

State crisis theory: A unification of institutional, socio-ecological, demographic-structural, world-systems, and peace and conflict research

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[11,510 words].

Abstract

Today's ecological and political instability has renewed interest in how similar problems have arisen in the past – and how they have been resolved. But current research remains divided along different research traditions. Here, I draw together five broad research strands: neo-institutionalism, socio-ecological systems, demographic-structural theories, world-systems approaches, and peace and conflict research. I begin by establishing that each of these five traditions proposes to explain state crisis, in the sense of a decisive turning point from which the state might not emerge in its current form. But each of the five strands proposes a slightly different set of hypotheses, and adduces a slightly different set of cases in support. To unify these into a single theory, I set out a typology of the various ecological and institutional drivers of state crisis, and identify four broad social responses: reform; entrenchment of elites; breakdown of the state; and collapse. Thanks to this typology, I draw attention to a neglected distinction between crises that take place in different ecological-economic conditions, with crises that occur in conditions of worsening scarcity hypothesised to have very different causes and trajectories to crises that occur in conditions of sufficiency. But beyond this fundamental scarcity/sufficiency distinction, I find no other outright contradictions between different hypotheses. Compiling these into a unified state crisis theory establishes a framework for testing these competing, but entirely compatible, hypotheses.

1. Introduction

The last decade has seen more political instability, more social polarisation, and a growing realisation that natural resources and sinks are finite. This has renewed research across academic disciplines into states that have undergone periods of conflict, growing inequality, and resource degradation in the past. But this research remains divided along different research traditions. The purpose of this paper is to draw together these different research strands, constructing a much needed interdisciplinary synthesis of five broad literatures.

First, neo-institutionalists (NIN) examine the institutional trajectories of states, wherein crises are thought to arise both from systemic institutional processes and from shocks that provoke institutional change (North et al 2009; Acemoğlu and Robinson 2012; Jessop 2015; Van Bavel 2016; Thelen and Conran 2016; Gerschewski 2021). Second, socio-ecological systems (SES) researchers examine the collapse, or loss of resilience, of states in terms of a lasting breakdown of cultural and productive processes, population, and resource acquisition (Renfrew 1984; Tainter 1988; Gunderson and Holling 2002; Cumming and Peterson 2017; Scheffer et al. 2021). Third, demographic-structural theory and its variants (DST) focus particularly on changes in population and demographic structure as factors in the political instabilities which herald state crisis (Goldstone 1991; Turchin and Nefedov 2009; Turchin 2016). Fourth are world-systems approaches (WSA) that examine the rise and decline of different hegemonic states within the rise and decline of broader systems of tribute and trade (Wallerstein 1974a; Abu-Lughod 1989; Modelski 1987; Gills 1993; Arrighi 2010 [1994]; Hornborg 2000; Chew 2007; Moore 2015). Fifth are peace and conflict researchers (PCR) who investigate the conditions for peace and the causes of conflict in modern states (King and Zheng 2001; Stewart 2005;

Fearon and Laitin 2003; Collier and Hoeffler 2004; Cederman et al 2013; Goldstone et al. 2010; Hillesund 2021).

Across each of these five literatures, the state is broadly conceived as a political apparatus with coercive power over a population within some territory. State crises occur when that political apparatus state is seriously challenged, and there is a strong chance that the state will not persist in its current form. Dramatic outcomes of state crises include violent breakdown and collapse. To the extent that a state loses the power to coerce the population within its territory, it also loses the very characteristics required to be defined as a state. But state crises do not inevitably imply catastrophic outcomes. Crises are still crises even when catastrophe is avoided; dictionaries define the term 'crisis' as a decisive turning point when change might also be averted, or when change might be for the better (Flower 2010: ix). Across these five literatures, entrenchment and reform are thus also potential outcomes of state crisis, alongside the potential for breakdown and collapse.

Generally speaking, then, theories of state crisis address two broad questions. First, why do crises take place? Second, why do crises have different outcomes? I here construct a unified theory within which different hypotheses can be formulated with sufficient clarity that they can be empirically tested. I systematise a more diverse range of literatures than has previously been done, and though I could not claim to have compiled a comprehensive list of hypotheses, this unification does allow for the integration of more hypotheses in the future.

I begin in Section 2 by examining how these five literatures define and articulate theories of state crisis. In Section 3 I present a coarse-grained typology of state crisis which I use to draw together the theories from these five literatures. In Section 4 I present a unified theory of crises that occur in conditions of ecological-economic sufficiency, and in Section 5 a unified theory of crises that occur in conditions of worsening scarcity. I end with Section 6 in which I set out the three main contributions of this framework for state crisis research. First, that crises which occur in conditions of sufficiency are fundamentally different from crises which occur in conditions of worsening scarcity, and that these differences have thus given rise to two distinct bodies of theory. Second, that many systemic theories of scarcity rest upon a common mechanism of diminishing returns, though differences remain regarding precisely which returns are diminishing and why. Third, that once the sufficiency/scarcity distinction is taken into account, the hypotheses drawn from across the five literatures do not contradict, and can thus be considered competing but compatible. Integrating these theories into a unified state crisis theory, as I do here, establishes a framework for the future testing of these hypotheses. The ultimate hope is that better understanding crises in past states may help us better navigate crises in the future.

2. Five literatures on state crisis

For theories to be unifiable, or even comparable, it is important to first establish that they all advance explanations for broadly the same phenomenon: state crisis. A few theorists within the five literatures I examine do offer explicit definitions of 'the state' or of 'state crisis', though most more implicitly establish their objects of study through discussion and examples. In this section, I extract a few of the clearest statements I have found.

For clarity, 'the state' should be contrasted with 'the government', the latter denoting the particular group or coalition of groups with authority over the coercive apparatus of the state (see Van Bavel under review: §3). The word 'government' has its origins in the Greek verb meaning 'to steer' and is used in this way as early as Plato's metaphor of the Ship of State that is steered by those who govern it (*The Republic*, Book VI). Government crises seem to happen almost continuously, with frequent changes in personnel and policy whenever the limits to individual competence or collective compromise are reached. In comparison, the state itself tends to be more enduring and state crises relatively rare. As a heuristic, popular calls to change policies or personnel can be considered part and

parcel of the normal crises of government. In comparison, serious challenges to the legitimacy of the process by which governments are selected tend to indicate a crisis of the state itself. The potential for violence is also a strong indicator of a state crisis: since the state serves to mediate conflict, crises about the legitimacy of the state itself have no higher mechanism by which to be resolved, and thus are often accompanied by a higher risk of violence.

2.1 Definitions of 'state crisis'

Among neo-institutionalists (NIN), Jessop (2015) defines 'the state' as a territory organised under a political apparatus that has powers of coercion over a particular population. Jessop notes three aspects of state crisis that follow from his definition. First, state crises manifest themselves territorially through insecure borders and occupation. Second, state crises manifest themselves in the loss of capacity or legitimacy of the political apparatus. Third, state crises manifest themselves in the population as emigration and demographic decline. Jessop describes 'normal crises' as the kind that institutions such as the state are set up to manage. He contrast these 'normal crises' with state crises that occur when the very institutions of crisis management are unable to go on as they have before. These deeper systemic crises "occur when a set of social relations (including their ties to the natural world) cannot be reproduced ('go on') in the old way". He lists instances of state failure, corresponding to what I call state breakdown, that include genocide and civil war. Other institutionalists offer compatible descriptions. North et al (2009: 1, 268-270) deliberately do not offer an explicit definition or theory of the state, but describe crises in 'natural states' due to shocks that require renegotiation amongst elites; if these renegotiations fail then "violence is likely, including civil war... ethnic violence... or coups" (p. 21). Van Bavel (2016: 270) identifies a phase of crisis and decline also in more modern market economies, evidenced by increasing "state repression, armed violence, and warfare by states".

Socio-ecological systems (SES) researchers also repeatedly emphasise that their object of research is the state, typically focusing on whether or not state crises result in state collapse. Renfrew (1984: 367-8) defines collapse as "1) The collapse of central administrative organization of the state, 2) the disappearance of the traditional elite class, 3) the collapse of centralized economy, and 4) settlement shift and population decline". Yoffee (1988: 15) and Cowgill (1988: 256) similarly emphasise that it is the political apparatus of the state, rather than the society or civilisation more generally, that collapses. Much like Jessop, Tainter (1988: 26-28) explicitly defines the state in terms of a territorially organised ruling authority that claims a monopoly of force over a population. Tainter argues that crises that would be easily controllable by states with sufficient resources can prove insurmountable for states that lack such reserves (p.55). Tainter contrasts loss of power to competitors states with wider collapses where there "is no competitor strong enough to fill the political vacuum of disintegration" (p.202). Though crises can lead to war, invasion, decline, and collapse, crises may also prompt reform through "sweeping economic and political changes" to ensure "the survival of the State" (p.141). More recent works continue to endorse these definitions, often explicitly (Faulseit 2016: 5; Middleton 2017: 12). Collapse involves "[s]tate fragmentation" (Butzer 2012: 3636), "wars... population migration... mercenary military forces... rebellions... the widespread dissolution of polities... [so that it is] impossible to re-establish a central authority" (Drake 2012: 1863), and "state-level institutional infrastructure weaken[ing] so irrevocably that it ceases to exist" (Storey and Storey 2017: 17).

Demographic-structural theory (DST) "seeks to explain a particularly severe kind of state crisis... *state breakdown*" (Goldstone 2016 [1991]: 10). Examining the General Crisis of the seventeenth century, Goldstone notes that state crises arise when the state starts to become perceived as ineffective or unjust (p.9). He notes that various outcomes are possible: "[a] state crisis may be resolved peacefully if elites shore up state power, or if reformers succeed in rectifying state injustices. Or a state crisis may be resolved with a coup d'etat... a state crisis may lead to elite revolts and sharp intra-elite conflicts. And if popular unrest is waiting in the wings, conflict between the state and elites may

open the doors to popular uprisings or to mobilization of the population to support competing factions. Struggles for power among different groups may then lead to civil war" (p.10).

World-systems approaches (WSA) focus on the rise and decline of hegemonic states within a larger economic system. Wallerstein (1974a: 37) outlines the crisis of the feudal state in fourteenth and fifteenth century western Europe, in which "contraction following the expansion caused a 'crisis', one which was visible not only in the economic sphere but in the political sphere as well (internecine wars among the nobility and peasant revolts being the two main symptoms)". Wallerstein also examines the General Crisis of the seventeenth century and the resulting consolidation of power by a succession of individual core states (1974b: 407), and attributes state crises in the twentieth century to "a serious decline in the legitimacy of state structures" which "no doubt increase the amount of day-by-day violence in the world-system" (2000: 249, 264). Other world-systems analyses build similar analyses of conflict accompanying crisis and loss of hegemony in the core states (e.g. Gill 1993: 126-132; Amin 2010; Chase-Dunn et al. 2010: 64, 72; Modelski 2012: 67, 72-73; Modelski and Thompson 1996: 51-8; Denmark 2021: 39). Like Jessop, Chew (2007: 4-5) emphasises that crises are moments where existing natural and societal relations struggle to go on in the same way, and that these "crises are moments when system reproduction experiences obstacles and difficulties". Like Tainter, both Chew (2007: 6) and Chase-Dunn et al. (2010: 66) distinguish changes in the relative fortunes of competitor states from more widespread crises in the world-system itself. These wider world-system crises tend to lead to longer declines and even collapse, and are strongly associated with ecological exhaustion.

Peace and conflict research (PCR) examines crises in modern states. King and Zheng (2001) define state failure as "the collapse of the authority of the central government to impose order, as in civil wars, revolutionary wars, genocides, politicides, and adverse or disruptive regime transitions", a definition that corresponds to the description of state breakdown in the literatures outlined above. Building on Goldstone's earlier demographic-structural work (2016 [1991]), Goldstone et al. (2010: 190-2) examine "political instability" in states from 1955 to 2003, particularly those that end in "civil wars... democratic reversals, genocides, and state collapse...". Distinct from state breakdown, they also note that "[p]eaceful transitions to democracy" and "the peacefully negotiated dissolution of a federal union" are also possible. Margolis (2012: 15-16) similarly describes state crisis in terms of state instability, focusing on the questions of whether "the crisis move[s] toward repression, coup, civil war, or something else", and on whether "the state can reform".

2.2. Theorists of state crisis that refer across literatures

A few theorists do themselves refer to other literatures (see Fig. 1). Particularly noteworthy is that theorists from all five literatures engage with Goldstone's demographic-structural theory. This strongly suggests that they themselves consider themselves as sharing Goldstone's object of study: state crisis.

Fig. 1. Theorists from one literature that cite those from another: For details of who says what about whom, see main text

| | | literatures cited | | | | |
|----------|-----|-------------------|-----|-----|-----|-----|
| | | NIN | SES | DST | WSA | PCR |
| cited in | NIN | X | | X | X | |
| | SES | | X | X | | |
| | DST | | | X | X | |
| | WSA | | X | X | X | |
| | PCR | X | | X | | X |

Among new institutionalists, Van Bavel (2016: 275) finds similarities between his own account and Goldstone's (2002), writing that "[p]arts of the cycle as reconstructed here can also be found in the

work by Jack Goldstone... The economies he discusses, including the early modern Netherlands, each experienced a pulsation of economic growth and growing complexity, often later characterized as a 'golden age', but then declined again, in his view as a result of population pressure, social unrest, and crisis". Van Bavel notes even closer similarities with world-system analysis, writing that "[m]ost akin to the present book, however, is perhaps Giovanni Arrighi's investigation of how capital accumulation, financial markets, public debts, and state formation interact... [but] Arrighi only deals with one phase in this cycle—a final phase". Acemoğlu and Robinson (2012: 274) also very briefly note some similarities between their own work and world-system analysis in explaining differences in economic conditions in different countries, writing that "[t]he notion that the development of the rich countries of the West is the mirror image of the underdevelopment of the rest of the world was originally developed by Wallerstein (1974–2011), though he emphasizes very different mechanisms than we do".

Among social-ecological systems theorists, Holling (2001: 399) approvingly writes that Goldstone "hypothesized that political breakdown occurs when there are simultaneous crises at several different organizational levels in society. In other words, adaptive cycles at different levels in a panarchy become aligned at the same phase of vulnerability". Fischer-Kowalski et al (2019: 75) explicitly draw on Goldstone's (2001) classifications of revolution and revolt, but lament that Goldstone does not refer "to coal, or more generally energy, as a critical resource".

Among demographic-structural theorists, Goldstone (2016 [1991]: 2, 13, 16-7, 19, 42, 69-70, 77-84, 87, 117, 121, 146, 157, 360) frequently cites world-system analyst Wallerstein's explanation of the general crisis of the seventeenth century, though largely to note what Goldstone sees as limitations in Wallerstein's account. More recently, both Grinin and Korotayev (e.g. 2014) engage positively with both the demographic-structuralist and the world-system analysis literatures.

Among world-system analysts, Gill (1993: 130-2) notes that "Goldstone (1991) has recently argued that cycles of social rebellion... are essentially demographically driven... But there does seem to be a general historical correlation between concentration of accumulation and social rebellion... and also to possible disintegration, war, invasion, or collapse". Arrighi (2010 [1994]: 43) also proposes an alternative to Goldstone's theory, writing that "[i]t is plausible to suppose that this disruption and diversion of trade flows contributed far more decisively than demographic and climatic factors to the sudden worsening problem of vagrancy and to the 'subsistence crisis' which constitute the social and economic backdrop of the general crisis of legitimacy of the seventeenth century (cf. ...Goldstone 1991)". In contrast, Chase-Dunn and Hall (1997: 114) build on the work of Turchin (2003) and consider that "Goldstone's demographic analysis of revolutions fits nicely with our explanation of world-system evolution. Indeed, his explanation can be interpreted as a special case of the same processes analyzed in closer detail". Chase-Dunn and Hall (1997: 112-3, see also 115) also approvingly cite socio-ecological systems theorist Tainter, writing that "in periods of contraction, and especially when contraction is rapid and deep – the phenomenon of collapse investigated by Tainter (1988) – the still-present demographic, ecological, and circumscription factors reemerge". Tainter is also briefly cited by Chew (2007: 165).

Among peace and conflict researchers, the main connection is that Goldstone's (1991) earlier demographic-structural work inspires his later peace and conflict analyses. Goldstone et al (2010: 201) also very briefly refer to the new institutionalist theories of Acemoğlu et al (2006). But otherwise relatively little connection is made with the other literatures, despite sharing a broad conception of the state and of state crisis as well as a number of specific case studies. This is perhaps because peace and conflict researchers tend to focus on data analysis and so on more recent crises for which there is more data, rather than the longer timescales and more historical cases analysed in other literatures. This focus on violent crises in modern times also tends towards an emphasis on more peripheral developing states, rather than on the core states often examined by other literatures. Nevertheless, several of the cases analysed by peace and conflict researchers are also mentioned by researchers from other literatures (see next subsection).

2.3. Cases of state crisis common to different literatures

At least forty state crises are mentioned in two or more literatures (see Table 1). That these state crises are mentioned by researchers across different literatures, as cases to which their hypotheses might apply, further supports the idea that these researchers believe themselves to share a common object of study.

Table 1. Specific state crises discussed in two or more different literatures. I often name the crisis after its outcome, such as the subsequent civil war; contriving to name the preceding crisis itself, though technically correct, would be cumbersome and usually less informative. I here list only those which receive a particular mention in the texts. Additionally, data about several hundred additional state crises, many of them shared across literatures, are analysed by new institutionalist (Cox et al 2019), social-ecological systems (Fisher-Kowalski et al. 2019), demographic-structural (Korotayev et al 2011: 279-82), and peace and conflict researchers (Goldstone et al 2010).

| State crisis | Literature |
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| Tunisia 2010-2011 (Arab Spring; also including more general mentions of the Arab Spring in Libya, Syria, and Yemen, not listed separately in this table) | NIN: Acemoğlu and Robinson 2012: 1-7. SES: Fischer-Kowalski et al 2019: 75. DST: Grinin and Korotayev 2019. DST: Goldstone 2016: xxxii, 475-7. DST: Ortmans et al 2017: 62ff. PCR: Margolis 2012. PCR: Hillesund 2021. |
| Egypt 2011-2013 (Arab Spring) | NIN: Acemoğlu and Robinson 2012: 1-7. DST: Grinin and Korotayev 2019. DST: Goldstone 2016" xxxii, 475-7. DST: Ortmans et al 2017: 62ff. PCR: Margolis 2012. PCR: Hillesund 2021. |
| US c. 2008- | NIN: Van Bavel 2016: 243-245. NIN: Jessop 2015. NIN: Thelen and Conran 2016. DST: Turchin 2016. DST: Ortmans et al 2017. DST: Goldstone 2016: 480ff. |
| Europe c. 2008- | NIN: Van Bavel 2016: 245-250 (specifically northwestern Europe). NIN: Jessop 2015. NIN: Thelen and Conran 2016. DST: Ortmans et al 2017 (specifically UK). WSA: Amin 2013: 96-100. |
| Republic of Congo 1997-1999 (civil war) | NIN: Acemoğlu and Robinson 2012: 344. PCR: Goldstone et al 2010: 191-2. |
| Democratic Republic of the Congo 1996-2003 (civil wars, Mobutu Sese Seko ousted 1997) | NIN: Acemoğlu and Robinson 2012: 344. DST: Goldstone 2016: xxxii. PCR: Goldstone et al 2010: 191-2. |
| Somalia and Somaliland 1991-present (civil war) | NIN: Acemoğlu and Robinson 2012 (p.344) DST: Goldstone 2016: xxxii. PCR: Goldstone et al 2010: 191-2. |
| Yugoslavia 1991-2001 (Yugoslav or Balkan wars; Bulldozer Revolution to oust Milosevic in 2000) | NIN: North et al 2009: 21. DST: Goldstone 2016: xxxii. PCR: Goldstone et al 2010: 191-2. |
| Rwanda 1990-1994 (civil war and genocide) | NIN: Acemoğlu and Robinson 2012: 344. NIN: North et al 2009: 21. DST: Goldstone 2016: xxxii. |
| Liberia 1989-2003 (civil war) | NIN: Acemoğlu and Robinson 2012: 344, 373. DST: Korotayev et al. 2011: 279-82. |
| USSR 1989-1990 (collapse of communism) | NIN: Acemoğlu and Robinson 2012: 119-121. DST: Goldstone 2016 [1991]: 492. |
| Haiti 1984-1986 (protests oust Jean-Claude Duvalier) | NIN: Acemoğlu and Robinson 2012: 373. SES: Fischer-Kowalski et al 2019: SI:19, Table S3. |
| Iran 1979 (Iranian Revolution) | DST: Korotayev et al. 2011: 279-82. |

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| | <p>DST: Goldstone 2016 [1991]: 447-8, 475. PCR: Goldstone et al 2010: 191-2.</p> |
| Angola 1975-2002 (civil war) | <p>NIN: Acemoğlu and Robinson 2012: p.344. SES: Fischer-Kowalski et al 2019: 72 and SI:19, Table S3.</p> |
| Mozambique 1975 and 1977-1992 (war of independence then civil war) | <p>NIN: Acemoğlu and Robinson 2012: 344. SES: Fischer-Kowalski et al 2019: SI:19, Table S3.</p> |
| Bangladesh 1971 (war of independence and genocide) | <p>NIN: North et al 2009: 21. SES: Fischer-Kowalski et al 2019: 72, SI:13, Fig. S3, SI:19 Table. S3. PCR: Goldstone et al 2010: 191-2.</p> |
| Nigeria 1967-1970 (civil war or Biafran War) | <p>NIN: North et al 2009: 21. SES: Fischer-Kowalski et al 2019: 72 and SI:13, Fig. S3.</p> |
| Guatemala 1944 (protests oust General Ubico in June, October Revolution ousts junta) | <p>NIN: Acemoğlu and Robinson 2012: 349-350. SES: Fischer-Kowalski et al 2019: SI:19, Table S3.</p> |
| China 1911 (Xinhai Revolution) | <p>SES: Fischer-Kowalski et al 2019: 74; SI:18, Table S2. DST: Korotayev et al. 2011: 277-9. WSA: Amin 1990.</p> |
| Japan 1868 (Tokugawa Crisis and Meiji Restoration) | <p>NIN: Acemoğlu and Robinson 2012: 294-298. SES: Fischer-Kowalski et al 2019: 74. DST: Goldstone 2016 [1991]: 402-415. WSA: Amin 1990.</p> |
| USA 1861-1865 (American Civil War) | <p>SES: Fischer-Kowalski et al 2019: 74. DST: Turchin 2016: Chapter 7.</p> |
| Austria / Habsburg Empire 1848 (March Revolution, continues into May, August, September) | <p>SES: Fischer-Kowalski et al 2019: SI:18, Table S2. DST: Goldstone 2016 [1991]: 475.</p> |
| Germany 1848 (March Revolution) | <p>SES: Fischer-Kowalski et al 2019: SI:18, Table S2. DST: Goldstone 2016 [1991]: 475.</p> |
| France 1789 (French Revolution) | <p>SES: Fischer-Kowalski et al 2019: 74, SI:18, Table S2. DST: Goldstone 2016 [1991]: 475.</p> |
| England 1688 (Glorious Revolution) | <p>NIN: North et al. 2009: 72, 78, 183-187. NIN: Acemoğlu and Robinson 2012: 102-13, 122, 185-197. NIN: Van Bavel 2016: 211-214, 253-4. DST: Goldstone 2016 [1991]: 318-324. SES: Fischer-Kowalski et al 2019: 74, SI:18, Table S2.</p> |
| England 1642-1651 (civil war) | <p>NIN: Van Bavel 2016: 213 (also Cromwell's defeat of Levellers in 1647 and 1649). NIN: North et al. 2009: 183, 243. DST: Goldstone 2016 [1991]: 63-169. SES: Fischer-Kowalski et al 2019: 74, SI:18, Table S2.</p> |
| China 1618-1683 (Manchu conquest, Ming-Qing transition) | <p>NIN: Acemoğlu and Robinson 2012: 231-4, 300-1. SES: Root 2020: 99-101. SES: Tainter 1988: 56. DST: Goldstone 2016 [1991]: 349-315. DST: Turchin and Nefedov 2009: 311.</p> |
| Low Countries 1550s-1560s (start of stagnation and decline in welfare; food crises 1550s-1560s; start of Eighty Years' War 1568-1648) | <p>NIN: Van Bavel 2016: 196-7, 200-207. SES: Fischer-Kowalski et al 2019: 74, SI:18, Table S2. DST: Goldstone 2002. WSA: Arrighi 2010: 132-135, 138, 142-4.</p> |
| Northern Italy 1420s-30s (Florence-Lucca war 1429-33; democratic reversal in Florence 1434; Genoa crisis) | <p>NIN: Van Bavel 2016: 132. WSA: Arrighi 2010 [1994]: 105, also 220. WSA: Modelski 2012: 68.</p> |
| Europe 14 th -15 th centuries (Crisis of the Late Middle Ages) | <p>DST: Goldstone 2016 [1991]: 353. DST: Turchin and Nefedov 2009 (especially in France, and War of the Roses in England). WSA: Wallerstein 1974a: 37.</p> |
| China 1368 (Ming rebellion, Yuan-Ming transition) | <p>SES: Root 2020: 101, 109, 160. DST: Goldstone 2016 [1991]: 353. DST: Turchin and Nefedov 2009: 311. WSA: Abu Lughod 1993: 284.</p> |
| Northern Italy 1360s-70s (rebellions in Lucca in 1369, Perugia in 1370-5, Siena in 1371, and Florence in 1378). | <p>NIN: Van Bavel 2016: 130. WSA: Arrighi 2010: 103.</p> |
| China 1271-1279 (Song decline, Song-Yuan transition) | <p>NIN: Van Bavel 2016: 33, 35.</p> |

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| | <p>WSA: Modelski and Thompson 1996. DST: Turchin and Nefedov 2009: 311.</p> |
| Byzantium 977-1071 (civil wars, decline) | <p>SES: Tainter 1988: 70, 86, 203. WSA: Gills and Frank 1993b: 174.</p> |
| Iraq 10 th century (start of crisis and decline) | <p>NIN: Van Bavel 2016: 78-94. WSA: Abu-Lughod 1989: 192. WSA: Gills and Frank 1993b: 176. SES: Butzer 2012: 3635.</p> |
| Lowland Classic Maya c.810- (collapse) | <p>NIN: Acemoğlu and Robinson 2012: 147. SES: Tainter 1988: 152-177 and passim.</p> |
| Byzantium 6 th century (crisis and decline) | <p>DST: Baker 2011. WSA: Chew 2007: 156.</p> |
| Roman Empire 235-284 (Crisis of the Third Century or Imperial Crisis) | <p>NIN: Acemoğlu and Robinson 2012: 158, 172-175. NIN: Van Bavel 2016: 32, 35. SES: Tainter 1988: 128-151 and passim. DST: Turchin and Nefedov 2009: 233-239. WSA: Chew 2007: 112, 139-165 and passim. WSA: Gills and Frank 1993a: 91.</p> |
| China 180-220 (Han crisis and decline) | <p>NIN: Van Bavel 2016: 33. DST: Turchin and Nefedov 2009: 311. WSA: Gills and Frank 1993a: 91.</p> |
| Rome 133 BC (the Gracchan Crisis of the Roman Republic) | <p>NIN: Acemoğlu and Robinson 2012: 158-172 . SES: Tainter 1988: 69, 77, 129, 150, 202, 214. DST: Turchin and Nefedov 2009: 201-207.</p> |

In summary: across these five literatures, there is a shared focus on the state, broadly defined as a political apparatus with coercive power over a population within some territory. Across literatures, a state crisis is a decisive turning point where it is possible that the state might not continue in its current form. Across literatures, crises may result in violent breakdown or collapse as well as entrenchment or reform. Across literatures, there is an overlap in cases of state crisis that theorists seek to explain. Essentially, what unites these literatures is the motivation to better understand why state crises occur, and why some state crises result in collapse, some in breakdown, others in entrenchment, and still others in reform.

3. My typology of state crisis

In this section, I set out a coarse-grained typology of crisis (see Fig. 2). I organise my typology in terms of the ecological-economic and institutional factors hypothesised to influence the likelihood of crisis and to influence the kinds of societal response that crises provoke.

3.1. My typology

I begin by making a fundamental distinction between two broad kinds of crises: those that occur in conditions of ecological-economic sufficiency, and those that occur in conditions of worsening scarcity. This is an important distinction rarely emphasised in the literature (though see Korotayev et al. 2011: 277-279; also Section 4 below). I emphasise this otherwise relatively neglected distinction because a different set of theories is proposed to explain 'sufficiency crises' than to explain 'scarcity crises' (see Sections 4 and 5 below).

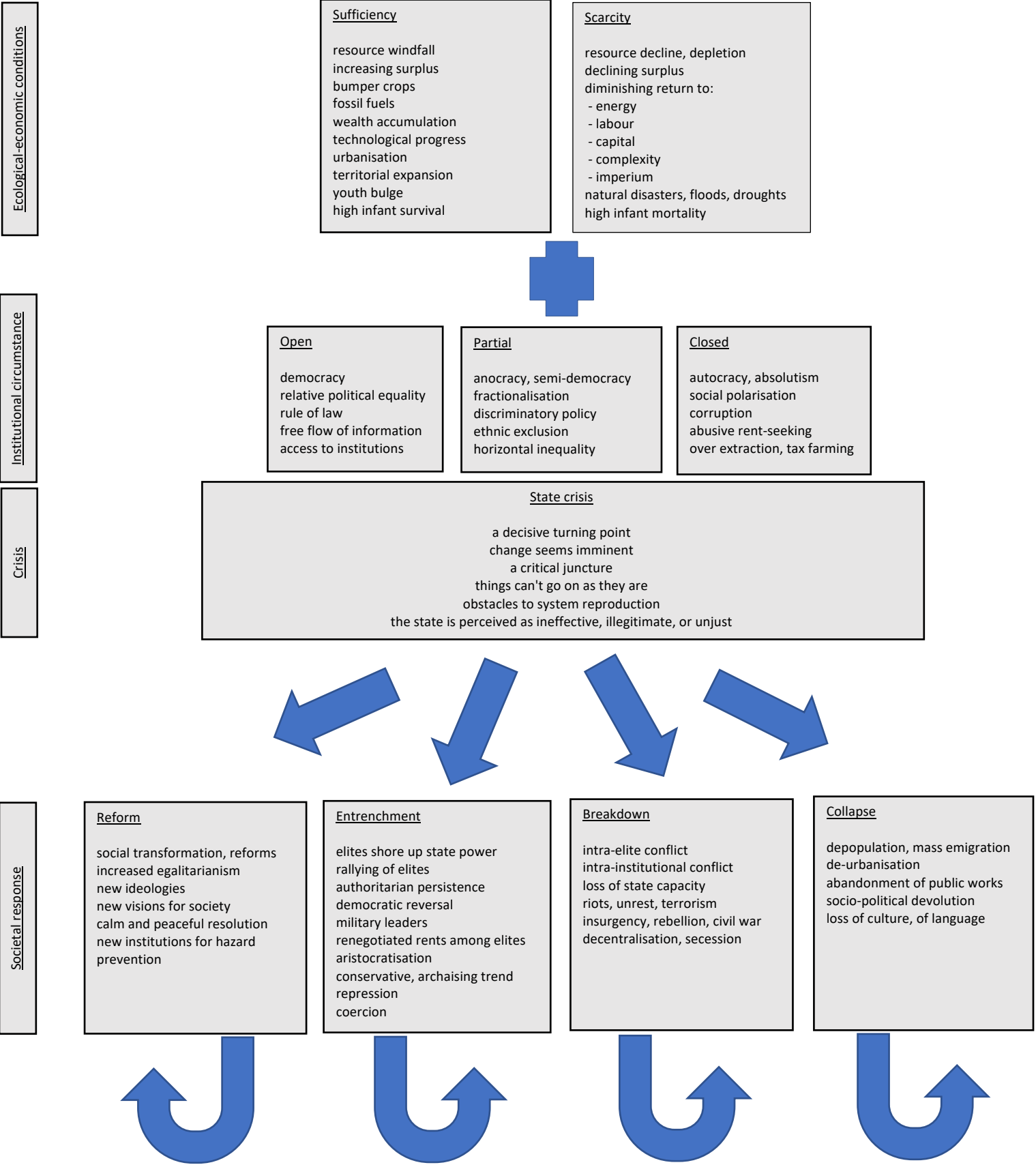
Institutional factors are also theorised to play a role in the genesis and evolution of crises. A distinction is often made between states that are 'open' democracies and those that are 'closed' autocratic states (North et al. 2009; Acemoğlu and Robinson 2012). I add an intermediate third category of 'partial' states, reflecting the recent consensus among peace and conflict researchers that this third category is crucial in explaining the incidence and severity of crises in modern states (King and Zheng 2001; Stewart 2005; Bodea and Elbdawi 2007; Goldstone et al 2010; Cederman et al 2013;

Hillesund 2019, 2021). I use the word 'partial' to mean 'partially open and partially closed'; the word also has connotations of the bias and discrimination typical of these partial states.

Finally, I distinguish a range of four societal responses to crisis. 'Reform' is where crises are resolved through relatively peaceful social or political change. 'Entrenchment' is where elites shore up state power and resist change. 'Breakdown' is where conflict becomes protracted, violent, and divisive. 'Collapse' is where there is extensive depopulation, socio-political devolution, and loss of culture. These four outcomes are often presented in the various literatures in terms of binaries, with research questions often framed in terms of whether or not there is reform, whether or not there is entrenchment, whether or not there is breakdown, and whether or not there is collapse. These binaries thus tend to bundle together outcomes that are seen as distinct in other literatures. For example, entrenchment is sometimes characterised as a successful societal response for reconstituting the state, particularly in more ancient historical examples (e.g. Butzer 2012; Schwartz and Nichols 2006) whilst among researchers examining more modern societies, entrenchment is often seen as a form of institutional backsliding more akin to state breakdown (e.g. Goldstone et al 2010; Van Bavel 2016). The four categories of societal responses I outline here could, of course, be unbundled further, and for many questions further sub-division could be important (e.g. Margolis 2012: 17; Hillesund 2021). But for the purposes of my coarse-grained typology, these four headings represent the minimum number of categories needed to capture the range of societal response posited by theorists across these five literatures.

State crisis theory: A unification

Fig. 2. A typology of state crisis: Organised in terms of a combination of two ecological-economic conditions and three institutional circumstances within which state crisis occurs, and four societal responses to that crisis; societal responses may themselves be factors that feedback into subsequent ecological-economic conditions and institutional circumstances. Each term is illustrated with some of the words and phrases associated with those categories from across the five literatures.



This typology captures the key factors put forward in the literatures I examined. In essence, it captures the idea that a variety of ecological-economic and institutional factors can contribute to crisis, and influence the societal response to those crises. Across literatures it is commonly suggested that no single ecological-economic or institutional factor suffices to explain crisis, and my typology here thus captures that many different specific factors may play a role. The typology remains sufficiently coarse-grained and general to encompass the quite broad range of crises and cases examined across the five literatures. But it is also sufficiently fine-grained to help organise this diverse field in terms of the questions that are of most interest to researchers. These questions we might now phrase with more precision: Which ecological-economic conditions and which institutional circumstances increase the likelihood of societal crisis? And which of these factors influence the different societal responses that result?

The eventual testing of these competing theories will require clearly defining the variables that the different theories hypothesise to be related. My framework will thus help us to avoid conflating different variables that should really be analysed separately. For example, though it might sometimes be tempting to use population size as a proxy measure for social complexity, doing so makes it impossible to differentiate hypotheses specifically about complexity from hypotheses specifically about demographic change. My framework makes it clear that alternative proxies must be found if these different hypotheses are to be tested. And if no alternative is available for a given case, then my framework makes it clear that insufficient data exists to properly test these theories against that case.

3.2. Comparison with existing typologies

I have found no typologies that attempt to integrate all these different factors and possible responses into a single unified framework. But within the five literatures I do find several partial typologies (sometimes called 'conceptual models' or 'pathways' or 'classificatory schemes') which I have drawn on when constructing my own. Their authors tend to use these typologies to set out hypothesised causal relationships, whereas I intend my typology to be theory neutral in the sense that in principle any combination of ecological-economic, institutional, and societal response is possible within it. But it is instructive to compare them, to see how my typology reflects the more partial typologies that I have integrated into my own.

Van Bavel (2019: 62, fig. S1.1.2; also Van Bavel et al. 2018) focuses on the effect of state capture on the institutions that govern environmental hazards. It links together how egalitarianism enhances the chances of governance institutions adjusting to circumstances, derived from a more specific analysis of the governance of high water hazards to prevent flood disasters. It describes how a buffering feedback loop can occur in which measures are taken to increase economic and political equality which in turn increases the information and motivation necessary to improve hazard management which helps to prevent disasters. But a cascading feedback loop can also arise when elites entrench and engage in 'state capture', increasing inequality and making management improvements less likely, thus increasing the risk of further disasters which in turn increase inequality, and so on. This is not strictly speaking a typology of state crisis. But it does express the idea that the societal response to adverse events can be influenced by institutional openness, and that entrenchment as well as reform are possible outcomes. These insights I have incorporated into my own typology.

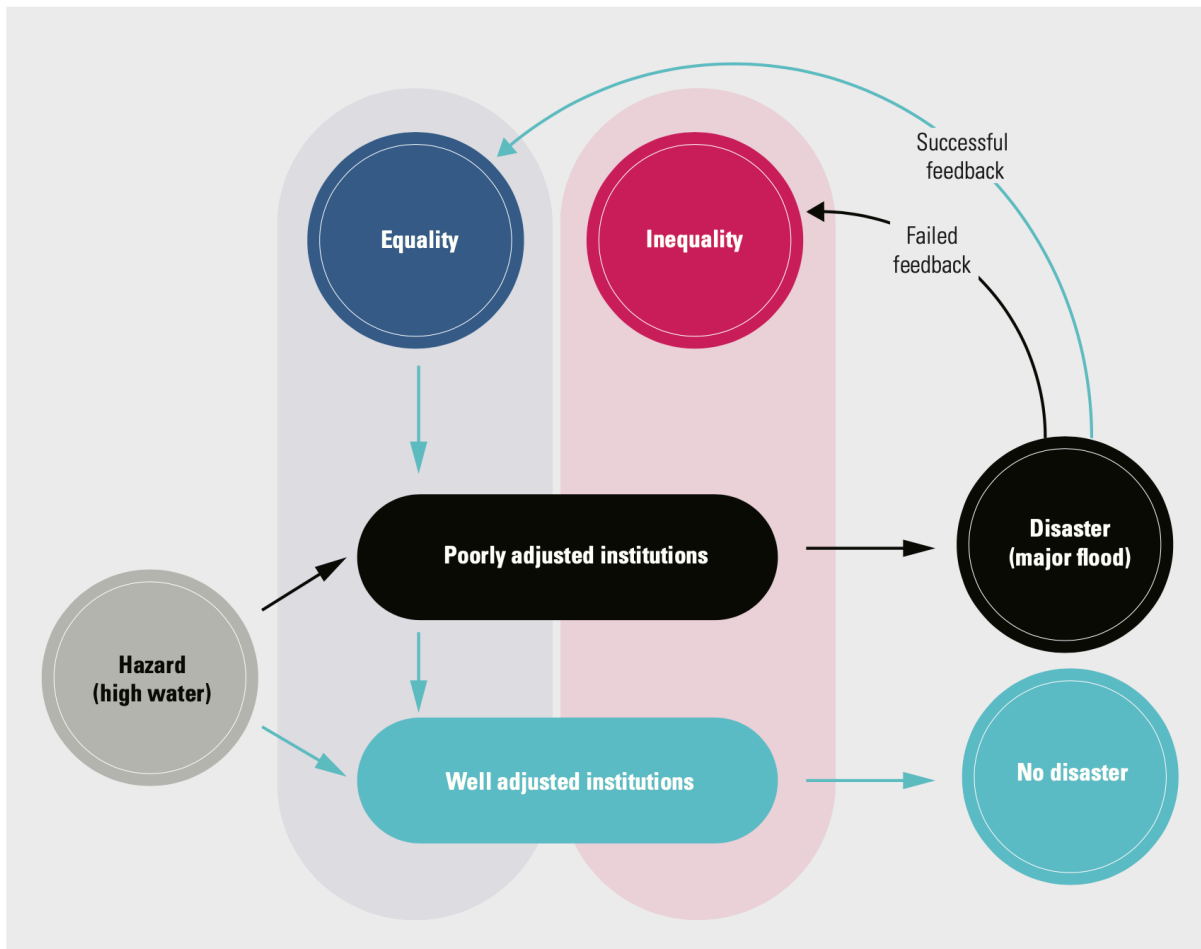


Fig. 3: Van Bavel's (2019) model linking the hazard of high water to flood disasters focuses on how institutions of relative economic and political equality increase the chance that institutions will adjust and preventing future disasters.

Synthesising theories drawn from across the socio-ecological systems (SES) literature, Butzer (2012: 3636, fig. 1) presents a conceptual model for historical collapse and resilience. In societies with a high level of resilience, buffering feedbacks mean that elites are able to rally and reconstitute the state. But in societies with low resilience, cascading feedbacks lead to breakdown and then to collapse, including elite polarisation, urban decline, a fracture of social order, civil wars, and state fragmentation. This corresponds very closely to the scarcity crises of my typology, and I have drawn a great deal from its nuanced analysis. But unlike my typology, Butzer's conceptual model does not consider sufficiency crises. And it also does not really consider the possibility for reform: although social transformation and new ideologies are mentioned, these are in the context of elites rallying around authoritarian military leaders and mobilising support for elite entrenchment.

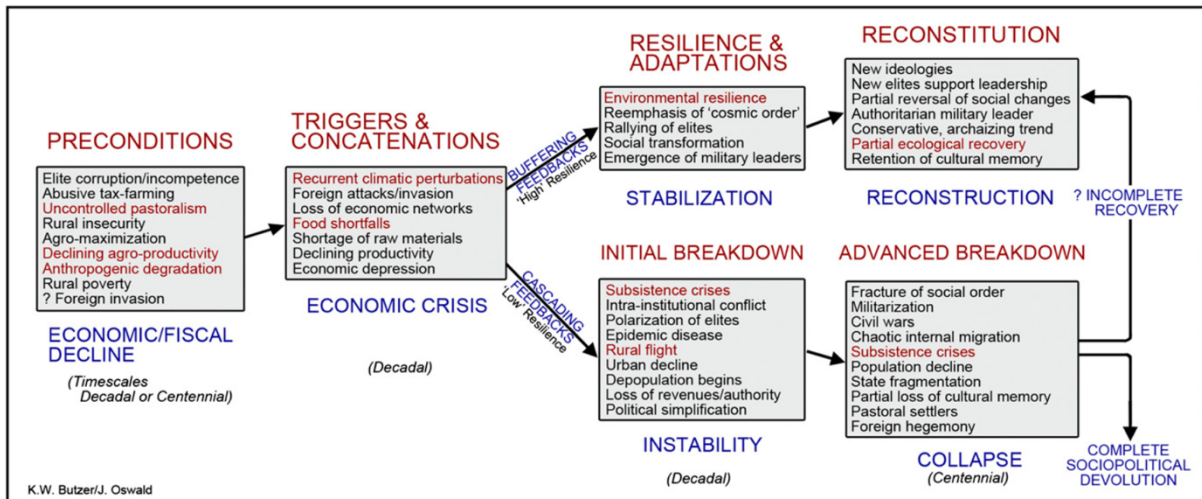


Fig. 4: Butzer's (2012) conceptual model for crises in historical societies which may stabilise and reconstitute, or may breakdown and collapse.

Within the world-system (WSA) literature, Chase-Dunn et al. (2010: 73. fig. 5, revised from Chase-Dunn and Hall 1997: p.102 fig. 6.1) draw on Turchin (2003) as well as on the work of anthropologists Marvin Harris, Robert Carneiro, and Allen Johnson and Timothy Earle. In their model, scarcity crises occur when population growth and intensification leads to environmental degradation, in turn leading to increased conflict; this downswing corresponds to conditions in which scarcity crises occur in my own typology. During the upsweeps in their model, conflict sets the stage for rapidly expansionist states and increasing urbanisation, trade, and technology; but they do not discuss the 'sufficiency crises' that may occur during this phase of the cycle. Their upswing ends when population growth once again leads to intensification and degradation, and thus once more to decline.

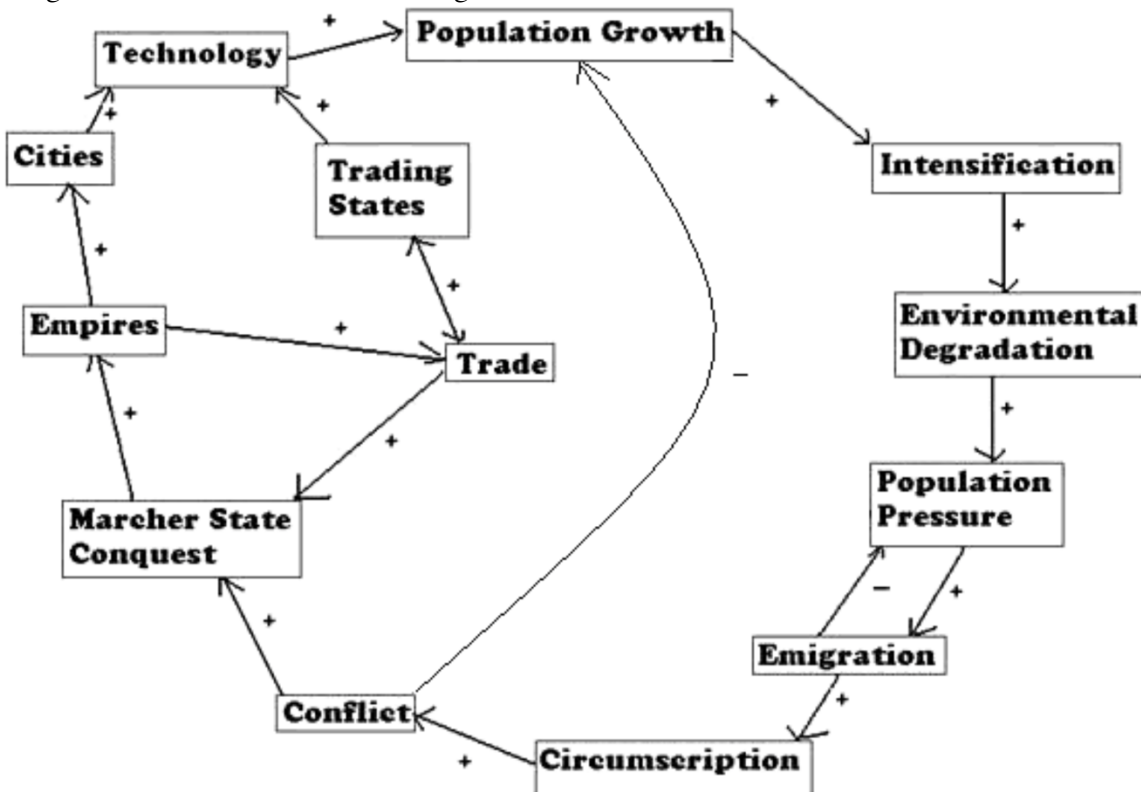


Fig. 5: Chase-Dunn et al. (2010) model population growth inducing the 'nasty right side' decline into environmental degradation and conflict, followed by upsweeps of cities, empires, technology, and trade on the left.

Among demographic-structural theories (DST) and its variants, Turchin and Nefedov (2009: 19-21) verbally set out a secular cycle with a disintegrative phase when the population tends to decline, elites are divided, the state is weak, and there is instability and disorder including civil war. This corresponds in my typology to scarcity crisis, particularly in partial and closed societies where elite division is often thought to influence whether the societal response to a crisis is entrenchment or breakdown. They also set out an integrative phase of the cycle which occurs in conditions of sufficiency when the population increases, elites are unified, and there is a strong and stable state (though often there are expansionary wars of conquest). Turchin and Nefedov do not much discuss sufficiency crises. But elsewhere both Goldstone (2016 in additions to his 1991) and Korotayev et al. (2011) emphasise that crises associated with 'youth bulges' occur in conditions of sufficiency; both also note that though they may inspire hope for reform, such crises actually often result in entrenchment or breakdown.

Within the peace and conflict research (PCR) literature, Vesco et al. (2020: 2, fig. 1) set out some main pathways connecting natural resources to conflict risk. Like my distinction between scarcity and sufficiency, Vesco et al. distinguish abundance from scarcity, noting that abundance can lead to higher opportunities for looting, corruption, and slow economic growth, whilst worsening scarcity can lead to loss of economic activity, food crisis, livelihood deterioration, and outmigration. Both can lead to political crisis, economic instability, and societal fragmentation by lowering the cost of fighting whilst increasing the motivation to fight. Thus both abundance and scarcity can increase the risk of conflict. As is usual with peace and conflict research, their focus is on violent breakdown rather than the possibility for reform, entrenchment, or collapse, as well as on partial or closed rather than more open societies. In terms of my typology, Vesco et al.'s pathways correspond to the way that both sufficiency and worsening scarcity can lead to breakdown, particularly under partial or closed institutional settings.

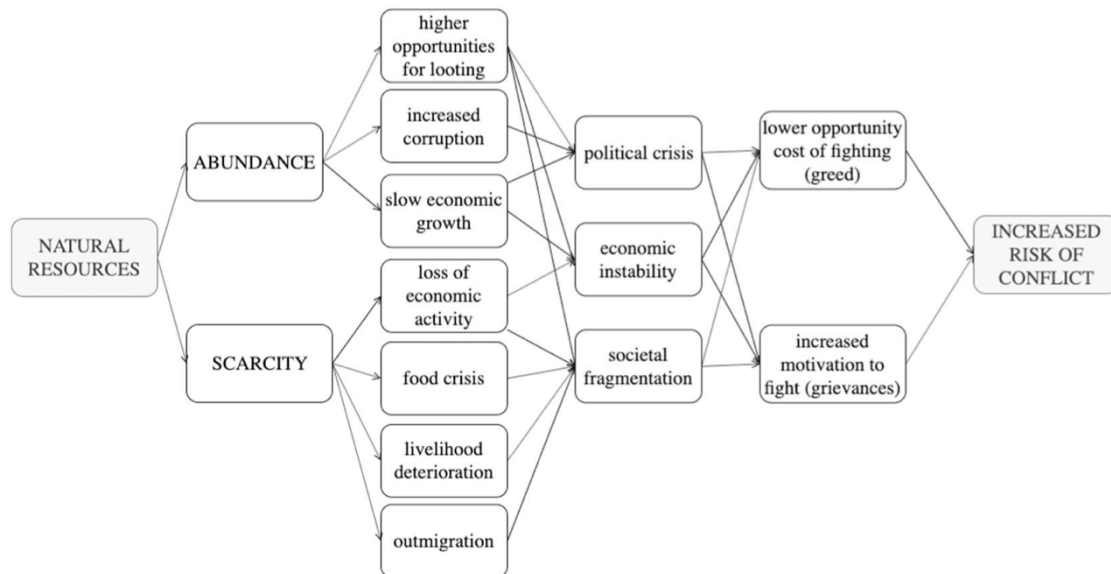


Fig. 6: Vesco et al.'s (2020) main pathways connecting both resource scarcity and resource abundance to conflict.

4. A unified theory of 'sufficiency crisis'

I begin my unification of theories by compiling the hypotheses relating to sufficiency crises. Across the five literatures, there are notably fewer theories about sufficiency crises than there are about scarcity crises.

4.1. Why sufficiency crises occur

Van Bavel (2016: 251-3) clearly distinguishes the "social revolts and upheavals" that occur in the context of "relatively high levels of wealth and welfare" and typically including "a massive extension of cultivated area and huge population growth, and... substantial technological progress", and contrasts these with the unrest that occurs during periods of worsening scarcity. He connects sufficiency crises to the undermining of old feudal elites and the stimulation of markets for land, labour and capital. North et al. (2009: 21) are less explicit in distinguishing different types of crisis but nevertheless note that, in 'natural' states with less open institutional conditions, even potentially beneficial changes such as "bumper crops... [and] technological change..." can destabilise states and make violence more likely. Relatedly, contemporary observers themselves sometimes focus on 'moral decay' in the form of declining standards, particularly in public life, that accompany state crises. The theory is that an increase in personal wealth produces individuals whose power exceeds the abilities of states to constrain them, with those individuals acting to close state institutions and thus increasing the potential for corruption, coercion, and violence (Van Bavel 2016: 141-2; Ungern-Sternberg 1998).

Fischer-Kowalski et al. (2019: 69-71) analyse the transition from agrarian to fossil fuel based energy systems and its relationship with social revolution. They emphasise the key role of "cheap combustion material" in allowing a large mass of people to live in close proximity, who are then "able to organise themselves, and to develop new visions for society". People migrating to fast growing urban centres are no longer constrained by serfdom and slavery, and are instead hired as wage labourers. The goods they make yield a surplus to manufacturers and traders, who reinvest that surplus and gradually accumulate economic and political power. This challenges the power of the traditional land owning elites. The resulting tensions "may be resolved calmly and peacefully, or lead to social revolutions".

Korotayev et al. (2011) emphasise the demographic aspects of urban growth, examining the Arab Spring and uprisings in other countries in similar situations throughout the twentieth century. They find that unrest occurred despite that fact that "the quality of life for the majority of the population, as measured by such demographic indices as life expectancy, has been steadily improving" (p. 277). They explain that "[m]any researchers regard the rapid growth of the youth share in population as a major factor of political instability... [alongside] a rapid growth of urban population due to both natural increase and rural-urban migration... Thus, not only does the most radically inclined part of population explode numerically, it also becomes concentrated near the centers of [the] political system, presenting a serious danger for political stability". Korotayev et al. (2011: 277-279) explicitly contrast sufficiency crises with the kind of scarcity crises that presaged the breakdown of the Qing Dynasty in nineteenth century China and the breakdown of Ethiopia in the twentieth century.

In terms of my framework, then, these theories suggest a broad consensus about the kinds of factors that might provoke sufficiency crises. The hypothesised factors are: technological progress, an increased surplus, population growth, a youth bulge, the emergence of new elites, urbanisation, and the organisation of people around new ideas about how society should be organised (see Table 2).

Table 2. Why sufficiency crises occur

| |
|--|
| Hypothesised factor |
| Technological progress |
| Increased surplus |
| Population growth |
| Youth bulge |
| New elites (undermining of old elites) |
| Moral decay |
| Urbanisation |
| New organisations (fostered by urbanisation) |
| New ideas about society (fostered by urbanisation) |

4.2. What influences the societal response to 'sufficiency crises'

There are even fewer explicitly stated hypotheses with regard to the second question of concern to crisis theorists: why do some otherwise similar crises result in markedly different social responses? Van Bavel (2016: 252) notes that even successful revolts do not invariably lead to reform, and tentatively suggests that success in weakening old elites might also be conditional upon an already fairly developed economy, functioning systems of exchange and allocation, output markets and trade networks, and relatively high levels of wealth and welfare. Though Fischer-Kowalski et al. (2019) mention that tensions may be resolved calmly or lead to revolution, their aim is not to explain why crises go one way or the other, and they advance no hypotheses in this direction. Korotayev et al. (2011) similarly do not advance a hypothesis about this. They note (p.297) that many more were killed during protests by low-educated Egyptian youths in the 1977 'Bread Riots' than protests by high-educated youths during the 2011 Arab Spring, comparing the former to bloody civil wars and the latter to the youth uprisings of 1968 and the 'velvet revolutions' of the 1980s. But in Egypt, both the 1977 and 2011 uprisings resulted in entrenchment rather than significant reform.

Vesco et al. (2020: 3, 11) summarises a line of argument known as the "resource curse hypothesis" often posited both by institutionalists and by peace and conflict researchers, especially for partial or closed states. The theory is that resource abundance can lead to entrenchment as elites have an incentive to engage in extractive behaviours and thus "widespread corruption, lack of transparency, poor rule of law, and weak institutions", and can also increase the risks of state breakdown into conflict over those resources. This is thought especially likely in the presence of non-renewable but highly profitable resources such as minerals and fossil fuels (see also Blair et al. 2020). Vesco et al. (2020: 12) do not intend any detailed explanation of why some crises turn violent, but emphasise that "[f]urther attention needs to be devoted to the mechanisms and pathways connecting natural resource abundance/scarcity to conflict".

One hypothesis can also be derived from my typology of cases, though it tends to be advanced as a general argument rather than specifically as an explanation for sufficiency crises. This is the broad consensus among peace and conflict researchers that both open states and closed states are less likely to experience violent breakdown than partial states. The theory is that an open state is more likely see the enacting of timely reform in response to crisis, and a closed state more likely to see entrenchment and the enforcement of state authority. But in a partial state both reform and entrenchment are more difficult, and hence partial states are thought to be at greater risk of breakdown (King and Zheng 2001: 651; Goldstone et al. 2010). A variation on this theme is that violence is more likely where there are severe 'horizontal inequalities' between cultural groups (Stewart 2005), since the exclusion of ethnic, religious, or linguistic groups from political processes increases factionalisation and the risk of conflict (Bodea and Elbadawi 2007: 23-24; Cederman et al 2013: 4-5). Similarly, Hillesund (2021: 4-6) suggests that the political exclusion of a particular cultural group motivates dissent whilst their economic exclusion limits the effectiveness of nonviolent tactics, thus making violence more likely.

In summary, sufficiency crises are theorised as potentially leading to three of my societal responses: reform, entrenchment, or breakdown (see Table 3). Sufficiency crises are not generally supposed to lead to collapse. This is perhaps unsurprising: sufficiency crises occur precisely in conditions of population growth, improved or sustained quality of life, increased surpluses, and urbanisation, in contrast to the depopulation, widespread immiseration, declining surplus, and urban abandonment associated with state collapse.

Table 3. Factors influencing the societal response to sufficiency crises

| Hypothesised factor | Increased likelihood of |
|------------------------------------|-------------------------|
| Economic development | Reform |
| Relatively high wealth and welfare | Reform |
| Relative economic equality | Reform |
| Systems of exchange and allocation | Reform |
| Output and trade networks | Reform |
| Open institutions | Reform |

| | |
|--|--------------|
| Closed institutions | Entrenchment |
| Partial institutions | Breakdown |
| Horizontal inequalities | Breakdown |
| Factionalisation / elite fragmentation | Breakdown |

5. A unified theory of scarcity crisis

5.1 Why scarcity crises occur

The majority of the theories I have surveyed are theories of scarcity crisis. I present the hypotheses of these theories in two groups: shocks; and diminishing returns.

5.1.1 Why scarcity crises occur: shocks

Scarcity crises are often thought to be precipitated by some shock. These shocks are variously described as 'accidental' (Jessop 2015), 'adverse events' (Janssen et al. 2003: 727), 'accidental disruptions' (Middleton 2017: 27), 'agents of disturbance' (Holling 2001: 394-396), 'hazards' (Van Bavel 2019: 62), 'major stress surges', 'major adversities' (Tainter 1988: 195-6), and 'triggers' (Butzer 2012). These are often considered to be relatively short term events and contrasted to more incremental or systemic factors. But sometimes they are actually long term changes that take place over decades or centuries, though often some particular noteworthy event stands out from within the context of a longer term change.

Shocks include environmental changes such as droughts and other adverse weather events, including those that occur in the context of longer term climatic changes (Weiss 2017: 1-3; Holling 2001: 394). They also include tectonic shifts and volcanoes (Chew 2007: 4), earthquakes (Drake 2012: 1863), wind, fire, and insect outbreak (Holling 2001: 394-396). Disease is also often considered a shock (Goldstone 2016 [1996]; Holling 2001; Butzer 2012), with the increased risk and impact of epidemics themselves thought to be a consequences of increased trade and world-system expansion (Chase-Dunn and Hall 1997: 114). Whatever the cause, a drop in population is thought to be accompanied by a short term increase in the proportion of the population engaged in subsistence activities and hence a drop in trade, which in turn can lead to a loss of political, economic, and cultural hegemony (Abu Lughod 1991: 18-20), networks (Butzer 2012), and complexity (Diamond 2005: 3-6). Technological change is rarely thought to be the main driver of worsening scarcity, but one exception is the theory that the Late Bronze Age population collapse may have been caused by social destabilisation resulting from new iron technology making long established networks redundant (Armit et al. 2014: 17047; for hypotheses about the *lack* of technological change, see Subsection 5.1.2. below).

Warfare is also associated with destabilisation, disruption, and decline. In general, however, within my typology I tend to treat warfare as an aspect of breakdown, rather than an ecological-economic condition in its own right. So although warfare can constitute a cascading feedback that perpetuates or escalates an existing crisis, within my typology warfare is typically a consequence of crisis, rather than a cause. This is especially the case for intra-state violence such as civil war. But to an extent 'external' warfare, in the broad sense of warfare that originates far away and over which a state has little influence, might nevertheless be considered a shock. Certainly, external warfare can cause disturbances in some respects quite similar to those caused by environmental disasters or by pathogens, and with the same caveat that a state's interdependence with the wider system can increase both the risks and the impact of these disturbances. Even distant warfare can disrupt trade and other networks (Butzer 2012; Abu Lughod 1991: 18-20, 360). The effects of foreign attacks and invasions can range from disruptive to catastrophic, with colonisation in particular emphasised as a shock that can trigger full-blown demographic, political, and cultural collapse (Butzer 2012: 3638; Middleton 2017: 26-27).

Table 4. Why scarcity crises occur: shocks

| |
|---|
| Hypothesised factor |
| Tectonic events (earthquakes, plate shifts, volcanoes) |
| Wind, fire, insect outbreak |
| Drought, mega-drought, adverse weather, climatic change |
| Disease |
| Technological disruption to networks |
| External warfare disrupting networks |
| Foreign attack, invasion, colonisation |

5.1.2. Why scarcity crises occur: diminishing returns

It is common, particularly among neo-institutionalists, to distinguish 'shocks' from processes that are more 'endogenous' (Greif and Laitin 2004; Gerschewski 2021), 'inherent' or 'systemic' (Jessop 2015), and the result of 'internal tensions' (Thelen and Conran 2016: 20). But when compiling these diverse 'non-shock' factors of worsening scarcity, I was struck by how many of these hypotheses ultimately derive from a theory of diminishing returns. So I have subtitled this subsection 'diminishing returns', as a clear statement of what unites these theories, and of what distinguishes them from the 'shocks' I've just described.

In the abstract, a theory of diminishing returns (also called 'declining' or 'decreasing marginal' returns) posits that, all else equal, the return on inputs declines as more inputs are added. At a certain point, more investment of an input no longer provides any increase in return. All the theories here share this formal similarity, but differ about which inputs are subject to diminishing returns.

The diminishing returns argument is applied perhaps most fundamentally to the investment of resources in acquiring further resources. Diminishing returns occur since it is most efficient to first use resources that are easiest to acquire and, when those initial sources are exhausted, to shift to other sources that are harder to acquire. This shift results in reduced returns for the same investment (e.g. Tainter 1988: 92, 110, 125, 194-6). Often accounts focus on energy resources expressed in terms of energy return on energy invested, partly because all productive and reproductive processes require energy, making it a somewhat culturally independent measure of resource use than more specific agricultural goods or construction materials. But the same basic argument applies across natural resource acquisition, and also to the costs of disposing of waste in sinks: initially disposal costs are low, but over time the costs of disposing of waste and the negative effects of pollution grow ever faster (Moore 2015: 37, 269).

Tainter's influential account also emphasizes the role of social complexity in both using and acquiring energy (Tainter 1988; Chase-Dunn and Hall 1997: 112-5; Root 2020: 258-260; Cumming and Petersen 2017: 2; Middleton 2017: 11-12). Much of the investment in human societies is in the form of increasing the complexity of organisations to solve problems. But these organisations in turn require increasing amounts of energy for their maintenance. At the point where additional complexity costs more energy than it returns, societies are no longer able to solve their problems via more complexity. Complexity becomes a less attractive strategy, and some parts of society may make efforts to break away since secession and rebellion become more attractive. As productive capacity and accumulated surpluses decline, there are fewer reserves with which to deal with any shocks that occur. Tainter (1988: 195) writes that "[o]nce a complex society enters the stage of declining marginal returns, collapse becomes a mathematical likelihood". Collapse is sometimes described as an appropriate response to a situation, and though often appearing catastrophic for elites, may actually be beneficial for others within the population (Tainter 1988: 198).

Populations are themselves theorised to be subject to diminishing returns as their numbers grow. All else equal, population growth increases pressure on ecological resources, and diminishing returns to labour. Diamond (2005: 6) lists several ways in which intensification can lead to ecological

degradation, including "deforestation and habitat destruction, soil problems (erosion, salinization, and soil fertility losses), water management problems, overhunting, overfishing, effects of introduced species on native species, human population growth, and increased per-capita impact of people". As resources are used up or degrade, people must work just as hard to acquire fewer returns. This decline in per capita output increasingly immiserates the population; the point at which an increase in population produces negative returns is sometimes known as the 'carrying capacity', beyond which starvation or emigration brings the population back down (Cumming and Petersen 2017: 7; Motesharrai et al. 2016). Boserup importantly qualifies this by showing that population pressure can also prompt technological innovations that increase per capita output (Boserup 1965, 1981). Technological progress is thought to be more likely under more open institutions that are more conducive to innovation (Acemoglu and Robinson 2012: 119-121; Modelski 2012: 73). But both institutional and technological innovation are themselves hypothesised to be subject to diminishing returns (Motesharrai et al. 2016: 93).

Population growth is also theorised to initially benefit elites. But elites eventually exceed what the general population can support, thus making crisis more likely. This phenomenon is usefully termed 'elite overproduction' to distinguish the mechanism from population growth more generally (Turchin and Nefedov 2009: 313). An early version of this argument is that diminishing returns to labour drives up commodity and land prices, initially driving down wages. This increases the financial burdens on the state, but crucially also increases the elite numbers and elite levels of consumption, eventually leading to ever more economic and political competition between an increasing number of elites. This occurs alongside the continuing decline in wellbeing of the general population, whom competing elites try to recruit and mobilise against other elite factions (Goldstone 2016 [1991]). The particular focus on the behaviour and motivations of elites makes this a lagged second-order theory of diminishing returns, in which the number and appetites of elites initially increases but soon outpaces the carrying capacity of what can be extracted from the general population. This leads to increasing social polarisation, more coercive extraction, and elite infighting over a dwindling income base (Turchin and Nefedov 2009: 313; Motesharrai et al. 2016 construct a second-order model of these dynamics).

Some recent variations of demographic-structural theory de-emphasise the demographic elements of the account. In effect, they dispense with the 'diminishing returns to labour' part of the argument, that is, the first-order argument that wages decline as population pressure on resources increases. Turchin's structural-demographic account (2016) instead proposes that labour supply outpacing demand drives down wages, whilst Alexander's non-demographic account (2016, 2017, 2019) suggests that low wages are more to do with changes in institutional culture and policies to suppress wages. In other words, in these more recent variations the 'first-order' dynamics of declining wages are not necessarily driven by diminishing returns to population growth – but the 'second-order' part of the argument, whereby elites experience diminishing returns, is nevertheless retained. Initially, low wages allows elites to increase, but eventually elite numbers and their expanding consumption exceeds what the general population can sustain. Elite investment, whether into production or into coercion, no longer produces the returns that it once did, increasing competition and conflict among elites, and increasing the likelihood of crisis.

Diminishing returns to investment are also important in other theories of crisis. Where productive investments are concerned, such returns are often called 'profits'. Whether and why the profit rate tends to decline is a topic of lengthy debates, particularly among theorists of capitalist crisis (e.g. Mandel 1981; Hodgson 1991; Harvey 2015). But the key hypotheses all relate to a theory of diminishing returns, several of which are based on mechanisms already discussed above. Natural resource inputs become increasingly more costly, as does disposing of waste (Wallerstein 2000: 260; Moore 2015: 103-4, 162, 165). Profits are squeezed if wages rise (Turchin 2016; Wallerstein 2000: 258-259), by the higher taxation levied by the state in the face price rises (Goldstone 2016 [1991]; Wallerstein 2000: 261), by population growth, and by popular demands for education, health, pension, and social insurance (Wallerstein 2000: 261). Competition in general erodes profits, particularly as

the diffusion of technological innovations erodes the competitive advantage of early adopters (Modelski and Thompson 1996: 51-3, Modelski 2012: 67, 72-73). One theory of falling profits that is not directly related to previously mentioned diminishing returns links overaccumulation to declining demand: since goods cost more than wage earners are paid to produce them, wage earners eventually become unable to afford the goods that are produced (Wallerstein 1974b: 414-415; Amin 2010). Declining profits may in turn motivate a shift from investment to finance (Arrighi 2010 [1994], Van Bavel 2016), attempts at wage suppression (Alexander 2019) and direct coercion (Turchin and Nefedov 2009, Gill 1993), and can motivate territorial expansion in search of more resources, cheaper labour, and new markets (Amin 2010, Wallerstein 1974b: 414-415, Moore 2015).

But territorial expansion is itself thought to have diminishing returns. Transport and communication costs increase (Tainter 1988: 148-149). Expansion often meets increasingly organised resistance abroad, and tax rises to cover military costs can provoke revolt at home (Arrighi 2010 [1994]: 43; Moore 2015: 167). Co-opting oppositional groups creates further incentives for other groups to resist, making co-option ever more expensive and ever less worthwhile (Wallerstein 1974b: 412-3, 415). The scale of ecological damage increases, and the maintenance and regulation of a larger and more diversified system requires more complex organisation (Chase-Dunn and Hall 1997: 101; Cumming and Petersen 2017: 14). Such complexity is, of course, itself thought to be subject to diminishing returns.

Hypotheses of state capture posit that dominant groups in society increasingly use their wealth to acquire political power, and thereby the state's means of coercion (Van Bavel 2016: 21). This diverts resources away from productive investment and leads to economic stagnation or decline, as well as driving the closure of economic and political institutions, wage suppression and the distortion of markets, and increasing coercion which increasingly engenders resistance (Van Bavel 2016; Gill 1993). Some hypothesise that the decision of the wealthy to shift investment from production and trade to finance and coercion are motivated by declining profits in the more productive sectors of the economy (Van Bavel 2016: 278-9; Arrighi 2010 [1994]; Wallerstein 2000: 253). On this hypothesis, then, state capture is itself thought to be a consequence of the factors driving declining profits discussed above.

Table 5. Why scarcity crises occur: diminishing returns

| |
|---|
| Hypothesised factor |
| Resource acquisition, especially energy returns |
| Waste and pollution |
| Complexity |
| Labour |
| Elite overproduction (population growth, labour oversupply, wage suppression) |
| Profits (higher resource and waste costs; upwards wage pressure; higher taxation; competition; declining demand) |
| Territorial expansion (transport costs; external resistance; costs of co-option; ecological damage; complex organisation) |
| Declining profits drives state capture |

5.2. What influences the societal response to 'scarcity crises'

As with sufficiency crises, the openness of institutions is often hypothesised to influence the societal response to scarcity crises. In theory, reform is thought more likely in open societies, and more open institutions are thought to be better able to offer buffering feedback that aid stability, particularly if reforms promote economic and political equality, develop effective hazard management institutions, and limit elite infighting (Van Bavel 2019: 62; Butzer 2012: 3637; Middleton 2017: 340-341; Motesharrai et al 2014: 98; Witoszek and Midtun 2018).

In contrast, the lack of openness in partial and closed states is thought to increase the risk and severity of shocks. Partial or closed institutions decrease the likelihood of adaptation since wealthier and more

powerful individuals are motivated to uphold existing arrangements to protect their own interests (Butzer 2012: 3636; Van Bavel 2019: 62; Van Bavel et al 2018). Even where some adaptation does take place, the actions taken in partial and closed institutional arrangements often tend to focus on increasing the overall capacity of the economic system to recover from shocks. In the terms of my typology, we might describe this as an attempt to turn conditions of worsening ecological-economic scarcity into conditions of sufficiency. But without institutional reforms that increase equality, such attempts can actually result in reducing the economic and political openness of the system even further (Van Bavel 2019: 63). Since the wealthy and powerful are more insulated from shocks, and the poorer and weaker more susceptible to them, the deleterious effects of poorly managed crises can become a cascading feedback loop bringing ever more economic and social polarisation upon each iteration (Van Bavel 2019: 62 fig. S1.1.2; Van Bavel et al 2018).

Across literatures, the unity of elites is thought to increase the likelihood of entrenchment, and to decrease the likelihood of breakdown. When elites rally they are more likely to avoid the infighting characteristic of state breakdown, even if they are rallying in support of a military or authoritarian leader (Butzer 2012). As Turchin and Nefedov (2009: 314) put it, "as long as the elites remain unified, peasant insurrections, slave rebellions, or worker uprisings have little chance of success". But if elites are divided, and particularly if they undermine existing claims to legitimacy and mobilise the population against each other, then the chances of crises degenerating into breakdown increase (Butzer 2012; Turchin and Nefedov 2009; Turchin 2016; Arrighi 2010 [1994]: 43). The mechanism of 'elite overproduction' is thus an important hypothesised mechanism influencing whether elites entrench or whether they breakdown into infighting (Turchin and Nefedov 2009; Turchin 2016).

In partial and closed states, the misperception of rival elites' capabilities can also play a role in increasing the likelihood of breakdown into violence (North et al. 2009: 21). The risk is perhaps particularly high in partial states where rival factions have the capacity for violence but are systematically excluded from the state apparatus (Stewart 2005; Bodea and Elbadawi 2007: 23-3; Goldstone et al 2010; Hillesund 2019, 2021). As states breakdown, a cascading feedback loop may arise, with ever more infighting between rival elites over the spoils they extract, ever more coercive extraction from the general population, and ever declining productive investment. Fighting can enrich combatant elites whilst further impoverishing the poorest, with increasing economic and political polarisation further undermining the legitimacy of the state. Within the state itself, concentrations of power, institutional closure, and increasing extraction fuels resentment and increases the likelihood of social unrest (Gill 1993: 126; Van Bavel 2016).

World-system analyses emphasise that the concentration of wealth, the decline of productive profits, the shift to financialisation, and increasing conflict within states is also inherently connected with the conflict between core states and their peripheries. This is thought to take the form of forced and violent globalisation, anti-colonial and counter-hegemonic mobilisation, and growing competition and conflict between declining core powers and emerging rivals (Amin 2010, 2013: 8-9; Chase-Dunn et al. 2010: 81; Denmark 2021: 39). As hegemons decline, they increasingly attempt to use military power as a substitute for their waning economic power. This increases counter-hegemonic conflict with those who perceive this power to be exercised illegitimately. Sometimes the previous legitimising discourses used by hegemonic cores are themselves deployed by those who resist, both within states and from the peripheries, in an attempt to protect themselves from and to mobilise against exploitation and domination (Chase-Dunn et al. 2010: 81; Arrighi 2010 [1994]: 23).

The strength of global leadership and the relative strength of rivals are also factors influencing the course of global wars, where misperception of rivals capacities and intentions is again thought to play a role in precipitating war (Sarkees and Wayman 2010). Global wars tend to continue until a new hegemon establishes a period of relative peace and stability (Modelski and Thompson 1996: 51-3, Modelski 2012: 67, 72-73; Denmark 2021: 39).

Within states, a cascading feedback loop is proposed to occur as the delegitimisation of the state weakens state capacity, making it harder to deliver services to the population, harder to protect the quasi-monopolies that deliver profits to businesses, and harder to guarantee security. The more individuals take on responsibility for their own security, the more the state is delegitimised, with the individualisation of personal security particularly likely to form a "negative spiral" of cascading feedbacks of further delegitimisation and a breakdown into violence (Wallerstein 2000: 246, 264). Violence itself, as well as its potential to drive emigration and to disrupt food supplies, further increases tensions and resentments, and further undermines trust and the practices and institutions that formerly bound people together (Scheffer et al. 2021: 4-5).

Other mechanisms are proposed to explain the failure to adapt to changing ecological-economic circumstances, including the hubristic refusal to admit that change is necessarily (Johnson 2017) and the accumulated rigidities or ossification of state structures that hinder necessary adaptation (Holling 2001: 394-396; Root 2020: 87). Similarly, a 'sunk-cost account' suggests that a society in which people have heavily invested in expensive infrastructure are less likely to abandon these investments. Instead, they will try to rigidly maintain their previously successful strategies even in changing ecological-economic circumstances, thus making local depletion and collapse, when it does finally occur, appear all the more dramatic (Janssen et al 2003).

Some theorists note that many of the more deleterious effects of diminishing returns could, in theory at least, be avoided by instituting governance to protect natural resources or to regulate population growth (Chase-Dunn et al 2010: 72). Ecological-economic systems that expand faster than governance and regulation become misaligned and, in the absence of institutions of sufficient scope to prevent systemic disfunction, this increases the potential for collapse (Cumming and Petersen 2017: 14). Systems that do suffer extensive ecological exhaustion might face "prolonged periods of widespread social and economic distress and ecological crisis lasting for centuries" (Chew 2007: 6).

Table 6. Factors influencing the societal response to scarcity crises

| Hypothesised factor | Increased likelihood of |
|---|-------------------------|
| Open institutions | Reform |
| Relative economic equality | Reform |
| Closed institutions | Entrenchment |
| Elite rallying | Entrenchment |
| Partial institutions | Breakdown |
| Horizontal inequality | Breakdown |
| Elite overproduction (population growth, labour oversupply, wage suppression) | Breakdown |
| Factionalisation / elite fragmentation | Breakdown |
| Weakened state capacity | Breakdown |
| Hubris | Collapse |
| Ossification, rigidity | Collapse |
| Sunk costs | Collapse |
| Institutions of insufficient scope | Collapse |
| Ecological exhaustion | Collapse |

6. Consequences for state crisis research

I have constructed this unified theory of state crisis by integrating five broad literatures that each advance hypotheses regarding two questions: Why do crises occur? And what factors influence societal responses to state crisis? This paper contributes to attempts to answer these questions in three ways.

First, I have distinguished two fundamentally different varieties of state crisis: those that occur in ecological-economic conditions of sufficiency, and those that occur in conditions of worsening

scarcity. Emphasising this important but underappreciated distinction allows us to be sure that we are comparing *comparable* theories, and to avoid attempting comparison between theories intended to apply to substantially different kinds of state crisis.

Second, a perhaps a more minor contribution is my finding that so many theories of worsening scarcity rest on a common mechanism: diminishing returns. Though differences remain as to what is diminishing and why, it may prove fruitful to further investigate this commonality and to see if there are further interrelationships between the various theories of diminishing returns.

Third, and most importantly, the unified theory I here propose allows us to clearly distinguish the different factors that are hypothesised to contribute to state crisis. I have identified nine broad factors hypothesised to increase the likelihood of a sufficiency occurring (Table 2) and ten broad factors hypothesised to influence the societal response to sufficiency crises (Table 3). Similarly, I have identified seven kinds of shock (Table 4) and eight varieties of diminishing returns thought to make a scarcity crisis more likely (Tables 5), and fourteen factors hypothesised to influence the societal response to scarcity crises (Table 6). Different theories give different importance to different hypothesised factors. But beyond the fundamental distinction drawn between scarcity crises and sufficiency crises, there are no obvious contradictions between posited hypotheses. The concatenation of these hypotheses therefore constitutes a unified theory of state crisis, one branch of which offers an integrated theory of sufficiency crises, the other branch offering an integrated theory of scarcity crises. This unified theory establishes a framework for testing these competing but compatible hypotheses, with the ultimate aim of better understanding how our own society may resolve the ecological and political instabilities we now face.

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