

THE DARK SIDE OF INNOVATION

Guest editors

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BACKGROUND AND OBJECTIVE

It is often assumed by scholars and policymakers that innovation is good because of its potential role – distinct from the role of economic growth in general – in enhancing productivity and efficiency in the use of inputs. Academic research usually presents innovation in a positive light. The popular press is often over-optimistic about new technologies and contains much hype. Many governments seek to maximize aggregate R&D investments and patent counts.

Innovation, however, is inherently uncertain. Some innovations may impose unpredictable costs on society, and their transformative nature may render it difficult to anticipate their overall effect once diffused (Binder & Witt, 2011; Mulgan, 2016). This calls for a cautious approach towards their regulatory approval, according to the 'precautionary principle' (Stirling, 2017). Indeed, innovative substances and materials are increasingly artificial and complex, and their integration into the environment is often not well understood. Despite the increased need for the precautionary principle, this often comes under pressure from corporate lobbying.

Business ethics are an important factor (Brusoni & Vaccaro, 2017). Not all of the adverse consequences of innovations are unpredictable, and many derive from deliberate and unethical actions, as shown by the recent scandal involving Volkswagen innovating to cheat on diesel emissions and meet regulation standards. Other harmful effects of innovation may be simply associated to the lobbyist power of large companies; while there may be a number of irregularities involving clinical trials underpinning Philip Morris' application to the U.S. Food and Drug Administration for its new smoking devices, the World Health Organization reports that "the tobacco industry continues to subvert government attempts to prevent tobacco-related deaths".

Over-enthusiasm for (new) technologies may also overlook the longer-term effects of new technologies. For example, environmental costs due to mining or disposal of batteries are rarely cited when discussing electric cars.

Well-known problems may be reinforced or take new forms due to technological development, such as pollution, electronic waste, or AI algorithms that perpetuate racism and sexism (Didier et al., 2015). These negative consequences can operate at the social or global scale, such as climate change or (economic) inequality, technological unemployment and skill polarization, or at a more personal scale, as in the case of the so-called hyper-competition leading to employee stress (Dahl, 2011).

Research into the 'dark side of innovation' could also take an empirically-driven approach, and document unexplained problems that are increasingly important in industrialized societies, e.g.: unexplained rise in asthma (Holbreich et al., 2012), the unexplained rise in anaphylaxis (Lee et al., 2017), and the secular decrease in male sperm counts (Levine et al., 2017).

Some negative effects seem more specific to the new technologies and the way the economy (and societies) has been transformed. Cybersecurity, fake news, the erosion of privacy, excess government monitoring and the decline of democracy are new threats brought about by the digital revolution. At the same time, network effects, digital monopolies (e.g. Google and Facebook), problems caused by a flawed patent system (Boldrin & Levine, 2013), and lack of competition in global markets may stifle creative destruction.

However, new technologies are not only digital; new artificial additives, hormones and nanotechnologies in the food and health industries are just the most visible examples from other industries. Some of the new technologies may have harmful unintended side effects.

These inconvenient truths need to be addressed head-on. Recognizing that innovation may come with associated risks and unintended consequences (Witt, 1996; Giddens, 1999; Martin, 2016; Mulgan, 2016) is a necessary step towards a more responsible approach to innovation (Stilgoe et al., 2013). Work is now needed to alert attention to potential dangers, to recognize the harmful effects of innovation, and to clarify the circumstances under which innovation may be beneficial or detrimental for the society.

We encourage unorthodox, interdisciplinary and potentially controversial approaches. Submitting authors can be assured their contributions will be evaluated sympathetically, even if they make potentially heretical attacks on some foundational assumptions. Submissions can take many forms:

- Empirical papers
- Theoretical models and simulation models
- Experimental evidence
- Essays and literature reviews
- Case studies and industry studies of hazardous innovations

RESEARCH TOPICS

The “dark side of innovation” remains largely unexplored, and we do not want to limit the special issue to a set of specific themes. Nevertheless, a list of possible topics could include:

- Uncertainty and/or overenthusiasm surrounding new technologies
- The unpredictable and harmful effects of innovation
- The uses and abuses of the precautionary principle
- Issues and difficulties in regulating new technologies
- New technologies, network effects and/or monopoly power
- Business ethics and new technologies, and firms deliberately misleading regulators and consumers
- The role of corporate lobbying in relation to new technologies
- Unexplained facts where the root causes may be not yet clear (e.g. long-term unhealthy trends in industrialized societies)
- Innovation indicators: shortcomings, solutions, new proposals
- Problems relating to possible misdirection of research and innovation activity
- New technologies, new challenges (e.g. new types of pollution, addictions, societal effects)

IMPORTANT DEADLINES

- Submissions to the Special Issue due by 6 January 2019
- Publication of the Special Issue in 2020

SUBMISSION PROCESS

Paper submissions will undergo rigorous editorial screening and double-blind peer review by a minimum of two recognized scholars. The standard requirements of *Industry and Innovation* for submissions apply. Please consult the journal submission guidelines available at <http://www.industryandinnovation.net>.

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