as a narrative problem in need of fixing through collective action. They frame the decline of regions as a coordination failure between different local networks, such as business or public policy, to act in concert as a result of insufficiently shared narratives about the region. To overcome this narrative dysfunction, beliefs need to be reset incrementally by a universally trusted leader who may bridge those networks (Collier and Tuckett 2021, p. 106). According to this model, narratives serve the role of setting beliefs and informing actions that carry significant and macroeconomic consequences, which corresponds well to Shiller´s foundational ideas about economic narratives. However, the notion of an agenda-setting leader actively promoting a narrative to help it build up to a critical mass is somewhat at odds with Shiller´s ideas on the formation of narratives. While Shiller does describe the connection of a narrative to a charismatic person or a human-interest story as increasing its virality, he does not ascribe a coordinating function to this person. The human-interest component makes the narrative more attractive to remember and easier to tell, but the narrative itself, according to Shiller, forms and spreads bottom-up. Resembling Beckert and Bronk´s (2018) concept of *Imaginaries*, Collier and Tuckett maintain that, over time, narratives can harden and get ingrained in a social identity, eventually graduating to *deep stories* that become harder to change. Collier and Tuckett (2021) also ascribe the term *narrative* to monetary policy makers influencing inflation expectations through careful communication of policies and economic conditions (Collier & Tuckett 2021, p. 98). Since the advent of text mining as a tool of empirical economics, the growing central bank communications literature has implicitly used a concept close to that of economic narratives, for the most part without using, let alone clearly defining the term *narrative*.

In the wake of the financial crisis of 2008, some high-profile publications emphasized the importance of popular stories and other previously marginalized aspects of economic life in order to show a path forward for the field of macroeconomics whose blind spots were blatantly exposed by the crisis. Reinhart and Rogoff (2009) describe how verbal accounts of macroeconomic and societal stability rationalize a feeling of comfort and security that prevails amongst economic professionals and politicians alike, even in the face of uncertainty, instability and looming crises. Even though Reinhart and Rogoff do not refer directly to narratives, the stories they recount fit well into a narrative framework. Like Shiller (2000, 2019), Reinhart and Rogoff (2009) refer to asset price bubbles. But while Shiller examines real estate bubble formation from the perspective of the private household attempting to profit from the (supposed) ongoing rise in prices, Reinhart and Rogoff (2009) focus on how scientific narratives on those developments often foster a sense of acceptance and deny the diagnosis of a serious threat to stability. In both cases, agents use a biased selection of facts and metrics and string together a sound narrative in order to justify their actions and move forward. With regards to financial crises, Reinhard and Rogoff suggest a regulatory scheme that allows politicians and experts to hedge against the downside risk of crises, despite widespread belief that a crisis is improbable. In essence, they accept the enormous convictive power of simple narratives and argue for a political framework that is robust to exuberance instead of trying to curb the exuberant narrative itself. Akerlof and Shiller (2009) reinvigorate the Keynesian notion of animal spirits to explain not only the financial crisis and adverse financial events but economic behaviour in general. They highlight the economic importance of concepts such as fear, confidence, a concern for fairness and the spread of popular narratives. These concepts are difficult to formalize and, to varying degrees, contradict the assumption of rationality and have thus been largely neglected in economic theory. Akerlof and Shiller (2009) postulate that economic decisions often hinge on the belief or

disbelief in certain stories because stories can influence expectations, inspire confidence or instill fear in economic agents.

In the past decade or so, text mining techniques have increasingly been utilized to identify topics in an economic policy context, particularly in finance and the central bank communications literature. Not unlike the idea put forward by Akerlof and Shiller (2009), the simple premise of this research is the assumption that verbal or textual information provided by policy makers can influence expectations and, therefore, economic decision making. At the same time, the structure of the information that is extracted from text sources and then used to explain variations in economic variables has not been informed by economic theory (or theory of any other kind) but is largely a result of the available tools. The benchmark method, Latent Dirichlet Allocation (LDA), is a topic model that identifies term clusters resembling topics from large corpora of documents based exclusively on their co-occurrence in these documents. Such topics can then be assigned to documents probabilistically and their prevalence over time may in turn serve as a basis for predicting economic variables. Since Shiller´s influential publications (Shiller 2017, 2019), authors are now starting to refer to Shiller´s concept of economic narratives in empirical studies. In a paper involving news from the US, Japan and Europe, Larsen and Thorsrud (2018) investigate whether certain growth-related news topics identified with LDA `go viral´ and exhibit cross-country spillovers. Building on Shiller´s epidemiological paradigm, they show that international narrative epidemics tend to be US-centric – ie. they are mostly associated with macroeconomic developments in the US – and generally last for 4 to 5 months. Using a Dynamic Factor Model (DFM), they also find that narratives correlated with economic expansions differ systematically from those associated with contractions and that topical diversity tends to decrease in and around recessions.

Borup et al. (2020) investigate open-ended questionnaires from a daily survey of US investors to quantify the real-time development of narratives related to the economic impact of COVID-19. Using a large VAR-model containing LDA-topics and macro-financial variables, they find that narratives and the macroeconomy exhibit a bi-directional relationship. This finding confirms a similar point made by Shiller (2017) which he views as a fundamental problem for implementing causal research designs in narrative economics. While Borup et al. (2020) make the rather conventional methodological choice of quantifying narratives through LDA, their choice of using survey data is unique since it does not rely on the selection and filtering mechanisms present in the context of news or social media. However, they emphasize that the three aforementioned sources can serve as complements when identifying the diffusion of popular narratives because they influence each other in complex ways. The researchers find different lead-lag relationships between sources that depend on the time horizon of transmission and the content of the narratives themselves. Specifically, *job loss* narratives first appear on questionnaires and then – as labor market statistics are published – spread to the news and social media, reflecting a divergence between subjective fear of job loss and news-based *job loss* narratives. The authors find that these dynamics between sources are atypical and the direction of diffusion tends to be reversed for most other COVID-19 news updates.

2.3 Applied econometrics

A small strand of the empirical macroeconomic literature marries a particular concept of economic narratives to the dominant DSGE-framework. It builds on a study conducted by Romer and Romer (2004) who use qualitative, narrative data issued by policy makers to refine standard econometric models of the macroeconomy. To attain better estimates of the effects of monetary policy, they infer *intended* funds rate movements from historical FED-documents, arguing that using these narrative records helps to eliminate the endogeneity inherent in actual policy changes. In the spirit of this identification strategy, narrative information is also used to inform sign restrictions for structural parameters in SVAR-models (Antolín-Díaz and Rubio-Ramírez 2018). While the term *narrative* was

first applied to this type of research in the 2000s, Romer and Romer started using narrative information contained in FOMC documents to identify monetary shocks much earlier (Romer and Romer 1989). Romer and Romer (2010) apply the same basic principle developed in the context of monetary policy to investigate the effects of fiscal policy in the US. In this study, based on a variety of documents such as presidential speeches and reports of congressional committees, the motivation behind tax changes is analyzed. By including only ideologically motivated tax changes and disregarding those that are correlated with current business cycle developments, they find a larger, more significant negative effect of tax hikes on output compared to using ordinary measures. Cloyne (2013) and Gil et al. (2019) employ similar narrative strategies to investigate tax effects for the UK and Spain respectively, finding similar effects. While most of these narrative studies suggest a contractionary effect of tax increases, the magnitudes of the effects identified varies (Mertens and Ravn 2014).

Gil et. al (2019) use similar contextual information issued by the Spanish government to assess the motivations underlying fiscal policies measures and refine their structural VAR-model. Based on the same case-by-case evaluation pioneered by Romer and Romer (2004), they use this narrative data to differentiate between tax changes triggered endogenously by macroeconomic developments from exogenous changes (like introducing a VAT to comply with the rules of the European Economic Community). Endogenous changes are again excluded from the model, providing an improved basis for causal claims. Drautzburg (2020) uses the narrative DSGE approach to combine the investigation of monetary policy and tax changes. He also includes a narrative proxy for government spending in his model to reduce the dependence of DSGE-VARs on structural assumptions in general and to quantify the degree of misspecification inherent in normal DSGEs.

Li (2017) summarizes the key difference between this “narrative approach” and standard fiscal VARs regarding the composition of policy measures that they identify. He notes that the narrative method finds government employment compensation to play a dominant role in fiscal policy while increases in government purchases of goods and services tend to dominate according to standard VAR-models.

Pitschner (2020) uses corporate filings by publicly traded companies to investigate the price setting behavior of firms. While the data used is micro-data, the article tries to shed light on aggregate variables related to the supply side of the economy. The particular conception of narrative employed is also very similar to that used by the DSGE literature. The difference between this strand of the literature and economic narratives in the sense of Shiller (2017) is two-fold: First, narratives are not themselves considered autonomous drivers of economic fluctuations. Instead, “narrative” is merely verbal information that is used to either proxy intentions behind economic or corporate policies (Gil et al 2019, Pitschner 2020) or to serve as an early indicator for desired policy changes (Romer 2004).

2.4 Sustainability, transition and future thinking

In the sustainability and future thinking literature, a larger tendency for researchers to develop or craft narratives can be observed compared to the other categories. Through this notion of creating narratives, this strand of the literature is conceptually related to the view prevalent in political science that narratives are actively created constructs that also serve a specific political purpose. The underlying concept of narratives adopted in the sustainability literature is a rich one: Rather than using the term *narrative* in an act of mere dissociation from a particular idea or from an interpretation of the facts – as it is common practice in political economy –, research tends to focus on both the consequences of certain narratives for society and the roots and terms of their initial formation.

Blignaut and Aronson (2020) advocate the development of a global restoration narrative to coordinate action against climate change. They proceed from the diagnosis that the lack of sufficient

action taken by developed countries against climate change is in large part due to the complexity of societal and ecological systems. This results in ecological restoration turning into a *wicked problem*. Disparate groups of actors with radically different beliefs and frames of reference need to work together to solve this wicked problem which in turn evokes fundamental uncertainty and conflict. To overcome this wickedness and to nurture a restorative culture, a *grand narrative* is needed (Blignaut and Aronson 2020). Daigneault et al. (2019) develop five narratives with regards to possible developments in the forest sector, each reflecting different degrees of sustainability along the dimensions of climate change adaptation and mitigation. In contrast to the political economy idea of narratives being constructed for a political purpose, the authors construct these narratives in an explicit attempt to inform the climate change research and modeling community. The term "narrative", as used by the authors, roughly approximates the term scenario. Schanes et al. (2019) also use narratives as tools for scenario development: Three scenarios for a transformation to a resource-efficient society are developed that are – among other aspects – characterized by different principal actors and governance models. Terzi (2020) reviews literature from a diverse set of disciplines to shed light on how an impactful behavioral narrative for decarbonization could be crafted. This attempt also reflects the paradigm that large-scale buy-in by the public and fundamental lifestyle changes need to occur to achieve a green transition.

Miedzinski (2018) presents a tool for the analysis and creation of narratives emerging from the political process. With his approach, he tries to identify and reconstruct storylines and beliefs voiced by political actors that are related to future scenarios and outcomes. His analytical framework POLiFRAME imposes four layers on such narratives: First-order problems (the current issues that need to be addressed), systemic deficiencies (the roots underlying those issues), scenarios of change (solutions to overcome the issues) and future vision ("What does the world look like absent of these issues?"). These narratives span several temporal dimensions from the interpretation of historical facts to a prospective policy vision. The combination of these dimensions and possible incoherencies between them allows for an analysis of the actor´s deeply held worldviews and assumptions. The goal of this framework is to allow for a critical reflection on policy frames. The POLiFRAME methodology of separating narratives into several layers of understanding has strong conceptual ties to causal layered analysis (CLA) (Inayatullah 1998), a qualitative method for scenario planning that attempts to enhance and structure our understanding of the forces and ideas that shape different futures. However, studies that instead place their focus on analyzing narratives still form a majority.

Raven and Elahi (2015) develop an analytical model of narrative structure in futures research using insights derived from narrative theory, motivated by the premise that storytelling is often an integral ingredient of scenario development and design. They demonstrate how, in futures projects, the literary terms *world*, *story* and *narrative* can be considered conceptually equivalent to *data*, *analytical approach* and *final outputs*, respectively. According to their arguments, a narrative developed by scenario developers can be susceptible to be tarnished – either accidentally or purposefully – by manipulative rhetorical framing, resulting in the undermining and blunting of its impact. Borrowing from a range of narrative theories including Plato´ poetic dichotomy, Raven and Elahi (2015) maintain that avoiding these issues requires matching the narrative strategy and mode of a research paper to its purpose. Wittmayer et al. (2019) exploit the linkages between future studies and narratives, describing the *narratives of change* (NoC) employed by social innovation initiatives and highlighting the role of such narratives in forming social identities and collectively shared worldviews. Coulter et al. (2019) conduct a qualitative study by interviewing climate change professionals, finding that a lack of shared future-oriented change narratives precludes proactive climate change adaptation measures from getting realized.

Researchers in this strand of the literature are conscious of the fact that narrative as a mode of cognition is intimately linked to transformative thinking. Liveley et al. (2021) emphasize the importance of narratives for future thinking, arguing that, since narrative theory aids in recognizing cultural perspectives and also the limits of human imagination, working with narrative tools is vital for enhancing future literacy. Their argument highlights a fundamental connection between sustainability and narratives: The former necessitates developing insights and ideas about an uncertain future while the latter is able to evoke, formulate and structure those ideas. However, the connection between narratives and sustainability extends beyond this relation: Since sustainability studies look for ways to enable a transformation of society by certain criteria, they tend to transcend positive science to also involve normative judgements. Narratives can express these normative evaluations in a clear and concise manner.

2.5 Microeconomics and decision theory

Modern decision theory has overcome the monoculture of rational choice theory long ago: Since the inception of the subfield in the 1950s (Simon 1955), behavioral economists have been working out a laundry list of biases and heuristics, explaining behavioral anomalies and sawing away at the hegemony of the mathematically convenient but unrealistic rational choice theory (Kahneman and Tversky 1979, Thaler and Shefrin 1981). Proponents of this stream of the literature have since received both Nobel Prizes and considerable pushback with regards to the real-world generalizability of their results (Gigerenzer 1991, Gigerenzer and Brighton 2009, Taleb 2020).

Callahan and Elliott (1996) mark an early – if not much-noticed – call to integrate narrative into behavioral economics and thus put the content of human deliberation into focus in addition to its processes and outcomes. Maligning state-of-the-art experimental designs as too restrictive and considering Etzioni´s (1988) argument that norms and affects are central to decision making, the scholars call for the use of free-form narratives to further the study of real-world behavior. Much later and firmly in the tradition of the highly influential descriptive approaches to decision making, David Tuckett developed the conviction narrative theory (CNT) (Tuckett and Nikolic 2017). According to the CNT, economic actors constantly navigate an environment of radical uncertainty by building plausible narratives about the consequences of their actions. Through interactions with their social environments, conviction narratives are formed that allow actors to weigh their options, make a choice and stick to their decision for the long run. Bénabou, Falk and Tirole (2020) utilize a conception of narratives that builds on the epidemiological analogy proposed by Shiller (2017) and apply it to the choice to behave either selfishly or altruistically in a social context. The focus of their analysis concerns the spread of two contradictory narratives through a network – one narrative promoting responsible and prosocial, the other selfish action that disregards negative externalities. Depending on the interaction structure within the network, prosocial or antisocial norms can emerge as the de facto moral standard and form a behavioral equilibrium.

Narratives are also analyzed in experimental settings. Yang and Hobbs (2020) compare the efficacy of using narrative information instead of logical and scientific reasoning to elicit a positive attitude from consumers regarding the use of gene editing in food technology. They find that telling a story using a personal and personable style significantly improves acceptance of novel biotechnology compared to conveying scientific information in a matter-of-fact way. In the tradition of the framing-effect first described by Kahneman and Tversky (1979), narrative is used as an alternative way of conveying, or framing, information in this study. Harrs et al. (2021) also analyze the effect of narratives in a behavioral experiment. However, their conception of narrative goes well beyond how information is presented and instead describes differences in judgement. Optimistic and pessimistic assessments of the COVID-19 pandemic are presented to subjects and are found to have a significant impact on the subjects´ expectations regarding the economic consequences of the pandemic.

2.6 Definitions and paradigms used in the literature

The aforementioned literatures differ substantially in what they imply and actively state about the substance of the concept *narrative*. Those differences mainly revolve around the scope or complexity of the narrative concept on the one hand and its centrality for economic processes on the other hand. Along those two dimensions, three basic paradigms or categories can be isolated: (1) narratives as drivers of the economy, (2) narratives as a medium for policy analysis, and (3) narratives as an interpretative summary of the facts.

The conception of narratives as *drivers of the economy* is virulent in the macroeconomics literature described in 2.2. This narrative concept is both very rich and complex and also views narratives as central to economic outcomes. This paradigm is also adopted by David Tuckett (Tuckett and Nikolic 2017, Collier and Tuckett 2021) and the CNT in the context of microeconomics and decision theory in 2.5. Tuckett´s and Shiller´s narratives can be considered as two sides of the same coin, the former laying out the individual cognitive conditions for the development of narratives and the latter describing their social diffusion and macroeconomic consequences.

The second basic paradigm views narratives as a *medium for policy analysis*, as a particular kind of information that can help to broaden one's understanding of political decision makers´ motivations. This narrative gain in understanding can then be used to categorize policy decisions, refine econometric models and improve the identification of policy-relevant parameters. This conception of narrative is manifest in the applied econometrics literature presented in 2.3 and – while the term narrative is not used here – it is also underlying much of the recent literature on central bank communication. This concept of narrative is flexible and very simplistic because it essentially reduces a narrative to be a set of policy-related information deemed relevant for a study. It is only central insofar as it provides insights into policy making but not as an independent driver of economic processes. If anything, the passivity of such a narrative is a necessary condition since an independent economic effect of the narrative would bias the parameters of interest in these studies.

The paradigm that is most widespread in the literature views narratives as an *interpretative summary of the facts* concerning a particular – often controversial and politically relevant – issue that can be scientifically described or even actively created. This view is particularly virulent in the political economy and development economics literature. Usually, the label “narrative” is attached to a statement that is widely considered to be true in order to attack its hegemonic status, enable criticism and allow for the proposition of alternative, often contrary narratives.

3 Clarification of the concept “collective economic narrative”

Our literature review showed that the term *narrative* is used with different meanings in economics and the provided definitions are often rather vague. In many cases, economist authors do not even define the term, but rather give a loose description. We believe that conceptual clarity is important for scientific progress and hence propose a definition of *economic narratives* that captures important aspects mentioned in different strands of the literature. We distinguish *collective* narratives from *personal* or *private* ones, which people create for themselves and by themselves, e.g. to make sense of their own life and to create their personal identity. “Collective” means that the narrative has relevance and functions in a social context. Our definition is meant to be relevant and fruitful for further research in *economics*. We do not want to make any claims about the usefulness of our definition in general.

We derive our definition from a complexity perspective on economics, which emphasizes off-equilibrium dynamics, novelty and adaptation and regard the economy as a complex adaptive system (see Roos 2017). According to W. Brian Arthur (2015, p. 24) complexity economics “sees the

economy not as a system in equilibrium but as one in motion, perpetually `computing' itself – perpetually constructing itself anew. Where equilibrium economics emphasizes order, determinacy, deduction, and stasis, this new framework emphasizes contingency, indeterminacy, sense-making, and openness to change". Note that Arthur mentions *sense-making* as an important element of complexity economics. Agents in a complex adaptive system can have only very limited knowledge of the whole system in which they act. Their knowledge is always preliminary, subject to change and constructed in social processes (see Richardson 2005). Narratives play a crucial role in these social processes of knowledge generation and sense-making. They enable agents to act purposefully in an uncertain and ever-changing environment.

3.1 Definition of "collective economic narrative"

We propose the following definition:

A collective economic narrative is a sense-making story about some economically relevant topic that is shared by members of a group, emerges and proliferates in social interaction, and suggests actions.

Next, we explain the elements of the definition and argue why we consider them important.

Story

It is uncontroversial in the literature in economics that narratives are stories. Many authors even use the terms interchangeably, but they never really define what a story is. We suggest using *story* to mean "an articulation of a temporal sequence of events". This implies that a story has a certain structure and that a simple collection of terms or categories is not a story (and hence not a narrative). The literature on quantitative text analysis calls unstructured collections of terms *topics*[1].

The English novelist Edward Morgan Forster (1927) gave an example of a (minimal) story: "The king died and then the queen died" (p. 86). The merit of a story is that the reader or listener wants to know what happens next, i.e. a story appeals to the curiosity of the audience, which he considers "one of the lowest of the human faculties" (p. 86). Forster contrasts a story with a *plot*: "`The king died, and then the queen died of grief' is a plot. The time-sequence is preserved, but the sense of causality overshadows it" (Forster 1927, p. 86). Hence, a plot provides an explanation, why events unfolded in a temporal sequence. An example of a minimal economic story is: "Inflation rose and then the central bank raised the interest rate". A second story would be: "The central bank raised the interest rate and inflation slowed down." Note that the reader might infer a causality between the mentioned events, but the stories themselves do not mention a causal relationship.

Sense-making

A narrative is a special kind of story. Sense-making implies that the story has a meaning for the speaker and the listener. It is told with the intention to understand the world and to interpret some data, event or action. Humans seem to have an innate desire to make sense of what they observe, i.e. to explain it to themselves and others. Michael Shermer argues[2] that humans often even detect apparently meaningful patterns in meaningless noise, what he calls *patternicity*. The existence of a meaningful pattern implies that the elements of the pattern are causally related and do not simply occur by chance. The aversion against randomness and the desire to detect meaningful patterns or causalities has an evolutionary rationality. Patterns and the knowledge of causal relationships make it possible to predict what will happen after a certain event has been observed. This is true for natural events, e.g. the onset of a thunderstorm after a sudden drop in temperature and heavy winds, for

[1] In linguistics, a topic is the phrase in a clause that the rest of the clause is about. In discourse analysis, the topic is what a discourse is about.

[2] https://michaelshermer.com/sciam-columns/patternicity/

human behavior, e.g. aggressive reactions after an insult, or for socio-economic systems, e.g. the response of the stock market to an increase of the interest rate by the central bank. The ability to predict future events is important for making rational decisions. In a social context, sense-making can also mean that a justification for behavior is given. A sense-making story can explain why an agent behaved in a certain way in the sense of providing a justification for it. Narratives as sense-making stories are plots in the language of Forster (1927). Therefore, a because-sentence would be a minimal version of a sense-making story, e.g. "Inflation slowed down, because the central bank had raised the interest rate". Sense-making stories related to the future could be if-then statements like "If the central bank raises the interest rate, then inflation will slow down".

Sense-making requires that the story connects to the *belief systems* of the involved people. We use the term belief system in a broad sense here, including *mental models* and normative, evaluative, affective and motivational elements (see Abelson 1979). Mental models are cognitive representations of the external world, which people use to interact with the world and to make decisions (Jones et al. 2011). They describe the entities people perceive to exist in the external world and the relationships between them. People use them to understand and explain what they observe in the world and to anticipate the future. However, people do not only form representations about how the world works, but also hold beliefs about whether this is good or bad and how the world ought to be. Hence, belief systems include representations of alternative worlds in addition to the mental models of the existing world, which can motivate them to take action in order to change the existing world (Abelson 1979). We call the evaluative and prescriptive part of the belief system the *value system*. According to Shalom Schwartz (2007), values are beliefs linked to affect which motivate action and serve as standards or criteria. Importantly, values form a system of *value priorities*, i.e. they are ordered by importance relative to one another. Individuals or social groups differ in their value priorities. In our conception, the value system also contains *evaluation rules* by which values are related to the mental models and *evaluations*, which are stored outcomes of evaluative processes.

Personal narratives can be seen as parts of the belief system of a single person. Social narratives, however, involve the belief systems of at least a teller and a listener of the story. The teller may want to share his/her view of the world with the listener. Whether this can succeed depends on the degree of overlap between the belief systems of the two agents. If the belief systems are too different, a narrative may make perfect sense to the teller, but not at all to the listener. A good example for incongruent narratives based on different belief systems is the claim of the Turkish president Recep Tayyib Erdoğan that inflation will slow down, if the Turkish central bank lowers the interest rate, which does not make sense from the perspective of most mainstream economists[3].

A narrative may transport *subtext* in addition to what is said explicitly and directly. The subtext appeals to the underlying belief system. The use of subtext simplifies the communication of difficult contents among agents who share the same belief system, because only the most important elements are articulated whereas the connections between them, their meaning and the relation to other topics are just implied and must be completed by the listener. At the same time subtext generates ambiguity, because it is not there but must be read between the lines. Listeners with a belief system that differs from the one of the teller, either have a different interpretation of the subtext or do not even notice that subtext is present. An example of subtext is when economists speak of "financial shocks" as the cause of financial crises. For the non-economist listener, a "shock" might be interpreted as a "sudden disturbance", but in the DSGE models of macroeconomic theory a shock is an unpredictable stochastic disturbance. Whenever economists who are used to thinking in

[3] https://www.ft.com/content/a3a2542f-0feb-4596-8357-30ab965697d6

terms of DSGE models talk about financial crises being caused by financial shocks, they always imply that the crisis was at least partially unpredictable and hence unavoidable.

Note that our definition of narratives as sensemaking stories differs from the concept of Eliaz and Spiegler (2020). For them "narratives can be regarded as causal models that map actions to consequence". We distinguish between the causal (mental) model and the narrative and argue that the narrative is a partial articulation of a more complex underlying causal model. If someone says "The central bank raised the interest rate and then the economy fell into a recession due to the bank lending channel", we would consider this a sense-making narrative, but not a complete causal model. The "bank lending channel" is a term for the model that links the increase in the interest rate and the recession, but it is not the model itself. The narrative makes only sense to someone who knows what "bank lending channel" means, i.e. who has an idea of the agents involved, the relationships between them and the assumptions about their behavior.

Shared by members of a group

In order to be a collective narrative, the story must make sense to members of a group and be told in this group and by the group. The group can differentiate itself from other groups by telling its narratives to outsiders who might have different (competing) narratives. Only group members will understand the subtext of the narrative, which is important for the sense of group identity. "A social narrative can bind people together since, as explained earlier, it is not a single narration event, but a series of narration events through which a story or its versions are retold and reheard, time and time again, by individuals, organizations, or institutions" (Shenhav, 2015, p. 58). By retelling the narrative within the group, a group identity is formed and the belief systems of the members are aligned.

A story can only make sense to a group, if the members of the group share a belief system, at least partially. If either the mental models or the value systems of the group members differ too much, the group cannot share a sensemaking narrative. In fact, the group may be defined by the shared belief system. The shared belief system is not only a prerequisite for the existence of a shared sensemaking narrative, it can also be formed by narratives. By telling each other individual narratives, the members of a group can find out where their belief systems are congruent and where they differ. Forming a group identity can mean that the members of the group adjust their belief systems such that they match better to those of their peers.

Emerges and proliferates in social interaction

Collective narratives are not *created* by any single agent, but are the outcome of repeated interaction between members of a group or of different groups. Collective sensemaking is an interactive process between members of a group, who share similar belief systems. Nobody who tells a story to others can know exactly which parts of the story make sense to them and which do not, because it is impossible to observe the complete belief system of others. Furthermore, the originator of a story does not know how and to whom the story is retold. A story proliferates in a group, if the initial listeners like it and tell their versions of it to others. The original story that somebody tells might resonate with other people or not, depending on whether it connects with their mental models and values. The resonating parts of the story are retold and the less convincing parts are dropped or modified. If different versions of a story circulate in a group, the group might try to integrate or merge them into a consensus version that contains the core of the different variants. In the end, a group narrative is left that nobody thought of in this way and that nobody could predict, hence it emerged.

Narratives do not only emerge as a consequence of within-group interaction, but also result from interaction between groups. The narrative of a group might be challenged by members of other groups that maintain different belief systems. If different groups compete in some arena, they may

have an incentive to differentiate their narratives as much as possible instead of aligning them. The evolution of a group narrative depends in complex ways on the participants and the rules and practices of the inter-group discourse.

Suggests actions

In economics and other social sciences, narratives are interesting because they suggest actions to economic agents. Social scientists analyze narratives not as an object that is interesting by itself, but because they have a function in groups or social systems. One of the main functions of narratives is that they enable groups to act despite fundamental uncertainty about the future (Beckert and Bronk 2018). In particular, they coordinate group action. If actions are interdependent, coordinated behavior is often more beneficial than isolated action. Coordination is achieved, if all members of the group have similar expectations about the outcomes of actions and if they evaluate the outcomes in the same way. This is not achieved by the told story alone, but by the reference to the shared belief system of the group members. The belief system uses the input from the narrative in order to simulate consequences of actions and to evaluate them.

Suggesting what to do in an uncertain world is another interpretation of sensemaking, in addition to the explanation of observed phenomena. Especially in uncertain situations, people often have a desire to act, even though the knowledge basis for rational decision-making is rather small. Patt and Zeckhauser (2000) termed this impulse to act *action bias.* Sometimes, rational behavior can be to do nothing and to wait until new information has resolved part of the uncertainty, but people's self-perception as an actor or decision-maker who has control over uncertainty can urge them to do something. This idea has some similarity to Keynes' concept of animal spirits – defined as "spontaneous urge to action rather than inaction" (Keynes 1936/2018 , p. 141). Akerlof and Shiller (2009) see *confidence* as part of Keynes' animal spirits and argue that stories can create or destroy confidence of consumers and investors. As a consequence, "we must understand that saving depends upon the stories we tell about our lives and our future" (Akerlof and Shiller 2009, p. 119). As one of many examples they mention the book "How a second home can be your best investment" (Kelly and Tuccillo 2004) which is filled with personal stories of people who bought homes and got happy. Akerlof and Shiller argue that such stories served as models for many people's behavior and hence contributed to the housing bubble in the U.S. before the financial crisis 2008. Similarly, Reinhart and Rogoff (2009) argue that before every financial crisis, financial analysts tell stories why "this time is different", i.e. conventional standard of asset valuation no longer apply, and why investors should carry on buying assets.

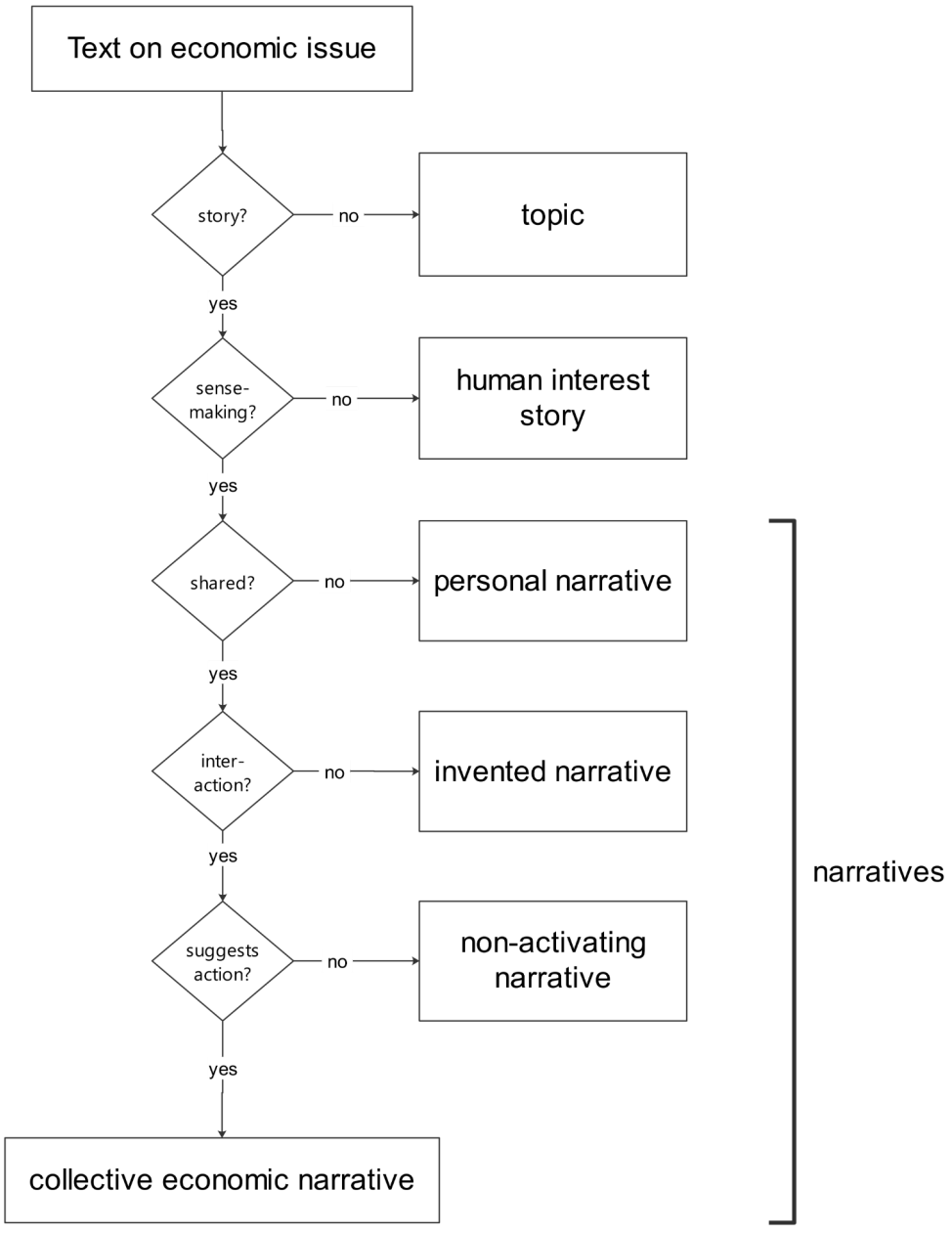
Akerlof and Shiller (2009) and Shiller (2017, 2019) compare the spreading of stories with virus epidemics. We argue that this view is too simple and that there is a fundamental difference between a virus epidemic and the propagation of narratives. The transmission of a virus happens unconsciously and passively. Normally, people do not pass on a virus on purpose. In contrast, telling narratives is an active process that can have an intention. While there are stories which are told without a purpose, many agents tell narratives with the intention of influencing others and persuading them to perform certain actions. This is the case for political narratives, which aim at political support by voters, or narratives in a business context, which can be geared toward employees, customers or investors. Often, it is not by chance that narratives suggest action. On the other hand, recipients of narratives may be exposed to them passively similar to a virus, but they might also seek them actively and choose how they react. While getting ill from a virus is not a choice, people at least in principle can choose whether they perform the suggested action or not.

3.2 Alternative texts

Our definition of collective economic narratives is demanding and contains many elements. Figure 3 summarizes these elements and proposes categories for texts that lack elements of our definitions. These alternative categories are not meant to be precise linguistic definitions, but rather useful heuristics for economists who analyze texts with their methods.

The fundamental test is whether a text is a sense-making story or not. If it is not even a story, i.e. a temporal sequence of events, we might speak of a topic as a collection of words. If a text is a story, but does not have a sense-making function, it could be an entertaining or human-interest story. Such gossip-like stories are very popular. They can go viral as described by Shiller (2017) and they may also create group-identity, because they are often about other persons and create an intimacy between the teller and the listener.

Figure 3: Is a text a collective economic narrative?



Our minimal requirement for a narrative is that a text is a sensemaking story. As argued before, we are interested in shared narratives that might have an aggregate economic effect, because it influences the behavior of many people. A narrative that is not shared is a personal or private narrative, which might be important for the behavior of an individual, but is unlikely to have aggregate effects.

Another important aspect is how a shared narrative came into existence. Our focus is on shared narratives as the emergent result of social interaction, because we consider this to be the typical case in public discourses via the news media. Of course, there can be shared narratives which did not emerge, but were invented or crafted by some powerful actor. An example could be the mission statement of a company, which normally does not emerge from a discourse among the company's stakeholders, but is composed by the owners or leaders. Government propaganda is another example of a shared narrative that was invented by a powerful actor. The agents who share these invented narratives may not be convinced by them and even feel internal resistance. Nevertheless, everybody in the respective group knows them. The group members also retell them at least in public, because they might fear some kind of punishment if they told a different narrative.

Finally, we want full economic narratives to suggest economically relevant actions, such as saving more or less, investing in a particular asset, changing prices or using a policy instrument in a certain way. As economists we are ultimately interested in economics behavior and its aggregate consequences. Narratives that do not suggest actions can have important functions for groups such as forming group identity and aligning the group's belief systems. We call these narratives non-activating narratives.

4 Examples from the literature

In this section we discuss two examples of how the term *narrative* is used in the current macroeconomic literature. It is not our intention to criticize these papers per se and we acknowledge that they are solid and stimulating research. Rather we argue that work of this kind is only loosely connected to economic narratives as we defined them in the previous section.

4.1 Shiller's Great Depression narrative

In his seminal paper, Shiller (2017) provides a number of examples for his concept of economic narratives that have a macroeconomic impact. One of them is the *Great Depression narrative* between 2007 and 2009 in the U.S.: "The 2007–2009 world financial crisis has been called the Great Recession as a reference to the Great Depression of the 1930s. Certainly, the narrative of the Great Depression was suddenly thrust into the national attention as never before, not since the 1930s" (Shiller 2017, p. 994). As an illustration for the existence of this narrative, he presents the frequency of appearance of the phrase "Great Depression" in news, newspapers and books, which skyrocketed in 2007.

Referring to Google Trends search counts, he argues that people were not really interested in the details of the events in the 1930s, because terms related details of history were not searched a lot. "It was more just a quick and easy way to communicate narrative: we have passed, by 2007, a euphoric speculative immoral period like the Roaring Twenties, the stock market and banks are collapsing in 2008 as around 1929, and now the economy might really collapse again like that; we might even be unemployed and on the street crowding around failed banks, yes really! End of basic narrative" (Shiller 2017, p. 994).

We argue that Shiller does not describe a Great Depression narrative, but a *public discourse* about the Great Depression. More precisely, the discourse is not about the Great Depression itself, but about how similar the situation in 2007 – 2009 was to the situation in 1929 – 1934 and what the past meant

for the present. The crisis of 2007 – 2009 was of course an economically relevant topic and it seems safe to claim that people wanted to make sense of the events that occurred. The stylized story that Shiller presents mentions apparent similarities between the two time periods, suggesting that people wanted to learn from history about their current situation, which is a case of sense-making. The story does not suggest certain actions, which is part of our definition of narratives. Discourse means that there are several competing narratives about the same topic, each of them shared by different groups and proposing different interpretations and suggesting different actions. We cannot present a systematic analysis in this paper, but we claim that there might have been at least four different Great Depression narratives at the time[4]:

1. *Fiscal stimulus is needed to prevent another Great Depression.*
2. *Monetary policy has learned the lessons from the Great Depression.*
3. *Elites forgot the lessons from the Great Depression.*
4. *What the Great Depression meant to ordinary people.*

The first narrative is mentioned by Shiller (2017, 2020) himself: "In 2007–2009 presidents and prime ministers invoked parallels to the Great Depression to justify their requests to apply stimulus" (Shiller 2017, p. 996) and "During the 2008–2009 financial crisis politicians around the world warned of the risk of an imminent depression in a bid to win acceptance of aggressive stimulus policies" (Shiller 2020, p. 796).

The second narrative is related to the first one, but told by and about a second group: central bankers. The public noticed quite early during the financial crisis that Ben Bernanke had studied the mistakes of monetary policy in the 1930s as a scholar before he became chair of the Federal Reserve Bank. Hence there was the narrative that the Fed had learned its lessons from the Great Depression and would do everything in order to avoid the mistakes of the past[5]. This narrative was shared by policy observers such as Gros and Alcidi (2009, p.2): "The conclusion for monetary policy is clear: the errors of the 1930s will not be repeated (policy) interest rates have been lowered decisively and quantitative easing is being actively considered even by the ECB". It was also told by Bernanke himself. On 8 April 2010 he said in a speech[6]:

> *"I was an academic economist and economic historian, with a particular interest in the causes of the Great Depression. … I thought that I would speak to you about the parallels--and differences--between that crisis and the more recent one, particularly regarding the responses of policymakers …. For its part, the Federal Open Market Committee, the monetary policymaking arm of the Federal Reserve, sharply and proactively cut its target for short-term interest rates from the fall of 2007 through 2008. … Using emergency authority last employed during the Depression, we created an array of new facilities to provide backstop liquidity to the financial system (and, as a byproduct, coined many new acronyms). Thus, we were able to help restore the flow of credit to American families and businesses by shoring up important financial markets, such as those for commercial paper and securities backed by consumer loans."*

The third narrative is in stark contrast to the second and tells about the failure of elites that had not learned their lessons from the Great Depression and hence only made the financial crisis possible. The narrative criticizes both neoclassical mainstream economists and neoliberal policymakers for the

[4] Note that the following sentences are potential names for the narratives, not the narratives themselves.
[5] https://www.newyorker.com/news/steve-coll/lessons-of-the-great-depression , https://nymag.com/news/businessfinance/bottomline/57177/
[6] https://www.federalreserve.gov/newsevents/speech/bernanke20100408a.htm

regulations of financial markets[7]. The relation to the Great Depression is that a global financial architecture – the Bretton Woods system – was negotiated in 1944 in order to avoid the financial troubles of the 1920s and 1930s. Over time, however, the experience from the interwar period waned and both economists and policymakers called for a liberalization of financial markets. This narrative is shared by economists who criticize the mainstream of their profession, such as Nouriel Roubini or Paul Krugman, but also by political activists such as Naomi Klein[8]. The suggested action is political reform, either in the form of Obama's new liberalism[9] or radically anti-capitalist[10].

Finally, we see a fourth narrative similar to what Shiller (2017) calls basic narrative. It is a narrative told by news media, which report the hardship of people during the Great Depression and ask whether a similar fate could loom again after the crash of Lehman Brothers[11]. The narrative provides orientation to the consumers of the news and places the extraordinary events of 2008 into historical context. In contrast to the other three narratives with their rather straightforward political implications, it is less obvious which actions this media narrative about the Great Depression suggests. The story of Giggi Cortese, reported on NPR[12] provides an example of how these narratives indirectly suggest action to people in 2008:

> *"Do you know how I survived those days?" Cortese asks. "[It] was going to the show every Sunday to see Shirley Temple, but [I] tell you, she was my inspiration to go on living. Honest to goodness, I couldn't wait till Sunday, and we would sit and wait for John Vuk to say, 'Come, ve go to the show, ve go to the show today.' You can certainly say that people had heart for one another — and if they were able to help, more often than not they did."*

Of course, these four narratives are not mutually exclusive and they might not be the only ones told in the Great Depression discourse. One might argue that the first and the second narrative constitute just one narrative about both fiscal and monetary policymakers doing the right thing based on the experiences of the past. But given that there was controversy about the right policy responses and the different interests of the actors, distinguishing two narratives provides a more nuanced view. For instance, there was a debate about the Fed's contribution to the crisis, which could have been at least threefold[13]. The first allegation is that the Fed had fuelled the housing bubble with cheap money for too long. Second, the Fed did not do enough to monitor and stop the malpractices at Wall Street and, finally, the Fed failed to rescue Lehman. It was in the interest of the Fed and in particular of Ben Bernanke to nurture the narrative that the Fed could have done little to avoid the crisis, but did its best to contain it. The topos of Bernanke as the scholar who had studied the Great Depression lends credibility to this narrative because of the subtext that a respected academic would not act in contrast to his deep knowledge.

Our definition does not only contain the element that a narrative is shared by a group, but also that it evolves over time due to social interaction. This evolution can affect both how the narrative is told

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[7] https://www.ineteconomics.org/perspectives/blog/macroeconomics-predicted-the-wrong-crisis, https://www.forbes.com/2009/02/18/depression-financial-crisis-capitalism-opinions-columnists_recession_stimulus.html?sh=31a3653722ef,

[8] https://www.economist.com/leaders/2008/10/16/capitalism-at-bay, https://www.democracynow.org/2008/10/6/naomi_klein

[9] https://www.newyorker.com/magazine/2008/11/17/the-new-liberalism

[10] https://www.wsws.org/en/articles/2008/09/lehm-s16.html

[11] https://www.dailymail.co.uk/news/article-1057303/So-learn-Crash-1929-avoid-21st-Century-Great-Depression.html, https://www.npr.org/templates/story/story.php?storyId=97468008

[12] https://www.npr.org/templates/story/story.php?storyId=97468008

[13] https://www.theguardian.com/business/blog/2010/sep/02/ben-bernanke-financial-crisis-inquiry

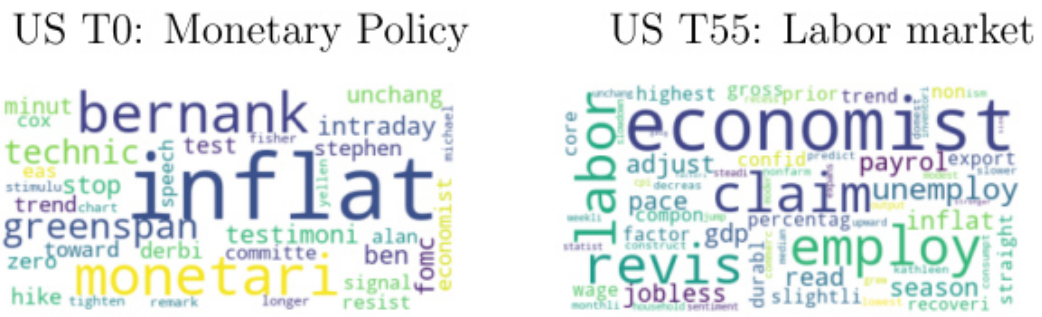
and its purpose or function. The initial function of the monetary policy narrative might have been to gain support for new and unconventional monetary policy instruments, which were justified by the extraordinariness of the situation, for which the reference to the Great Depression served as an argument. Later on, the focus of the debate about monetary policy shifted from the Fed's responsibility to fight the crisis to the Fed's accountability for its existence. At the later stage the narrative's function for members of the Fed might have been to exculpate them from the accusation that the Fed's behavior had been a cause of the crisis.

4.2 LDA-based business cycle narratives

As discussed in Section 2, it has become quite popular to use text mining techniques such as LDA in order to identify narratives in large text corpora and to analyze their impact on the economy with econometric tools. Larsen and Thorsrud (2018) is a good example for this approach. They refer to Shiller (2017) and "define the term narrative to mean a simple story or easily expressed explanation of events that many people want to bring up on news. The news-based topic model approach captures this idea, and allows us to identify what the news stories thematically are about in a parsimonious manner" (Larsen and Thorsrud 2018, p.2).

It is interesting that Larsen and Thorsrud (2018) talk of narratives that they identify with the LDA approach. In their companion paper Larsen and Thorsrud (2019), they use the same method on different data, but speak of topics instead of narratives. In fact, they argue correctly that LDA produces word clusters which are called topics. Two examples of the identified topics are shown in Figure 4.

Figure 4: Word clouds and topic categorization from Larsen and Thorsrud (2018)



The size of the word in the word cloud generated by the algorithm reflects the probability of this word occuring in the topic. The labels for the topics ("monetary policy" and "labor market") were subjectively chosen by the authors. As visible in the word clouds, the only structure in those topics is the distribution of words. The requirement of a story that a temporal sequence of events is reported, is not met. LDA can hence only discover what the news were about (i.e. the topic), but not the specific contents nor any of the other elements of our definition of narratives. Topic modelling can hence be a first step to the identification of narratives, but not more. Larsen and Thorsrud (2018) make an additional step by translating the topic decompositions into tone adjusted time series, that measure how the news reported about a topic. In order to measure the tone of the reporting, they use a word list with positive and negative words as defined by the Harvard IV-4 Psychological Dictionary.

Using these data, the authors estimate news coincident indexes for the US, Japan, and Europe and show that these news-based indexes track the state of the economy very well. They can also show that some news topics are relatively exogeneous and carry information that is helpful to predict the

evolution of TFP in the US. However, Larsen and Thorsrud (2018) do not make any claim about the causality between the identified news topics and economic activity.

In a similar fashion, Borup et al. (2020) also claim to identify narratives using LDA, albeit using a different source of data. Although they acknowledge that "a topic is not a narrative in and by itself" (Borup et al. 2020, p. 3), the authors maintain that the essence of a particular narrative can be captured by a set of keywords. We think that these kinds of analyses are valuable and provide insights into the relation between the prevalence of topics and the business cycle. However, they are quite far away from capturing our concept of economics narratives. In fact, the whole empirical analysis could have been done without the term "narrative" and using the terms "discourse" or "topics" instead. The reference to Shiller (2017) and his concept of narratives mainly serves as a motivation and an argument for the dynamics of news stories over time. This is not to say that narratives are not driving the results, but neither Larsen and Thorsrud (2018) nor Borup et al. (2020) really show the relevance of narratives directly. They analyze topics, not narratives.

5 Problems of empirical identification of narratives

We are aware of the fact that our definition of economic narratives is highly demanding for quantitative empirical research. In this section, we discuss some issues researchers face if they want to identify economic narratives with methods of statistical text analysis. Using qualitative text analysis, economic narratives are easier to discover, but this method is not applicable to the analysis of large text corpora.

The minimal requirement for a story is that the text contains a temporal sequence of events. An event means that something happens or somebody does something. Examples of economic events are:

- The Dow Jones fell.
- Toyota improved its hydrogen car.
- Prices are rising.
- National income went up.
- Consumers spend more.
- The government discusses income tax cuts.
- The central bank will raise the interest rate.

If we want to identify stories as the main element of narratives, the unit of analysis cannot be single words as in topic modelling, but should be events. A sentence that reports an event contains at least a subject (e.g. "the government") and a predicate ("discusses") and often there is also an object ("income tax cuts"). Hence research methods for the analysis of narrative must be able to identify basic grammatical structures, which is not possible with the simple bag-of-words models. It is already clear from this that the computerized analysis of narratives must be more sophisticated than topic modelling and requires more advanced methods of natural language processing.

The next step after the identification of events is to discover their temporal sequence. The smallest story consists one event occurring after another, e.g.

- The Dow Jones fell after the Fed had announced to raise the federal funds rate.
- Ben Bernake had studied the Great Depression before he became a central banker.
- The financial system will collapse, if AIG fails.

We hence have to consider markers of time in the text, which can be different tenses, but also dates or temporal adverbs like "before", "after", "then", "yesterday" etc.

In a normal text, the story is not told in a single sentence, but in several sentences. Some sentences might provide details on the events or the agents and others might present evidence or examples. The following paragraph about Ben Bernanke taken from the Encyclopedia Britannica[14] illustrates this:

> *"He became a full professor in 1985 when he moved to Princeton University, and he served as a visiting professor at both New York University and MIT. Widely published on a range of economic issues—including macroeconomics, monetary policy, the Great Depression, and business cycles—Bernanke was awarded both a Guggenheim and a Sloan Fellowship, and in 2001 he became editor of the American Economic Review. The following year he was appointed to the Board of Governors of the Fed, and he became noted for thorough research and diplomacy when opinions among the governors differed. … In 2005 Bernanke was nominated by U.S. Pres. George W. Bush to succeed Alan Greenspan as chairman of the Fed. He took office on February 1, 2006. With his strong background in academia, Bernanke represented a clear break from previous Fed chairmen, who had usually come from Wall Street. While expected to uphold the style of fiscal management established by Greenspan, he brought certain important changes to the Fed, mainly in regard to inflation. Although his predecessor rejected inflation targeting, Bernanke preferred a stated inflation objective, which he believed would bring about economic growth and stability."*

The story can be summarized easily in one sentence: "Ben Bernake was a respected academic before he became a central banker". In order to be a narrative, the story must have a specific meaning. We mentioned earlier that the fact that Bernanke had worked on the Great Depression as a scholar was interpreted to be of help during the financial crisis. Another narrative is presented in the paragraph from the Encyclopedia Britannica above. That text emphasizes the academic background because Bernanke broke with the policy style of his predecessor Alan Greenspan and replaced the fiscal management approach by inflation targeting. We could summarize this as narrative as follows:

"Ben Bernake was a respected academic who had participated in the rules-vs.-discretion debate on monetary policy before he became a central banker. As a central banker, he replaced Alan Greenspan's `just do it approach´ by inflation targeting which is supported by many monetary theorists."

While this narrative may make a lot of sense to people who are familiar with the academic debate on monetary policy in the 1990s and 2000s, non-experts probably do not know what the `rules-vs.-discretion debate´ was about and what it has to do with Alan Greenspan. Depending on who uses this narrative, it can transport a critique of the `magician´ Greenspan and his claim of being a master of the `art of monetary policy´ as opposed to the `science of monetary policy´ in the subtext. Note that we use subtext ourselves here, when we talk about "the magician", "the art of monetary policy" and "the science of monetary policy", which are not mentioned in the narrative, but may be triggered by the term "just do it approach". Our approach is clearly hermeneutic here, but we argue this is necessary in order to capture the sensemaking element of narratives. How this can be done in an automated way is a totally open question.

Once a narrative with a certain meaning has been identified somehow, it might be easier again to analyze quantitatively how often it is used and by whom. It appears possible to characterize a specific narrative by typical phrases or terms and by the tone of the text. A researcher would have to identify

[14] https://www.britannica.com/biography/Ben-Bernanke

the narrative first and then define identifying keywords. It is necessary, however, also to measure whether the tone of the text is positive or negative, because both a supporter and a critic can use the same narrative. Instead of using topic modelling, topic classification approaches might be better suited to analyse the question, which groups share the same narratives. But given that topic classification methods are established, the identification of narrative-sharing groups should not pose fundamental problems.

Detecting the emergence of a shared narrative from the interaction of individual narratives, which are all slightly different, might be a bigger challenge. One way of doing this might be to show that distinct individual or sub-group narratives have a joint core and distinguishing features. Emergence might mean that the core of the narratives incorporates more and more new elements. Furthermore, the number of distinguishing features should decline over time. The main problem is to identify which narratives are similar, but not identical. Again, this might be more a hermeneutic task than a statistical one.

It can be difficult to say whether a text suggests a certain action. In some cases, the author of a text may give a direct recommendation to do something, e.g. buy a stock or vote for a politician. These cases are easy, but relatively rare. More frequently, financial analysts do not tell their readers directly to invest in a certain company, but say that the “outlook is good'' or that there are “opportunities”. Similarly, a political commentator is unlikely to say “vote X”, but might criticize politician Y and praise politician X. The reader nevertheless can interpret this as a suggestion to buy the stock or vote X, because he or she is looking for guidance from experts. The suggestion is often implied by the type of the text: it is the function of commentaries and opinion pieces to suggest a certain action, even if it is not literally expressed in the text. In many cases, however, the suggested action cannot be found directly in the words of a narrative, but, again, in the subtext and the context in which a narrative is used. In those cases, the perceived suggestion to perform a certain action is the product of the receiver’s belief system. For example, the interpretation of the phrase “politician X wants to tax the rich more in order to finance public health care” depends on the context in which it is used and the belief system. For some readers, it may just be a factual statement without any suggestive character. However, if the phrase is used in a political context it can convey the message “vote X” or “do not vote X”, depending on whether the writer and the reader believe that the described policy is good or bad. A way how researchers can deal with this ambiguity is to categorize the text by function, context and/or authorship and to assume that some texts contain suggestions while others do not.

6 Conclusions

While a full narrative turn has not occurred yet in economics, the interest in narratives, their origins, consequences and dynamics has increased considerably in the profession as we have shown in our literature review. We regard this as a promising development in economics, not only because the topic is relevant, but also because the study of narratives entails new methods and new perspectives.

So far, however, most progress was made on the methodological side, in particular in the application of topic modelling methods and the formal modelling of narrative dynamics. The potential for a new perspective on the economy and on how to do economics is still to be realized. We contribute to this next step by offering a precise definition of collective economic narratives, which fills a gap in the existing literature. Our definition of collective economic narratives as sense-making stories shared by members of a group, which emerge in social interaction and suggest actions, is rooted in complexity economics and adds three features to existing definitions. First, we are explicit about what we mean by “story”. For us, a story is the report of a temporal sequence of events and not just a collection of terms that are somehow related. Second, we explain precisely what we mean by “sense-making” and argue that sense-making happens on the basis of people’s belief systems which consist of their

mental models of how the world functions and their value systems. Hence our approach emphasizes the inherent subjectivity of narratives, which has important epistemological and ontological implications. On the epistemological side, we have to deal with the question of what researchers can know about the sense-making process and the belief system of agents and how they can acquire such knowledge. It seems inevitable to allow for some hermeneutics in the study of narratives. Ontologically, the subjective dimension of narratives means that there is not just one, objective economy. If it is correct that economic behavior depends on narratives, which, in turn, depend on the subjective belief systems of economic agents, then economic decisions are made on the basis of how agents perceive the economy and not on how it actually is (whatever this means in this case). This leads to our third insight, which is that narratives emerge and evolve over time. At any given time there is a plethora of individual narratives about all kinds of economic issues as people try to make sense of what they observe. Social processes lead to the emergence of collective narratives which coordinate the behavior of groups and can have the power to drive the economy at the aggregate level. While it can happen that a single narrative is dominant for a while, it might be the more frequent case that multiple narratives compete and interact with each other. The emergence of collective narratives is both a cause and a consequence of the permanent evolution of the economy.

Our definition of collective economic narratives is demanding and poses considerable challenges for quantitative empirical research. One of our main messages is that topic modelling can only be a first step in the empirical analysis of narratives. As implied by the name this method identifies topics, but not narratives. If topic modelling is applied to texts from the mass media or in social media, we might be able to identify public discourses in which several narratives about the same topic compete. In order to uncover these competing narratives in a discourse, topic modelling must be complemented by other, possibly much more sophisticated methods of natural language processing and natural language inference (NLI). The latter is a rapidly moving field and state-of-the-art NLI-models are among the most complex in deep learning today[15]. Some well-established NLP-methods could drive progress in this regard even though they are not widely used in economics yet.

As the examples provided in chapter 5 show, economic narratives are often connected to institutions ("the government", "the central bank"), people ("Ben Bernanke") and economic concepts ("consumers", "prices"). When identifying narratives in a vast corpus of documents or a high volume news feed, Named Entity Recognition (NER) (Borthwick et al. 1998) can be used to pre-select interesting documents and categorize them according to the entities or concepts they pertain to. As a complementary method, Part-of-speech-tagging (POS-tagging) classifies words according to their word class (Merialdo 1994). Elements of the particular syntactic structure underlying narratives – that elude bag-of-words models by construction – can be recovered by syntax or parse trees (Marcus et al. 1993). Word embeddings attained through highly complex but pre-trained machine learning models like word2vec (Mikolov et al. 2013) can help to quantify syntactic as well as semantic relationships between terms.[16] In other words, the tools to attain a richer representation of texts and start moving towards identifying narratives instead of topics are readily available.

Research in narrative economics can benefit from the import of these and other methods and from the exchange with computer scientists and computational linguists. However, economists could also learn from cognitive and social psychologists and sociologists on how to approach individual and collective sense-making. In order to reap its full potential, narrative economics needs interdisciplinary exchange.

[15] OpenAI´s GPT-3 language model uses 175 billion parameters (see Floridi and Chiriatti (2020) for a discussion), a further testament to the level of complexity that is inherent in language.

[16] All of the aforementioned approaches are vast fields in themselves and the papers mentioned herein should be considered examples from substantive literatures.

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Appendix

Definitions of narratives in the economic literature.

Antoci et al. (2020), p. 482:

Narratives are defined at a very abstract level, and might reflect a variety of possibilities: from purely fictional accounts that for some reason have become salient to the public opinion, to narratively biased accounts of real facts, to folk economic theories (Rubin 2003), and so on.

p. 483:

We consider a society where two alternative narratives circulate for possible individual adoption. We will call them Narrative 1 and Narrative 2, respectively. Such narratives have a potential effect on individual behaviors and payoffs.

Bénabou et al. (2020), p. 1:

Narratives are stories people tell themselves and each other to make sense of human experience– that is, to organize, explain, justify, predict and in‡uence its course. They are "instruments of mind in the construction of reality"(Bruner 1991), and viewed as central features of all societies by many disciplines including anthropology, psychology, sociology, history and the humanities.

Within this very broad concept, we focus here on the sense and role of narratives as arguments, rationales or justifications. These may be objectively relevant facts (e.g., melting polar ice caps) but also political and social slogans ("Never again"), advertising pitches ("Because you are worth it"), or rationalizations such as "They are not making any more land" during real-estate bubbles (Shiller 2017). The most important narratives, however, pertain to actions with moral implications, namely those involving externalities and reputational concerns. It is on such rationales for what one "ought to do"(or not) that we focus. Accordingly, we define a moral narrative as any signal, story, or heuristic that can potentially alter an agent's beliefs about the tradeo¤ between private benefits and social costs (or the reverse) faced by a decisionmaker. The latter could be the agent himself, someone he observes, or someone he seeks to influence.

Borup et al (2020), p. 1:

This has recently changed as a result of the novel work by Shiller (2017, 2019, 2020) who coined the term "narrative economics" to describe the study of how stories, explanations, and justifications of events that we tell ourselves and others shape individuals' behavior, their decision-making, and drive economic fluctuations. In other words, prevailing narratives, which are those that go viral and spread throughout society, have the ability to determine our actions since they function as scripts to guide behavior in times of uncertainty (Schank er and Abelson, 1977).

Eliaz and Spiegler (2020), p. 3786:

Crow and Jones (2018) write: "There can be little doubt then that people think narratives are important and that crafting, manipulating, or influencing them likely shapes public policy." They add that narratives simplify complex policy issues "by telling a story that includes assertions about what causes what, who the victims are, who is causing the harm, and what should be done."

Echoing the Crow-Jones quote, our model is based on the idea that political narratives can be regarded as causal models that map actions to consequences.

Larsen and Thorsrud (2018), p. 6-7:

Here, as alluded to already, we follow Shiller(2017) and define the term narrative to mean a simple story or easily expressed explanation of events that many people want to bring up on news. We then construct measurable approximates to this definition based on the news topics the media writes about, and subsequently link those to economic fluctuations. Accordingly, we will be using the terms narrative and news (topic) interchangeably. More formally, the narrative of a story will consist of one or more news topics. To elaborate on why this approximation is reasonable, what it allows us to measure, and why it might fall short, we take inspiration from the well known cognitive psychologist Jerome Bruner, and in particular Bruner (1991).

Shiller (2017), p. 968:

I use the term narrative to mean a simple story or easily expressed explanation of events that many people want to bring up in conversation or on news or social media because it can be used to stimulate the concerns or emotions of others, and/ or because it appears to advance self-interest. To be stimulating, it usually has some human interest either direct or implied. As I (and many others) use the term, a narrative is a gem for conversation, and may take the form of an extraordinary or heroic tale or even a joke. It is not generally a researched story, and may have glaring holes, as in urban legends. The form of the narrative varies through time and across tellings, but maintains a core contagious element, in the forms that are successful in spreading. Why an element is contagious, when it may even "go viral," may be hard to understand, unless we reflect carefully on the reason people like to spread the narrative. Mutations in narratives spring up randomly, just as in organisms in evolutionary biology, and when they are contagious, the mutated narratives generate seemingly unpredictable changes in the economy.

Shiller (2019), p. 477:

The term "narrative" is often used as a synonym for "story," a sequence of events. But the word narrative has an important other aspect. A narrative is a telling of a story, that attaches meaning and significance to it, that often is intended as providing a lesson or a moral. A narrative can become an interpretation of ongoing events by comparing them with a story. With economic narratives, the narrative may represent a proto-economic model, understandable by the most general public.