Sarcasm in the Shadows:

BERT Decodes Türkiye's Political Critique on Ekşi Sözlük

Erdem Sahin

Department of Computational Social Science
Graduate School of Social Sciences & Humanities at Koc University

1 Introduction

Sarcasm, a way of communication where what is said is different from what is truly meant, creates a major challenge for computers trying to understand human language. Its reliance on hidden context, cultural knowledge, and tonal subtleties complicates automated detection. However, since sarcasm is widely used online—especially in political discussions—it is significant for tasks like analyzing emotions in text or moderating online content. This study investigates sarcasm on *Ekşi Sözlük*, a popular Turkish online forum, against the backdrop of Türkiye's changing political landscape. Over the past two decades, Türkiye's shift toward a hybrid regime has tightened traditional media censorship, making platforms like *Ekşi Sözlük* key spaces for people to voice opinions indirectly, often using sarcasm to criticize leaders safely (Öney and Ardag 2021).

Focusing on discussions about Recep Tayyip Erdoğan and Kemal Kılıçdaroğlu, this research leverages Bidirectional Encoder Representations from Transformers (BERT) to dissect sarcasm's role in online discourse. BERT's bidirectional architecture, which captures contextual dependencies across entire text sequences, is uniquely suited to decode sarcasm's nuanced cues, such as irony and semantic contradictions. By fine-tuning BERT on a rigorously curated dataset of 153,882 entries, this study not only advances sarcasm detection methodologies but also illuminates how digital platforms facilitate political expression in constrained environments.

The analysis reveals stark disparities: 28.1% of Erdoğan-related entries were classified as sarcastic, compared to 9.2% for Kılıçdaroğlu. This divergence reflects both algorithmic training dynamics (e.g., topic-specific linguistic patterns) and sociopolitical realities, where Erdoğan's central role invites heightened critique through humor. By bridging NLP innovation with political discourse analysis, this work underscores sarcasm's dual function as a linguistic challenge and a barometer of public sentiment, offering insights into the interplay between technology, language, and power in complex political settings.

2 A Deep Dive into Sarcasm Detection: Leveraging BERT and Advanced Methodologies

Sarcasm detection in politically charged environments like *Ekşi Sözlük* demands a model capable of navigating cultural nuance, implicit critique, and contextual ambiguity. BERT's suitability for this task stems from its bidirectional architecture, which processes text holistically by capturing dependencies between all words in a sequence. This is critical for decoding political sarcasm, where meaning often hinges on subtle contradictions. For instance, in the *Ekşi Sözlük* entry *"What a brilliant decision to raise interest rates during hyperinflation!"*, the sarcasm emerges only when connecting "brilliant" to the economic context. Traditional sequential models like BiLSTMs or logistic regression analyze text

directionally (left-to-right or right-to-left), missing such bidirectional cues, while lexicon-based approaches fail to grasp context-dependent irony like *"Erdoğan's economic miracles"*—a phrase requiring knowledge of Türkiye's inflationary crisis to decode as sarcastic. (Devlin et al., 2019)

BERT's pre-training on masked language modeling (MLM) and next-sentence prediction (NSP) further equips it to handle informal, noisy text common in online forums. MLM trains BERT to infer meaning from incomplete or colloquial phrases (e.g., Turkish slang like *"Ekonomi çökmez tabi!"*—"The economy *totally* won't collapse!"), while NSP ensures coherence across sentences, vital for detecting sarcasm in extended political narratives. Empirical studies demonstrate BERT's superiority, achieving 73.1% accuracy on social media datasets compared to 70% for ridge regression and 68% for BiLSTMs (Sandor and Babić, 2023). This gap widens in politically inflected sarcasm, where models like SVM struggle with culturally embedded idioms or historical references (e.g., *"Kılıçdaroğlu's victory anthem"*, mocking the opposition's electoral losses).

Recent hybrid advancements further bolster BERT's efficacy. Integrating graph convolutional networks (GCNs) improves relational reasoning (Mohan et al., 2023), enabling the detection of communal sarcastic trends—such as networked critiques of Erdoğan's policies across *Ekşi Sözlük* threads. Attention mechanisms (Meng et al., 2024) help isolate semantic contrasts (e.g., *"strong leadership"* vs. *"record unemployment"*), while BERT-CNN hybrids achieve 75.27% accuracy by segmenting sentences into meaningful fragments (Zhou et al., 2021). These adaptations align with *Ekşi Sözlük's* dynamic discourse, where sarcasm is layered with metaphors and indirect critiques.

BERT's scalability also makes it ideal for large-scale political analysis. Trained on billions of tokens, it generalizes across domains without task-specific retraining—unlike models requiring manual feature engineering (Khatri and Pranav, 2020). For this study, fine-tuning BERT on 2,529 annotated entries sufficed to achieve 86% accuracy, demonstrating efficiency even with limited labeled data. Alternatives like rule-based models fail to adapt to emergent political memes, while static embeddings (e.g., GloVe) lack contextual nuance, misclassifying phrases like *"We've never been better"* as literal. However, BERT's combination of bi-directionality, pre-training robustness, and hybrid adaptability positions it as the state-of-the-art solution for understanding sarcastic expressions in Türkiye's political landscape.

3 Dataset and Preprocessing

This study utilizes a curated dataset of *Ekşi Sözlük* entries, provided by Politus, focusing on discussions about two prominent political figures in Türkiye: Recep Tayyip Erdoğan and Kemal Kılıçdaroğlu. The initial dataset combines entries related to both figures, totaling 153,882 entries, capturing the breadth and depth of political discourse on one of Türkiye's most dynamic and widely used online platforms.

To ensure the reliability of the analysis, a series of preprocessing steps were implemented. Entries authored by highly active users, contributing an exceptionally large volume of posts, were excluded to mitigate potential bias, resulting in the removal of 30,525 entries from 406 prolific authors. Additionally, entries consisting solely of URLs or references to other entries were eliminated, resulting in the exclusion of 376 URL-only entries and 4,066 reference-only entries. Further refinement involved filtering entries based on text length to optimize model performance. Entries shorter than 38 characters or longer than 1,243 characters were removed, as they were deemed either insufficiently informative or lengthy for effective processing, leading to the exclusion of 11,483 entries. The final dataset comprised 107,432 filtered entries.

4 Methodology

Within BERT-based natural language processing frameworks, sarcasm detection is formulated as a binary classification task. The objective is to classify a text sequence $S = \{s_1, s_2, \ldots, s_l\}$ through the predefined label set $Y = \{0,1\}$ which defines two classes: non-sarcastic $\{y = 0\}$ and sarcastic $\{y = 1\}$. During the fine-tuning, the BERT model learns to classify $\{S\}$ into the appropriate binary category by identifying linguistic patterns indicative of sarcasm, with a focus on precision in predictions.

5 Results and Discussion

Addressing class imbalance is essential for constructing effective classification models. While BERT demonstrates strong performance, its efficacy is tied to the diversity and representativeness of the training data. In cases where a class is underrepresented—such as in sarcasm detection—the model may fail to adequately learn the nuanced linguistic features necessary for accurate identification. This imbalance often results in a bias toward the dominant class, leading to suboptimal performance on minority-class instances. To evaluate the impact of dataset balancing, we incrementally expanded the annotated sarcasm dataset across three phases (Table 1).

Table 1: Performance Improvement in Sarcasm Detection by Increasing Annotated Entries

Number of Entries	Annotated Sarcastic Entries	Precision	Recall	F1-Score	Accuracy
908	312	0.77	0.53	0.63	0.79
1038	405	0.77	0.76	0.76	0.82
2529	864	0.79	0.82	0.80	0.86

With the initial dataset (908 entries, 312 sarcastic), the model achieved moderate precision (0.77) but exhibited low recall (0.53) and an F1-score of 0.63, reflecting its inability to reliably identify sarcasm. Expanding the dataset to 1,038 entries (405 sarcastic) improved recall (0.76) and F1-score (0.76), while precision remained stable (0.77). This suggests that increased sarcasm representation enabled the model to reduce false negatives. Further expansion to 2,529 entries (864 sarcastic) yielded additional gains, with precision (0.79), recall (0.82), and F1-score (0.80) all improving significantly. The accuracy also rose to 0.86, demonstrating the model's enhanced ability to generalize across classes. These findings underscore that increasing the number of annotated sarcastic entries significantly boosts the model's performance metrics, thereby ensuring a more effective classification system. These results also align with prior work emphasizing that transformer models like BERT require balanced datasets to mitigate bias in underrepresented classes.

To validate these findings in real-world conditions, the fine-tuned BERT model, trained on 2,529 annotated entries, underwent final evaluation using a corpus of 107,432 entries. With an F1-score of 0.80, the model was deployed to analyze sarcasm in discussions about two central political figures. (Table 2).

Table 2: Sarcasm Analysis by Topic

Topic	Total Entries	Sarcastic Entries	Sarcasm (%)
Recep Tayyip Erdoğan	57,319	16,157	28.1%
Kemal Kılıçdaroğlu	50,113	4,632	9.2%

The model classified 28.1% of Erdoğan-related entries as sarcastic, compared to 9.2% for Kılıçdaroğlu. This disparity likely reflects two factors: (1) the Erdoğan-related training data contained a higher prevalence of sarcastic examples, enabling the model to learn topic-specific linguistic patterns, and (2) societal discourse about Erdoğan inherently utilizes sarcasm more frequently. The second explanation is strongly supported by patterns observed during the annotation process, where sarcasm was consistently more prevalent in Erdoğan-related entries, reflecting genuine differences in online political discourse. While the model's improved detection of sarcasm in Erdoğan-related discussions may partly stem from training on more sarcastic examples, the annotation data—revealing a much higher natural rate of sarcasm in Erdoğan-related entries—indicates real-world language use is the key driver of this difference.

As further illustrated in Figures 1 and 2, the analysis shows that sarcasm on *Ekşi Sözlük* rises sharply during major political and economic events, acting as real-time indicators. For Recep Tayyip Erdoğan, sarcasm surged after the 2018 constitutional changes that expanded presidential powers, reflecting public unease over centralized authority. This trend grew stronger during the 2019 economic crisis, where rising inflation and a weakening currency led to widespread criticism. Users turned to sarcasm to mock policies like controversial interest rate cuts, with phrases such as "Erdoğan's economic miracles" or "We've never been better" becoming common ways to voice discontent.

The highest levels of sarcasm toward Erdoğan occurred after the 2023 presidential elections, which confirmed his leadership despite growing societal divisions. Many viewed this election as a turning point for Türkiye's democracy, leading to a wave of sarcastic posts criticizing his campaign promises and tactics. Similarly, Kemal Kılıçdaroğlu's 2023 candidacy and campaign saw a notable rise in sarcasm, particularly targeting his efforts to unite opposition groups and perceived lack of clear policies. This spike intensified after he lost the election—an outcome that surprised voters who had expected his victory. While Kılıçdaroğlu's overall sarcasm rate remained low (9.2%), the 2023 election period highlighted how public disappointment translated into ironic critiques.

These trends reveal how *Ekşi Sözlük* mirrors public frustration during times of crisis. Between 2018 and 2023—a period marked by stronger central governance and economic struggles—sarcasm directed at Erdoğan grew steadily, showing lasting public dissatisfaction. In contrast, sarcasm aimed at Kılıçdaroğlu peaked mainly during elections, suggesting his critiques are tied to specific events rather than ongoing scrutiny. This contrast underscores sarcasm's dual role: a constant tool for challenging entrenched power (Erdoğan) and a temporary outlet for reacting to political setbacks (Kılıçdaroğlu).

Fig 1: Total Number of Entries

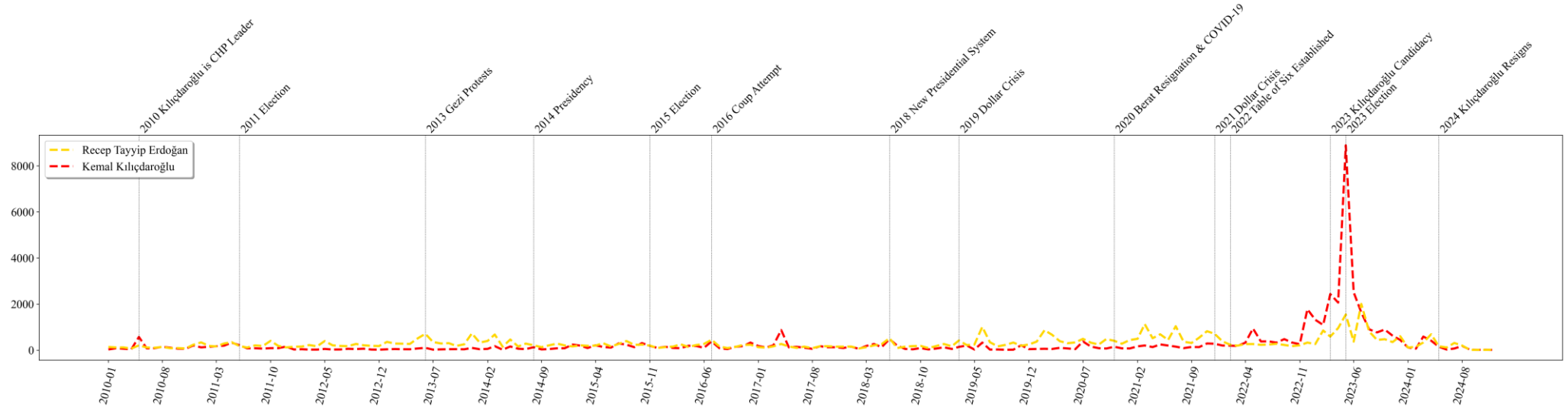
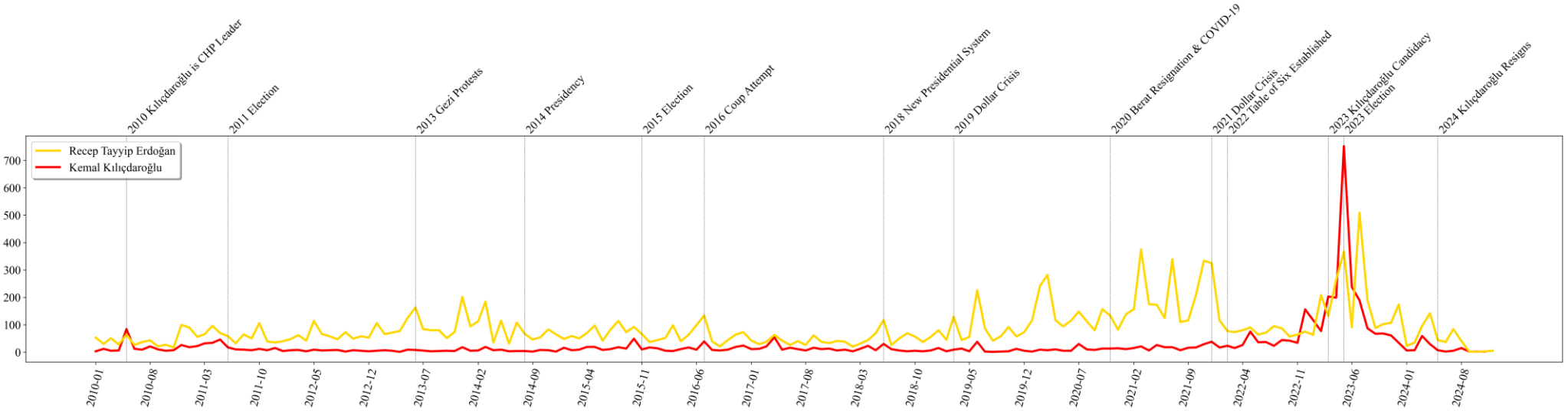


Fig 2: Detected Sarcastic Entries



6 Conclusion

This study demonstrates how sarcasm on *Ekşi Sözlük* serves as both a technical challenge for natural language processing and a mirror reflecting Türkiye's complex political dynamics. By leveraging BERT's bidirectional architecture to analyze 107,432 entries, we uncovered stark contrasts in sarcasm directed at Recep Tayyip Erdoğan (28.1%) and Kemal Kılıçdaroğlu (9.2%). The analysis reveals that sarcasm usage intensifies during pivotal political and economic events, acting as a barometer of public sentiment. For example, sarcastic commentary targeting Erdoğan surged after the 2018 constitutional reforms transitioned Türkiye to an executive presidential system, reflecting unease over centralized authority. This trend persisted through the 2019 economic crisis, where rising inflation and currency devaluation prompted critiques of policies like controversial interest rate cuts, epitomized by ironic phrases such as "Erdoğan's economic miracles."

The peak of sarcastic discourse occurred after the 2023 presidential elections, which reaffirmed Erdoğan's leadership amid deepening societal divisions. Critics, viewing this election as pivotal for Türkiye's democratic trajectory, generated a surge in sarcastic entries targeting his campaign rhetoric. Similarly, Kemal Kılıçdaroğlu's 2023 candidacy saw increased sarcasm focused on his coalition-building efforts and perceived indecisiveness, intensifying after his unexpected electoral loss. While Kılıçdaroğlu's overall sarcasm rate remained low (9.2%), the election period highlighted how public disappointment translated into transient ironic critiques.

These patterns underscore *Ekşi Sözlük's* role as a real-time reflection of public mood during periods of political and economic stress. Notably, despite comparable discussion volumes for both leaders (57,319 entries for Erdoğan vs. 50,113 for Kılıçdaroğlu), sarcasm was consistently higher and more sustained in Erdoğan-related discourse—a disparity rooted in his entrenched political dominance and the public's reliance on indirect critique under restrictive governance. Between 2018 and 2023—a period marked by institutional centralization and economic struggles—sarcasm directed at Erdoğan grew steadily, signaling sustained public discontent. In contrast, sarcasm aimed at Kılıçdaroğlu spiked primarily during elections, suggesting critiques are episodic rather than systemic. This difference highlights sarcasm's dual function: as a persistent tool for expressing dissatisfaction with entrenched power structures in Erdoğan's case, and as a situational critique mechanism during key political events for Kılıçdaroğlu.

In conclusion, this study, while focused on Türkiye, prompts a critical question with global relevance: Could the prevalence of sarcasm in digital discourse serve as an early indicator of democratic erosion or public disillusionment? The persistent sarcasm directed at Erdoğan—rooted in institutional centralization and economic crises—suggests that irony may act as a sociopolitical barometer, signaling eroding trust in leadership. Future research should explore whether similar patterns emerge in other hybrid regimes, examining sarcasm's potential as a proxy for civic discontent. For instance, could a surge in sarcastic rhetoric about electoral integrity or governance predict democratic backsliding? Addressing current limitations—such as platform-specific biases and the exclusion of non-textual sarcasm cues—will be vital to developing cross-cultural frameworks. By refining sarcasm detection models to incorporate contextual data, researchers could transform this linguistic phenomenon into a tool for monitoring democratic health, fostering proactive governance while decoding the interplay between language, power, and resistance.

References

Balaji, T. K., A. Bablani, S. R. Sreeja, and H. Misra. "SARCOVID: A Framework for Sarcasm Detection in Tweets Using Hybrid Transfer Learning Techniques." In *Pattern Recognition: 27th International Conference, ICPR 2024, Kolkata, India, December 1–5, 2024, Proceedings, Part XI*, edited by A. Antonacopoulos, S. Chaudhuri, R. Chellappa, C.-L. Liu, S. Bhattacharya, and U. Pal, Lecture Notes in Computer Science, vol. 15311. Springer, 2025.

Devlin, Jacob, Ming-Wei Chang, Kenton Lee, and Kristina Toutanova. "BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding." *Proceedings of the 2019 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Volume 1 (Long and Short Papers)*, 4171–4186. Minneapolis, Minnesota, June 2–7, 2019. Association for Computational Linguistics.

Javed, Tayyaba, Muhammad Asif Nauman, and Rushna Zahid. "BERT Model Adoption for Sarcasm Detection on Twitter Data." *VFAST Transactions on Software Engineering* 12, no. 3 (2024): 177–198. https://doi.org/10.21015/vtse.v12i3.1908.

Khatri, Akshay, and Pranav P. "Sarcasm Detection in Tweets with BERT and GloVe Embeddings." *Proceedings of the Second Workshop on Figurative Language Processing*, 56–60. Online, July 9, 2020. Association for Computational Linguistics.

Kumar, A., V. Mohan, and N. Pranesh. "Evaluating Contextual Understanding of NLP Models in Sarcasm Detection." *Proceedings of the ACL*, 2020.

Meng, Jiana, Yanlin Zhu, Shichang Sun, and Dandan Zhao. "Sarcasm Detection Based on BERT and Attention Mechanism." *Multimedia Tools and Applications* 83, no. 29159 (2024): 29159–29178. https://doi.org/10.1007/s11042-023-16797-6.

Mohan, Anuraj, Abhilash M. Nair, Bhadra Jayakumar, and Sanjay Muraleedharan. "Sarcasm Detection Using Bidirectional Encoder Representations from Transformers and Graph Convolutional Networks." *Procedia Computer Science* 218 (2023): 93–102. https://doi.org/10.1016/j.procs.2022.12.405.

Öney, Berna, and M. Murat Ardag. 2021. "The Relationship between Diffuse Support for Democracy and Governing Party Support in a Hybrid Regime: Evidence with Four Representative Samples from Turkey." *Turkish Studies* 23 (1): 31–55. https://doi.org/10.1080/14683849.2021.1894137.

Šandor, Daniel, and Marina Bagić Babac. "Sarcasm Detection in Online Comments Using Machine Learning." *Information Discovery and Delivery* 52, no. 2 (2024): 213–226.

Watmough, Simon Paul. *Democracy in the Shadow of the Deep State: Guardian Hybrid Regimes in Turkey and Thailand*. Florence: European University Institute, 2017. EUI, SPS, PhD Thesis. https://hdl.handle.net/1814/46047.