The economic theory of democracy in the digital age: modelling Deep Anchoring and virtual citizenship in algorithmic environments

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Abstract
While digital technologies have accelerated access to information, they have also fundamentally reshaped the cognitive architecture of democratic decision-making. This paper proposes an extension of the economic theory of democracy to account for the behavioral, algorithmic, and media-driven transformations of political choice in the digital era. Building on classical models (Downs, Mill, Schumpeter, Rawls), we argue that the informational logic of democracy has shifted from rational deliberation to cognitively anchored simulation, driven by algorithmically personalised content and emotionally charged narratives. The paper introduces two new conceptual tools – *Deep Anchoring* and *Virtual Anchoring Bias* – to describe how voters form and resist change in political attitudes under conditions of simulated reality. We develop a hybrid theoretical framework called the *Economic Theory of Virtual Democracy*, integrating insights from political economy, behavioral economics, media studies, and cognitive psychology. Methodologically, we outline a mixed-method research design for Georgia, combining macro-level electoral and internet-access data, content analysis of party communication on social media, micro-analysis of bot-like accounts, and an experimental protocol that operationalises a new measurement tool – the *Deep Anchoring Index (DAI)* – to quantify the rigidity of political judgements after exposure to manipulated social media content. Although empirical data collection is still in progress, the paper's contribution is twofold: (1) a conceptual reframing of democratic choice in algorithmic environments, and (2) a transparent methodological blueprint for measuring anchoring-driven vulnerabilities in transitional democracies. Our work aims to inform future research on algorithmic governance, "smart(er)" citizenship, and the risks of simulated democratic participation.

Keywords: Smart democracy; digital citizenship; algorithmic media; anchoring bias; virtual democracy; Georgia.

1. Introduction
Classical economic theories of democracy were developed in an analogue information environment. Voters were assumed to process a relatively limited amount of political information, acquired through traditional media, interpersonal communication, and party campaigns. Under these conditions, seminal works by Downs, Schumpeter, Mill and Rawls conceptualised democracy as a system in which citizens form preferences and cast votes based on some combination of self-interest, values, and normative deliberation [1,2,3,4]. Even when bounded rationality was acknowledged, the underlying architecture of political choice was still understood as grounded in *relatively stable informational inputs* and *observable institutional structures*.

In the twenty-first century, this informational environment has radically changed. Digital platforms have introduced unprecedented abundance, speed, and personalisation of political content. Social media feeds, recommendation algorithms and bot-generated narratives now mediate citizens' political perceptions in real time. Modern technologies and artificial intelligence are used to shape public opinion [5]. In this setting, the classical assumption that voters simply "update beliefs" in response to new information becomes insufficient. Instead, political judgements increasingly emerge as the outcome of *anchored cognition* in simulated informational spaces [6,7,8,9].

This paper argues that to understand democracy in the digital age, we must extend the economic theory of democracy by explicitly modelling how cognitive biases, algorithmically filtered media, and simulated narratives jointly shape political behaviour [10]. Artificial intelligence, especially Deep Learning, could have an even greater potential, thus surpassing that of previous technologies [11]. We focus on two new concepts – *Deep Anchoring* and *Virtual Anchoring Bias* – and propose a hybrid theoretical framework, the *Economic Theory of Virtual Democracy*, that captures how citizens' political positions are formed, reinforced, and rendered resistant to change in algorithmic environments.

Empirically, we situate our framework in the context of Georgia, a transitional democracy with high internet penetration, intense political polarisation, and visible influence of bot networks and "troll factories". While the empirical work is ongoing, we present a detailed research design and, in particular, a new measure – the *Deep Anchoring Index (DAI)* – intended to quantify the rigidity of political attitudes under conditions of informational manipulation.

The paper is structured as follows. Section 2 revisits the economic theory of democracy and outlines the limits of classical models in the digital context. Section 3 introduces the concepts of Deep Anchoring and Virtual Anchoring Bias and develops the Economic Theory of Virtual Democracy. Section 4 presents the mixed-method research design, with a focus on the DAI experiment and social media analysis. Section 5 discusses expected contributions and implications for Georgia and other transitional democracies, followed by a brief conclusion and avenues for further research.

2. Classical Economic Theories of Democracy and Their Limits in the Digital Era

The economic theory of democracy is typically associated with Downs' model of rational voters and office-seeking parties, Schumpeter's competitive elitism, and later normative extensions by Mill and Rawls. In these frameworks:

- Voters are assumed to have reasonably stable preferences and to process political information in a more or less rational way, even if imperfectly.
- Parties are modelled as strategic actors who compete for votes by offering policy bundles.
- Media plays a role as an intermediary, but not as an active algorithmic agent that selectively filters and shapes individual information streams.

In Downs' framework, the voter weighs expected utility from different party platforms, updates beliefs in response to information, and makes a choice that maximises expected benefit. Schumpeter emphasises competition among elites but still assumes that citizens choose between alternatives with some relation to interests and values. Mill and Rawls focus more on the developmental and justice-based aspects of democracy, highlighting how democratic institutions can foster individual autonomy, moral reasoning and public reason.

All of these models presuppose an information environment where:

1. Content is relatively limited and shared (a "common public sphere"),
2. Signals are noisy but not fully personalised,
3. Cognitive biases exist but are not systematically amplified by algorithms.

The digital age undermines these premises in at least three ways:

- **Abundance and choice overload:** Citizens face a near-infinite stream of information, intensifying the "paradox of choice" [12] and making selective attention more important than full information.
- **Algorithmic personalisation:** Platforms curate content based on prior engagement, reinforcing pre-existing attitudes and creating echo chambers.
- **Synthetic narrative production:** Bots, troll networks and coordinated campaigns produce *simulated* political narratives that may lack grounding in real events, but still generate emotional and behavioural responses.

In such conditions, the rational-updating assumption becomes unrealistic. Instead, cognitive anchors – initial impressions, emotionally salient narratives, and identity-laden frames – play a disproportionate role in shaping political attitudes and behaviour. To capture this, we turn to behavioural economics and cognitive psychology.

3. Deep Anchoring, Virtual Anchoring Bias and the Economic Theory of Virtual Democracy

Tversky and Kahneman's anchoring-and-adjustment heuristic describes how individuals make judgements starting from an initial reference point (anchor) and then adjust insufficiently in light of new information [13]. In the digital context, anchors are often generated by highly salient political narratives, memes, or emotionally charged posts, which can be propagated algorithmically [14].

We define **Deep Anchoring** as a strengthened form of anchoring in which the initial framing of a political issue becomes so cognitively entrenched that subsequent information – even when contradictory, factual, or highly salient – leads to minimal or no adjustment in final judgement. Deep Anchoring is thus characterised by:

- strong emotional investment,
- repeated exposure to similar messages,
- reinforcement through algorithmic filtering and social validation.

Virtual Anchoring Bias refers to the systematic distortion of political judgements caused by anchors that are themselves products of *simulated or manipulated realities* in digital media – e.g., coordinated disinformation campaigns, bot-generated narratives, deepfakes, or artificially amplified content.

In contrast to "normal" anchoring based on real but partial information, Virtual Anchoring is rooted in *constructed narratives* that may have weak or no grounding in actual policy debates or material conditions. Yet, because these narratives are made salient and repeatedly visible, they function psychologically as if they were "real".

We propose a hybrid theoretical framework – the **Economic Theory of Virtual Democracy** – that integrates:

- **Institutional structure** of democracy (parties, elections, rules of competition);
- **Behavioural constraints** (anchoring, limited attention, emotional bias);
- **Algorithmic environment** (social media platforms, recommendation systems, bot networks).

Within this framework:

- Political choice is no longer simply a mapping from preferences and information into votes, but a product of *cognitive anchoring within algorithmically structured information fields*.
- Economic interests and ideological positions are mediated by virtual narratives that may simulate, distort or replace substantive policy content.
- Democratic participation risks becoming *simulated*: formal procedures are maintained, but the underlying cognitive processes are shaped by virtual anchors rather than informed judgement.

3.4 Hypotheses

For empirical application in Georgia, we formulate the following working hypotheses:

- **H1:** Citizens who are more active in digital spaces are more likely to exhibit Virtual Anchoring Bias and show lower propensity to revise political positions after exposure to new information.
- **H2:** Deep Anchoring leads to the formation of ideologically hardened groups whose choices are based on simulated value narratives rather than on consistent economic interests.

These hypotheses guide the methodological design presented in the next section.

4. Research Design and the Deep Anchoring Index (DAI)

The proposed empirical strategy combines macro-level data, qualitative content analysis, micro-level social media analysis, and an experimental component. While data collection is ongoing, this section presents the methodological blueprint, which is itself a core contribution of the paper.

4.1 Mixed-Methods Approach

The study employs a mixed-method design in order to:

- capture broad behavioural patterns in electoral dynamics,
- understand the content and emotional tone of political communication,
- identify micro-patterns of message replication and visual manipulation,
- and measure individual-level susceptibility to Deep Anchoring.

4.2 Quantitative Component: Electoral and Internet Data (Georgia, 2012–2024)

The quantitative macro component examines:

- voter turnout and party support dynamics across national elections (2012–2024),
- internet access and usage indicators over the same period,
- correlations between the spread of internet use and patterns of party volatility or polarisation.

The aim is not causal identification at this stage, but pattern detection: do shifts in digital connectivity coincide with greater stability/instability in political preferences, or with the rise of emotionally polarised parties?

4.3 Content Analysis of Party Communication

The qualitative component applies systematic content analysis to party messages on platforms such as Facebook, YouTube and others, focusing on pre- and post-electoral periods (e.g., three months before and one month after elections).

Messages are coded by:

- Topic (economy, security, social policy, etc.),
- Emotional tone (positive / negative / neutral),
- Strategic intent (mobilisation, delegitimisation, persuasion),
- Argument type (factual, emotional, disinformative),
- Format (text, image, video, meme, hybrid).

This allows construction of *communication profiles* for major parties, comparing the dominance of rational policy content versus emotive or simulated narratives.

4.4 Experimental Design and the Deep Anchoring Index (DAI)

The core methodological innovation is an experimental protocol designed to measure Deep Anchoring.

Scenario structure:

1. **Initial Framing:** Participants are presented with information about a political or socio-economic event framed either positively or negatively. They rate their initial evaluation on a 1–10 scale (1 = very negative, 10 = very positive).
2. **Decision Options:** Participants are informed that several political decisions (A, B, C) are being considered in response to this event.
3. **Social Media Simulation:** Participants are exposed to a simulated social media feed (e.g., stylised "Facebook posts") that re-frame the event with additional spin (strengthening, reversing, or complicating the original frame).
4. **Final Evaluation:** Participants again evaluate the event on the same 1–10 scale and indicate a preferred political response option.

Deep Anchoring Index (DAI)
The DAI is defined as:

$$DAI = \frac{1 - (I - F)}{9}$$

where:

- I = initial evaluation (1–10),
- F = final evaluation (1–10),
- 9 is the maximum possible difference on the scale (10 − 1).

Thus:

- DAI≈1 indicates *strong deep anchoring* (no or minimal change in evaluation);
- DAI≈0 indicates *no anchoring* (maximum change in evaluation).

DAI can be computed for:

- different demographic groups (age, education, region),
- different party identification groups,
- different platform types (content styled as Facebook vs TikTok, etc.),
- different message types (emotional vs factual; text-only vs visual).

This makes DAI a flexible tool to quantify how resistant citizens are to updating their political judgements after exposure to additional (possibly corrective) information.

4.5 Micro-Analysis of Social Media Accounts

The study further examines patterns of message repetition and visual manipulation across social media:

- frequency of repeated messages or narratives,
- replication style (verbatim copying vs rephrasing vs meme transformation),
- use of visual manipulation (images, graphics, emotional facial expressions, symbolic colours).

Posts and videos are coded along dimensions such as:

- post ID,
- main message,
- repetition (yes/no),
- replication type,
- presence of visual manipulation (yes/no).

This micro-analysis aims to identify bot-like behaviour [12] and to characterise how simulated narratives are constructed and reinforced.

5. Expected Contributions and (Expected) Results

Because data collection and experimental implementation are ongoing, this paper positions itself primarily as a *conceptual and methodological contribution*.

We expect to contribute in three main ways:

1. **Theoretical reframing:** by articulating the Economic Theory of Virtual Democracy and grounding it in behavioural and media theory, we offer a lens for understanding how algorithmically structured information environments transform democratic choice.
2. **Conceptual innovation:** by defining Deep Anchoring and Virtual Anchoring Bias, we extend the anchoring literature from individual judgements to politically relevant, media-mediated contexts.
3. **Measurement and methodology:** the Deep Anchoring Index (DAI) and the associated experimental protocol provide a transparent and replicable way to operationalise the rigidity of political attitudes under simulated social media conditions.

In the Georgian context, we expect to observe:

- relatively high DAI values among heavy social media users,
- stronger deep anchoring in response to emotionally polarising content,
- communication profiles of parties that increasingly rely on emotional and delegitimising narratives as internet penetration grows,
- evidence that simulated narratives can override or distort economic self-interest in political choices.

These expectations remain to be tested empirically, but they illustrate the analytical potential of the proposed framework.

6. Implications for Smart(er) Citizenship and Democratic Resilience in Georgia

The Georgian case is particularly instructive. On the one hand, formal democratic institutions exist, party competition is present, and internet access is widespread. On the other hand, the informational environment is heavily influenced by bot networks, troll factories, and polarised media, which raises questions about the substantive quality of democratic choice.

If Deep Anchoring and Virtual Anchoring Bias are empirically confirmed at significant levels, this would imply that:

- **Democratic participation is at risk of becoming simulated**: citizens formally vote, but their cognitive environment is structured by virtual anchors that can be strategically manipulated.
- **Policy debate is displaced by narrative conflict**: emotional and identity-based cues overshadow economic and policy-based reasoning.
- **Vulnerability to disinformation increases**: rigidly anchored groups become less responsive to corrective information or fact-checking.

Policy and educational responses would need to include:

- media literacy and critical thinking education,
- public awareness campaigns about algorithmic curation and disinformation,
- regulatory debates on transparency of digital political advertising and platform accountability,
- academic and civil society monitoring of bot and troll activity.

Georgia, as a small but highly connected democracy, offers a microcosm in which to study the global problem of simulated democratic participation.

7. Conclusion and Future Research

This paper has outlined a conceptual and methodological agenda for extending the economic theory of democracy into the digital age. By foregrounding the roles of Deep Anchoring, Virtual Anchoring Bias, and algorithmic media, we argue that democratic choice in contemporary environments cannot be fully understood within classical rational-choice or institutional frameworks alone.

The proposed Economic Theory of Virtual Democracy integrates institutional, behavioural and media dimensions. The Deep Anchoring Index (DAI) and the broader research design provide concrete tools for empirically assessing how resistant citizens' political judgements are to updating after exposure to new information.

Future research will involve:

- implementing the full experimental protocol in Georgia,
- collecting and analysing content and micro-level social media data,

- statistically testing the hypotheses formulated in this paper,
- comparing results across demographic groups and possibly across countries.

Ultimately, our aim is to contribute to a more nuanced understanding of how digital infrastructures shape democratic life and to provide analytical tools that can support strategies for strengthening smart(er) citizenship and democratic resilience in the face of simulated realities.

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