



Research Article

Applying the Transaction Cost “3P” Theory to the Economics of Genomics Medicine

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Abstract

The Transaction Cost Political approach called “3P theory” focuses on the inclusion of political processes, integrating bargaining or countervailing powers of major economic actors on the supply side and main stakeholders on the demand side in medical markets. It leads to consider Politics as one of the main Ps of the marketing strategy of firms, so it modified the traditional marketing mix of companies with respect to valuing and positioning products and services; pharmaceutical companies, in such regulated markets, need to provide an Acceptable Cost/Benefit Ratio or Benefit/Risk ratio to gain market access, get approved by the regulatory agencies and then be accepted for reimbursement by public and private payers. An additional contribution of the “3P TCP theory”, to explain the medical market dynamics, is to also consider the Ps on the demand side: they include the responses of professionals and patients and can also be called 3P: P for Physicians, P for Pharmacists and P for patients. In each system, the critical decision points at individual level, may differ, as well as cost reduction strategies towards affordable access to medical products and services for the patient. This paper proposes a reflection on issues to apply this type of analytical approach for the economics of genomic medicine, since the growth of genomic, genetic and other life science data leads to medicine. paradigm shift towards precision medicine and emphasize the individual level of strategic decision making in learning health systems. Therefore, it may benefit from such a Transaction Cost political analysis, between players, at individual level of decision makers and their interactions.

Keywords

Transaction Cost Politics, Health Policies, Economics of Genomic Medicine, Transaction Cost 3P Theory

1. Introduction

The 3 P theory, an emerging theoretical development originated from Transaction cost political theories for health policies, following visits to the USA [1-7]. It was presented at a keynote lecture in a French Polish conference on quality in

Medicine, at the Polish Academy of Sciences in Paris in April 2022, in an international comparative analysis of the functioning of pharmaceutical systems.

The academic community and technologists attending the

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event found this emerging theory interesting for the biopharmaceutical sector, and this paper is a response to their questioning; it explores whether it can help the field of economics of advanced genomic medicine. This field is revolutionized by big data in life sciences and the biotech revolution, especially with the inclusion of genetic and other genomic data, and the development of BioIT platforms and software.

Transaction cost theories such as [1, 2, 5] or [8] with her contribution on an emerging 3P theory, focus on the understanding of political processes, for instance in health policies for a better understanding of health care financial systems. However, in addition to public policy making processes, ICT diffusion in health systems also gives a critical role to software developers (especially in Bioinformatics); the deployment of AI system impacts IT architecture, costs and benefits of systems and health care organizations. For instance, the implementation of platforms such as portals inside hospitals, to manage primary and secondary uses and re-uses of large bio-data sets also induce important organizational changes. This paper provides some insights to identify under which conditions Transaction Cost Politics' theories are a useful approach for medical market analysis.

2. Brief Review of the Contributions of Transaction Cost Theories for Health Policies

This section provides a brief history on the contribution of the field of transaction cost politics within the various economic contribution on transaction costs; then it will show the way digitalization and diffusion of ICT in a health system can use such theoretical framework to analyze the cost reduction and under what conditions it can lead to more efficiency.

The 3P theory focuses on the inclusion of political processes, integrating bargaining or countervailing powers of major economic actors on the supply side and main stakeholders on the demand side [7, 9]. It contributes to the field of Transaction Cost Politics, originating with Prof Professor Dixit's papers. In a normative approach to policy analysis, the importance is given to evaluation criteria, social welfare is describing an increasing function of individual utilities; welfare economics could be reached using competitive markets. Currently, welfare economics faces criticism because market forces often fail to provide fair and equal access to goods and services, especially for medical technologies.

The review of all theoretical developments which integrate various constraints on governmental actions is beyond the scope of this paper; they deal with regulated industries, the limit of tax instruments available to government, the incomplete and imperfect information. These types of economic theories do not include the political process, and the role of government is seen as technical.

Professor Dixit's main contribution to Transaction Cost Politics (TCP) is offering a perspective that blends elements of both normative and positive economic policy theories; Economic policy making is seen as an «ongoing, imperfect and incomplete process» with powerful stakeholders, but slow dynamics. He also brought the political process and examined not only the economic market failures that lead to regulatory forms of intervention, but also the political failures.

A formal modeling of a political process of economic policy making is known especially with the capture theory developed by authors such as [10] and Pelzman's review of Stigler after Fifty Years [11] or some positive economy in the field of macroeconomic, fiscal, and monetary policies (e.g. contributions of Downs, Buchanan and Tullock by [12]) or on national accounting research (e.g. [13, 14]). A second approach is a public interest 'theory, which analyzes the pressure groups on the demand side of markets. These theories mainly aim to explain the way governmental agencies and parliaments or congresses are influenced either by economic stakeholders or by NGOs or consumerist groups, representing consumer voices.

The contribution of the 3P theoretical TCP framework [6-9] also includes political processes to improve the understanding of the pharmaceutical systems, and their dynamics. But, in this case, it considers the bargaining processes between Big Pharma and regulatory agencies, using different layers of information. It leads to consider Politics as one of the main Ps of the marketing strategy of firms, so it modified the traditional marketing mix of companies with respect to valuing and positioning products and services; pharmaceutical companies, in such regulated markets, need to provide an Acceptable Cost/Benefit Ratio or Benefit/Risk ratio to gain market access, get approved by the regulatory agencies and then be accepted for reimbursement by public and private payers. The level of acceptability is a political process, it leads to strong lobbying actions at different levels of international, regional and states and is not only related to superior quality or efficacy. This approach uses a level of analysis of the operational marketing policies to understand the functioning of the markets in an institutional environment. It can be related to contributions of New Institutionalism. The legal environment of pharmaceutical systems, especially the legal status of medicines, in various countries, influences how firms adjust their marketing strategies (e.g. longer supply of prescriptions, more self-medication, etc.). This framework focuses on mechanisms of influences on policy making processes, especially using behavioral economics as in nudging policies in health policy [15, 16] or [17], who explain cost-sharing architecture in health care financing and burden on individual choices.

An additional contribution of the "3P TCP theory", to explain the medical market dynamics, is to also consider the Ps on the demand side: they include the responses of professionals and patients and can also be called 3P: P for Physicians, P for Pharmacists and P for patients. In each system, the critical decision points at individual level, may differ, as well as cost reduction strategies towards affordable access to medical

products and services for the patient. The European case studies showed that an interaction on economic topics may happen at different decision points and different stages, between the Patient and the Physician, or rather a discussion at the dispensing point, between the Patient and the Pharmacist, or simply leaves a Patient who prefers to wait. The identification of various individual strategies initiated by Physicians, Pharmacists or Patients in each system, was useful to understand the functioning of the demand side of the pharmaceutical market in chronic conditions, in response to the way pharmaceutical companies also use their marketing Ps towards providers and patients, possibly with direct-to-consumer type of policies.

3. Transaction Cost Political “3P” Approach and Advances of Genomic Medicines

This section brings some reflections to understand whether this type of transaction cost political approach at the level of firms, professions and patients, is useful in the move towards advances in genomic medicine, with the biotech revolution and the use of data driven platforms.

First, the growth of genomic, genetic and other life science data leads to medicine paradigm shift towards precision medicine. Therefore, it may benefit from such a Transaction Cost political analysis, between players, at individual level of decision makers and their interactions; then, to be useful at a system or macro level, it needs statistical modeling such as Random Utility Models (RUMs) [9], recent developments in Preference learning and Random Preference Modeling (RPM) or recent decision process models incorporating behavioral issues [18]. The digitalization of health systems and deployment of AI inside organizations also facilitates the aggregations of individual levels. However, AI risks associated with this process need to be controlled.

Another consequence of advances of genomic medicine is the increase in sequencing technologies and genomic or genetic data. It leads to more testing. For the health system, it introduces more decision makers or may impact the relationships between the various professions. For instance, lab directors or private companies interpret test results, physicians may also need to share the tests results with geneticists. Powerful players such as Google may meet patients' expectations who push to be first to get data, such as their genetic profiles, which provide access to ancestry knowledge; they may then bypass the professionals in such cases (e.g. google 23 and me).

The advance of such genomic medicine also brings transformation or creation of new types of organizational forms. We can provide for instance the case of a portal to manage biospecimens, studied in a project in Dutch hospitals in the DNTB-BBMRI project [19]. The use and the re-use of more data and more specimens lead to creating platforms with the help of software developers. The Portal for biospecimens changes professional responsibilities by eliminating some

tasks and reducing transaction costs, but it also introduces new duties that may increase administrative workload and bureaucracy (e.g. more committees to check the data). So, on the economic side, it is not obvious whether this can lead to a more economical use of health care resources, at the level of a health care organization such as a hospital.

However, as discussed by [20], the growth of sequencing technology also generates gaps from data generation to data analytics, especially in bioinformatics departments of healthcare organizations. So, Cloud computing technologies are often additional technologies for health care organizations, with not sufficient ICT infrastructures. Using Cloud computing for genomics may change the role of software developers and the relationships inside the value chain in healthcare, reducing transaction costs inside the organization but relying on powerful external players. Further research is needed to investigate whether different power games may change the interactions between these new players and the conventional data providers and users.

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Author Contributions

Christine Claude Huttin is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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Biography

Christine Claude Huttin created a scientific enterprise (R&D), partly from a European evaluation network on Pharmaceutical Policies, in Cambridge, Mass/USA and recently a branch in Luxembourg, for decision tools on economic topics in health systems, disease econometrics and choice modeling, economics of genomic medicine, evaluation methods. She holds a BS, MBA (ESSEC), PhD (EHESS, pol Econ-Bus), Harvard Takemi 95 and is emeritus prof at Aix-Marseille university, France, after academic posts in Paris university. She is guest editor of *Technology and Health care* from Sage/Ios Press journals. She received mandates from Governments, the European Union (DG Grow, DG research, European Parliament research services), Competition authorities (FTC) and had several consulting services for WHO, World Bank and companies. At the Polish Academy of Science conference in Paris in 2022, Professor Huttin gave a lecture presenting the emergence of a theoretical framework in the field of Transaction Cost Politics. This paper presents some reflections on how this framework could incorporate genomic medicine.