Climbing down the ladder: a meta-analysis of policy instruments applications

Claudia ACCIAI
Scuola Normale Superiore
claudia.acciai@sns.it

Giliberto CAPANO
Università di Bologna
giliberto.capano@unibo.it

Abstract

The main goal of this paper is to trace the development of different approaches used for policy instruments. Through a systematic review of the main literature in the field, we shed light on different operationalizations of the main conceptualizations and classifications of policy instruments. Although the literature describes a large number of policy instrument taxonomies, many of these categories remain at the top of the ladder of abstraction and act as theoretical guidelines rather than operational concepts that can help disentangle the different features of governing actions. Therefore, the paper aims to provide an accurate review of the conceptualization of policy instruments. Through a meta-analysis of sources screened according to the PRISMA methodology, we both investigate different empirical applications of policy instrument typologies and classify their practical usage. The main result of this meta-review shows that three typologies (Vedung, Salamon, and Schneider and Ingram) are not only the most frequently cited but also the most frequently adopted for empirical analysis.

1

1. Introduction

In this paper, we conduct a systematic review and meta-analysis of the applications of policy instruments' conceptualizations and classifications. Clearly, the main reasons for undertaking systematic reviews and meta-analyses are to minimize bias and maximize data by collating all the relevant, available evidence on a particular topic (Askie, Offringa, 2015:403). Policy instruments are appropriate for this type analysis due to the consistent number of studies that have defined policy instruments and classified them (and analysed their theoretical and empirical uses). Indeed, we aim to classify the empirical evidence on the impact of various classification systems used for policy instruments. Our aim is to assess which conceptual treatments have been more adopted by scholars for empirical analysis to interpret and/or explain specific events (for example, the choice of policy instruments, the content of policy design, and the performance of policy adoption). Empirical evidence on the application of policy instrument typologies are important not only because of their descriptive and analytical value but also because they allow scholars to raise questions about the different types of empirical usage of the most relevant typologies found in the existing literature. These questions include the following: Why have some typologies been used more often as interpretive tools or as operationalized empirical frameworks than others; does it depend on the free choice of the scholars or is it due to the characteristics of the typologies themselves?

In this analysis, we aim to provide an exploratory and descriptive overview of the state of the art policy instrument typologies in an effort to understand the effective application of these concepts and their contribution to explaining governing actions.

This paper is organized as follows. In the second section, the topic of this paper is introduced by presenting the relevance of policy instruments for public policy, the main questions that should be answered by the meta-review and the typologies chosen to be reviewed. In the third section, the PRISMA methodology is presented together with an analysis of the inclusion and inclusion criteria that lead to the construction of a final sample of 310 papers. In addition, the criteria used for classifying policy instrument typology applications are described. In section four, the findings of the meta-analysis are presented, and in section five, these findings are discussed. Finally, in the conclusion, some observations regarding the empirical relevance of the conceptual treatment of policy instruments are provided, paving the way for further investigations in this field.

2. Typologies of policy instruments: they are necessary, but how are they used?

2.1. Policy instruments used in public policy

Policy instruments have become a fundamental topic in the public policy field. Indeed, policy instruments can be considered as "an identifiable method through which collective action is structured to address a public problem" (Salamon 2002: 19), "a set of techniques by which governmental authorities wield their power in attempting to ensure support and affect or prevent social change" (Vedung 1998: 21), or the means governments use "to deliberately affect the nature, types, quantities and distribution of the goods and services provided in a society" (Howlett 2000: 415). All of the most commonly used and prominent definitions of policy instruments agree that instruments refer to the capacity of governments to "get things done", regardless of individual preferences. Policy instruments are thus the way through which governments do their job to steer policies and try to change the performance of existing policies. The relevance of policy instruments (in every stage of policy-making) has progressively been recognized because policy instruments represent one of the main research topics that policy scholars investigate. First, because policy instruments represent the way through which governments enact policies, there is concern regarding the types of instruments they have at their disposal for doing their job (Howlett 2011). Second, it is unclear why and how policy-makers adopt some policy instruments and not others (Salamon 2002; Hood 1987; Linder and Peters 1989, 1998 Capano and Lippi 2017). Third, policy effects and the performance of the adopted instruments are complex issues that need to be considered (Bressers and Klok 1988; Campbell, Johnson, and Larson, 2004; May et al. 2005; Jordan and Matt 2014). Finally, the potential independence of policy instruments with respect to their context should also be considered. Indeed, in these cases. policy instruments are considered to be institutions to the extent that they represent different social and political values and potentially imply meanings and values contributing to the construction of reality (Lascoumes and Le Galés 2004; 2007).

Therefore, policy instruments have become pillars of public policy analysis both when the focus is on the characteristics of policy-making, policy dynamics and governance shifts and when the focus is on policy design. On one hand, policy instruments have been analysed because they help us understand how and why policy dynamics develop, how and why governance modes change over time (Le Galés 2011; Capano, Howlett and Ramesh 2015) and how policy actors aggregate around specific policy instruments (Beland and Howlett 2016). On the other hand, a renewed policy design perspective has focused its attention on the different combinations of policy instruments and on the reasons for using different policy design styles (Howlett and Rayner 2013, 2017; Schmidt

and Sewerin 2018). Finally, there is an increasing number of empirical studies on the effectiveness of policy instruments, especially in sectors such as innovation policy, environmental policy and climate change policy (Jordan et al. 2003; Flangan et al., 2011; Borras, Edquist, 2013; Edler et al., 2016; Rogge, Reichardt, 2018).

2.2. How have the typologies of policy instruments been used? A meta-analysis is needed

Studies on policy instruments include many with rich classifications that have proposed different ways to conceptually categorize the extension of the policy instruments concept and have identified specific connotations and denotations that make the concept of policy instruments not only theoretical viable but also allow its operationalization for empirical research.

This study begins with a sectorial inventory of 63 economic policy tools (Kirschen et al. 1964), and is thus based on the theoretical perspective of Doern and Wilson (1974), who for the first time clearly focused on coercion as the criterion through which policy instruments were classified. Many other classifications and typologies have been proposed and are based on different criteria and conceptual treatments. Very often, these typologies are influenced by the common background of the theoretical knowledge of policy scholars, which is used as a reference both when policy instruments are the focus of the analysis and when they are simply marginally cited.

However, one may be left with the impression that policy instrument typologies and classifications are used more for their descriptive usefulness rather than as a guide for theoretical and empirical analysis. In addition, very often, the different classifications of policy instruments have been considered substantially equivalent, even though they are based on different criteria regarding their theoretical treatment and define and order policy instruments in quite different ways. Overall, there are so many typologies and classifications that there is something for everyone and for every type of research on policy instruments. This variety, not unexpected in a social science, is simultaneously a strength and a weakness of the analysis of policy instruments. On one hand, this variety is a strength to the extent that it provides a broad theoretical landscape and thus the opportunity to grasp different aspects of reality. On the other hand, this variety is a weakness because it deeply constrains the accumulation of knowledge both from the theoretical and empirical point of view, which means, for example, that it is difficult to both compare many different types of classifications in the policy field and develop a common scheme for the operationalization for different types of policy instruments across various policy sectors. Finally, because of these weaknesses, the prescriptive contribution of policy instruments in term of policy design is disputable.

However, these impressionistic considerations have, thus far, not been supported by an analysis of the typological proposals in the public policy literature. It is unclear whether they have been used more for theoretical arguments or for empirical research. It is also unclear whether one or more typologies are more prevalent in empirical studies. Furthermore, it is unclear whether the choice of the adopted typologies depends on individual preferences or is linked to the characteristics of the policy field.

Addressing these unknowns, understanding the state of the art of policy instrument typologies and classifications, and identifying the heterogeneity characterizing this field of research are the goals of this exploratory analysis. Indeed, we believe that this theoretical analysis of classifications could be an important contribution that will lead to a deeper understanding of the historical evolution of policy instrument studies.

2.3. The chosen typologies

To proceed with our meta-analysis, we selected eight policy instrument typologies. We based our choice on the representativeness of the typology (in terms of specific coverage) and on the basis of the criteria on which the conceptual treatment hinges upon. Furthermore, we selected only among general typologies and excluded those mainly focusing on a specific policy field, for example, the classification of new environmental policy instruments (Jordan, Wurzel, and Zito 2005).

Regarding the criteria of conceptual treatment, it should be noted that although each typology is unique, each includes a clear reference to the degree of coercion embedded in policy instruments, while some are based exclusively on coercion; therefore, this was the first criterion of selection. The second conceptual treatment of policy instruments is the focus on governing resources, on the basis of which instruments are designed. In some instances, this focus is combined with either the behavioural motivations that are the target of the instrument or a multidimensional perspective, which allows great freedom in the classification according to the author's preferences and research questions.

By selecting typologies that meet these four criteria, we exclude some well-known typologies on the basis of the consideration that they are "embraced" by those that have been selected. This is the case, for example, for van der Doelen's (1998) typology of stimulative and repressive instruments, which we consider to be included in the more general Vedung classification and the case of the McDonnell and Elmore typology (1987) that is based on the behavioural nature of policy instruments, which we consider to be less general than the Schneider and Ingram theoretical classification.

2.3.1. Coercion

For the two most relevant classifications based purely on coercion, we chose those proposed by Phidd/Doern and Vedung.

The classification of Phidd and Doern (1983), which can be considered as a final result of the classification started by by Doern and Wilson (1974), assumes that "politicians have a strong tendency to respond to policy issues (any issue) by moving successively from the least coercive governing instrument to the most coercive" (Doern and Wilson 1974, p. 339; Phidd and Doern 1983, pp. 128ff). These scholars argued that all the governments of liberal democracies involve some degree of imposition or coercion and that politicians generally prefer to use the least coercive instrument possible. This classification identifies five types of policy instruments, and within these broad five categories, Doern and Phidd identify as many as 26 finer "graduations of choice" such as grants and subsidies, guidelines, and speeches (p. 112). Some of these categories are reported in Table A of the Appendix, where five types of policy instruments are presented.

The three categories proposed by Vedung (1998), which include sticks, carrots, and sermons, are also based on the degree of coercion as the main identifying criteria. The author based his proposed classification of policy instruments on organizational power, as proposed by Etzioni (1961), who distinguished between coercive, remunerative, and normative power. Thus, Vedung divided policy instruments into three mutually exclusive classes: regulative instruments, economic instruments, and informational instruments. According to this logic, the criterion of conceptual treatment is the extent of coercion because "The authoritative force concerns the degree of constraint, or even better, degree of power, that the governing body has invested in the governance attempt. In principle, regulation is more constraining for addressees than economic means, and the latter are more constraining than information. A ban on the production of cigars is more constraining than a tax levied on the production of them, which is in tum more constraining than information to the effect that these means of sensual gratification should not be produced" (1998, p. 35). The specifications proposed by Vedung for each type of policy instrument are presented in Table B of the Appendix.

2.3.2. Resources

Christopher Hood (1983; 1986) proposed his well-known NATO typology based on the "resources" governments have at their disposal: *nodality* (being at the centre of an information network), *authority*, *treasure* and *organization*. The resulting four families of instruments also distinguish between detectors (when information is extracted from reality) and effectors (when reality is affected).

It is well known that in a book published in 1983, Hood and Helen Margetts presented a version of the original typology with more analytical attention to its application to the digital age. We included this version in our meta- review because its attention to digital technologies is particularly interesting and promising for applications concerning the role of communication and media in policy-making (both of the NATO typologies are presented in Table C of the Appendix).

The NATO typology was partially amended by Michael Howlett, who included the concept of procedural tools. According to Howlett, substantial tools are those that have a direct effect on reality, while procedural instruments are designed to "indirectly affect outcomes through the manipulation of policy processes" (2000, p. 413). Howlett proposed two different specifications of the NATO typology. The first one classifies negative and positive procedural instruments on the basis of the government resource on which they depend (Howlett, 2000). The second one distinguishes between substantial and procedural instruments (based on the criterion of the purpose of the tools) to classify instruments according to the four government sources proposed by Hood (see table D of the Appendix) (Howlett,2011). Due to these differences, we feel that it is meaningful to include different typologies of "Howlett classifications" in our exploratory investigation.

2.3.3. Behavioural motivations

Schneider and Ingram, by following an approach that emphasizes the "behavioural dimension" of policy instruments[1], proposed a typology based on the motivations of individuals when deciding their behaviour. Schneider and Ingram based their proposed typology on the assumption that there are five motivations that cause individuals to not behave as expected: "they may believe the law does not direct them or authorize them to take action; they may lack incentives or the capacity to take the actions needed, they may disagree with the values implicit in the means or ends, or the situation may involve such high levels of uncertainty that the nature of the problem is not known, and it is unclear what people should do or how they might be motivated" (1990, p. 514). Consequently, governments can address these misbehaviours with five types of specific instruments: "by providing authority, incentives, or capacity; by using symbolic and hortatory proclamations to influence perceptions or values; or by promoting learning to reduce uncertainty" (*ibidem*). Table E of the Appendix presents the definitions and elements characterizing these five types of tools.

---

[1] Bardach (1979) proposed four behavioural based instruments: prescription, enabling, positive incentives, and deterrence. In addition, McDonnell and Elmore (1987) identified four types of behavioural instruments: mandates, inducements, capacity, and system-changing tools.

Salamon (2000, 2002) proposed using a multidimensional perspective for classifying policy instruments; according to this scholar, "any given policy tool is a package that contains a number of different elements" (2000, p. 1643). These elements include the type of activity, the delivery vehicle through which this activity is done, the delivery system, and a set of rules that regulate the entities included in the delivery system. Because policy instruments are so complex and intrinsically multidimensional, Salamon suggests that their classification should recognize these characteristics: "multiple classifications of tools are entirely appropriate since different classifications will highlight different facets" (Salamon 2000, p. 1646). Thus, the classifications should be developed in two steps: "first, basic descriptive features can be used to define different tools; and second, various dimensions can then be identified in terms of which various tools so defined can be grouped together for analytical purposes" (p. 1646-47). The description can thus produce a relatively long list of instruments that can then be classified. The dimensions for the classification proposed include the degree of coerciveness, directness, automaticity, and visibility. Table F of the Appendix shows an example of this method by presenting a classification of policy instruments based on the degree of coercion.

Table 1 summarizes the characteristics of the selected conceptual treatments of policy instruments.

Table 1 The eight typologies selected for the meta-review

	Vedung (1998)	Hood (2007)	Hood and Margetts (1987)	Howlett (2000)	Howlett (2011)	Salamon (2000; 2002)	Schneider and Ingram (1990)	Phidd and Doern (1983)
Classification criteria	Coercion	Government resources	Degree of activity of government/ government resources	Principle use/ government resources	Purpose of tools/government resources	Coerciveness, directness, automaticity, visibility	Individual motivations	Coercion
Meaning of policy instrument	Set of techniques by which governmental authorities wield their power attempting to ensure support and affect social change. They are ends in themselves because they represent the content of the political debate	Means through which governments attempt to shape the lives of its constituents. They are about social control	Means through which governments attempt to shape the lives of its constituents. They are about social control	The techniques and devices governments use to implement policies and achieve their goals	The techniques and devices governments use to implement policies and achieve their goals	Identifiable methods though which collective action is structured to address a public problem. They define the actors centrally involved in particular type of programmes and the formal role they will play	Techniques that address the problem that people are not taking the actions needed to ameliorate social, economic or political problems	Means for the management and manipulation of legitimate coercion
Type	Regulation, expenditure, information	NATO: Nodality, authority, treasure, organization	NATO Nodality, authority, treasure, organization	Positive/negative procedural NATO instruments	Procedural/substantive NATO instruments	Because of the multidimensionality of policy instruments, no single classification is possible, and these schemes will differ depending on which facet is used as the basis	Authority, incentive, capacity building, symbolic, learning	self-regulation, exhortation, expenditures, regulation (including taxation), public ownership.
Tool dimension	Action content: what the target population should do. Authoritative force: degree of power governments employ to obtain compliance	Defectors: instruments (used to gather information) Effectors: (used to modify behaviours)	Detectors: instruments (used to gather information) Effectors: (used to modify behaviours)	Procedural instruments indirectly influence policy outcomes through the manipulation of the policy process	What they do: substantive instruments modify the distribution of goods and services How they operate: procedural instruments indirectly influence policy outcomes through the manipulation of policy processes	Type of good delivery; delivery vehicle; the type of organization designated to provide the service; a system of rules defining the relationship among the actors involved	Different assumptions about how policy relevant behaviour can be fostered by the target population by providing: legitimation of authority; tangible payoffs (positive or negative); resources to enable individuals to make decisions; alternative values and beliefs (persuasion)	Visibility, historical context, politicians prefer less coercive instruments

It is worth noting that policy instrument typologies do not simply vary regarding the extent of the items used in the classification because they represent various theoretical approaches to the study of governing action. Indeed, borrowing an expression from Hood (2007), different policy instrument typologies "are ways of doing different kinds of analysis, rather than different ways of doing the same kind of analysis" (p. 141). As exemplified in this statement, there are different approaches that can be used to study policy instruments; these approaches diverge on the basis of the lenses through which they view social phenomena and the reason for the action.

Therefore, there is no superior policy instrument typology, but simply a variety of instrument typologies, which might be more or less appropriate for different empirical analyses, due to the different emphasis they put on various aspects.

3. Methodology

To better understand the patterns of the empirical applications for different types of policy instrument typologies, we adopted the preferred reporting items for systematic reviews and meta-analysis (PRISMA) methodology.

PRISMA is an evidence-based minimum set of items used for reporting systematic reviews and meta-analyses[2] and can be described as a thematic procedure for meta-analysis seeking to uncover concepts and their meanings from the data by using interpretative approaches for analysing the data (Carey, Crammond, 2015:1021). PRISMA is based on a set of different exclusion and inclusion criteria, through which it is possible to systematically synthesize evidence from the existent literature on a given domain. By applying this methodology, we were able to construct a sample of sufficiently similar sources from previous studies on this topic for an explorative analysis to determine how different policy instrument typologies have been applied to explain real world phenomena.

Since at present there is not a unique established method for qualitative research synthesis (Carey, Crammond, 2015; van der Heijden, Kuhlmann, 2017), we believe that to simplify the sampling procedure and to eventually allow for future replications and advancements in this field of research, a systematic explanation of the selection criteria we adopted is needed. Therefore, below, we describe the characteristics of the PRISMA methodology, its application for our analysis and the procedures adopted for the analysis of the final sample.

---

[2] http://prisma-statement.org/ (May, 2018).

3.1 The PRISMA methodology tree: exclusion and inclusion criteria

To collect our data, we relied on two internet databases, namely, the Web of Science and Scopus. These databases were selected because they are the largest databases sources in existence, in terms of the number of journals they include (Falagas, et al., 2007; Faling et al. 2018)[3].

For both databases, we collected all the sources that quoted any of the typologies included in our analysis, which means that we ran search queries for each (or combinations of) paper used as a "theoretical reference". Then, we screened the resulting sources by language (English) and by article type, including published research papers, books and book chapters[4].

Overall, the eight sources selected are representative of the most relevant instrument typologies in the literature and have been consistently used in the literature. Indeed, after the elimination of duplicate records within and between the Web of Science and Scopus, our sample included N=1555 sources (see Figure 1).

Next, through a screening procedure, we eliminated all sources not containing an abstract and papers previously published by the authors of this article; therefore, our sample included a total of N=178 sources.

The preliminary source analysis regarding the abstract represents a useful quality criteria assessment to the extent that it allows us to remove from the sample all the articles that, despite quoting one of our reference articles, do not mainly refer to the policy instrument literature.

To narrow our analytical focus to studies that consider policy instruments, we reduced the sample of interest to articles including in their abstracts keywords related to the policy instrument literature, such as instrument* (which also included cases of instrumentation), tool and device (for a total elimination of N=937 sources).

---

[3] For additional and detailed information on the comparison of different web databases, please see Falagas, et al., 2007.
[4] The detailed retrieval process of our initial sample is summarised and documented in table G the Appendix. Each retrieval procedure is organised by source and by database, together with a brief explanation of the keyword research strategy adopted.

Figure 1 Flow diagram
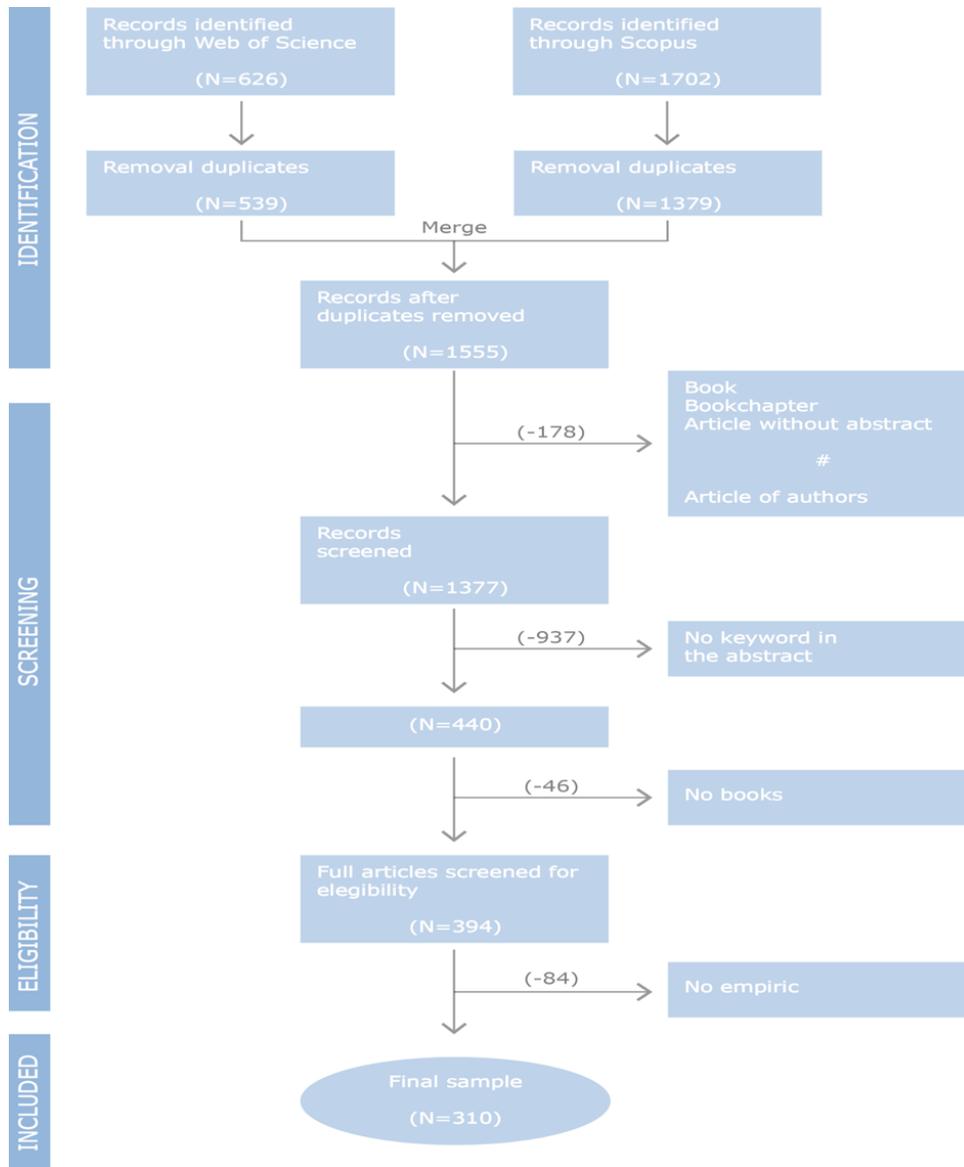
Then, to allow for a comparable and easily accessible dataset, we further delimited our sample by deleting all those that were the source type "book", for a total of N=46 items. Given the exploratory nature of this research, we decided to focus mainly on published journal articles, which allowed us to construct a highly comparable sample of sources and consider the possibility of including books and book chapters in future versions of this study.

At this stage, the sample included N=394 articles; we assessed the eligibility of each article by analysing the whole text and by classifying each one according to whether the source represented an empirical contribution or not.

To be classified as an empirical analysis, each unit of analysis must fulfil a certain condition.

The study must have collected qualitative or quantitative data on a given phenomenon that was under investigation or, in the case of research developing new theoretical contributions, it had to at least provide an empirical example of the theoretical claims made. As an alternative, the study either had to produce evidence related to the concrete application of policy instrument studies to real-world events or had to be an analysis of a given policy instrument through the lens of policy instrument theory [5].

To ensure the analytical accuracy of the study, any discrepancy in the interpretation was jointly discussed by the two authors of the present study[6].

Following the procedures described above, N=84 articles were excluded from our sample, which ultimately consisted of a total N=310 sources.

Following the exclusion and inclusion criteria prescribed by the PRISMA methodology, the final sample of our analysis includes journal articles quoting at least one of our "theoretical references" and addressing the policy instrument literature with an empirical approach.

3.2 The analysis of the sources: looking for policy instrument applications

Since the ultimate goal of this research is to understand the extent to which different policy instrument typologies have been adopted to interpret and understand real world phenomena, a necessary step of our investigation is identifying the various degrees of instrument typologies' empirical applications.

As explained in Figure 2, these applications have to be interpreted as going through a funnel-like process, from the level of acting as a mere reference (as in a literature review) to the level of acting as a complete "on the ground" empirical operationalization.

To exemplify the four different categories of typology applications, as an example, we adopt the famous *stick, carrots and sermon* typology proposed by Vedung (1998). Indeed, every instrument classification can be thought as made of three embedded components:

- instrument typology (e.g., Vedung, 1998);
- instrument family (e.g., regulatory, economic and voluntary instruments)

---

[5] The following cases were interpreted as non directly empirical analysis, therefore dropped out from our final sample: introductory article presenting the contents of a special issue with empirical contributions; articles quoting someone's else empirical work to back up their own statements (e.g. Rist R.C., Joyce M.K., 1995).
[6] We purposefully decided to include in our sample the publications from the authors of our reference classification, of course those fulfilling our selection criteria. Indeed, we believe that these contributions can represent useful advancements of different policy instrument typologies, while providing new instances of their empirical applications.

- instrument mode (for each individual instrument, e.g., tax deductions, grants, and loans).

By using these components, we identify four different categories for the application of typologies, as explained in the following.

Figure 2 Policy instruments' components
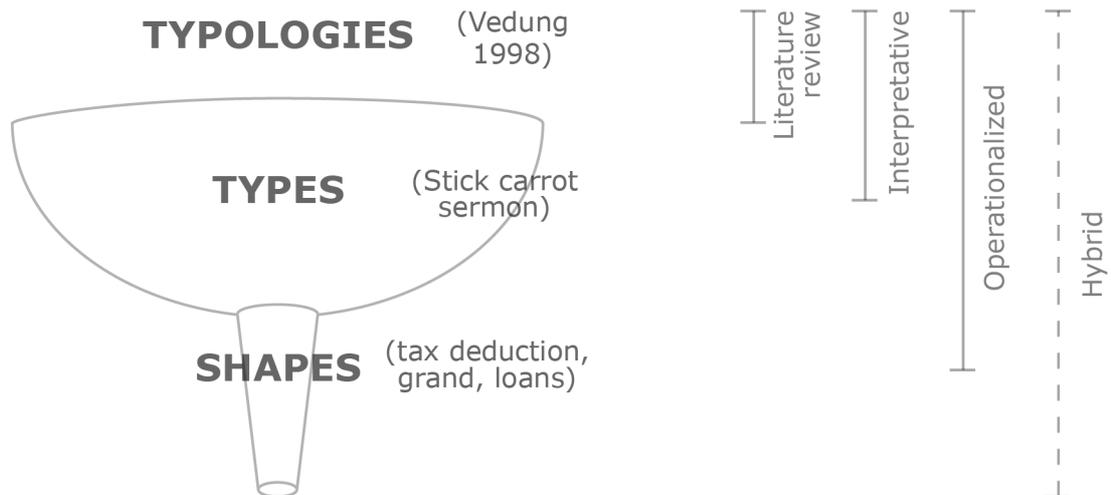
The literature review includes cases for which different policy instrument typologies (or just one typology) were used as a reference for a given study, which means that the referenced typology or source was quoted without narrowing down its contents but as a simple background theoretical reference.

The interpretation category includes all the cases where the types of policy instruments were used as an analytical and heuristic device for the narrative of a given empirical analysis, which means that, in the case of the Vedung (1998) typology, the different instrument families (e.g., regulatory, economic, and voluntary) were employed as a theoretical lens for interpreting real world phenomenon.

The operationalization dimension includes cases for which the entire theoretical abstraction was used to narrow the empirical focus of the analysis, at the level of each individual instrument's feature and component, and define the measurement of a phenomenon that was presented and applied.

Finally, in the category of hybrid typologies, we included all the policy instrument classifications that were inspired by at least one reference source that developed a new policy instrument typology.

Then, we analysed and classified each source of our sample (N=310) according to the theory driven reference category of policy instrument typology application. These categories were interpreted as being mutually exclusive and were used to construct a

dataset that can be analysed at the aggregate level. Similar to the classification procedure described above, we collected information on the number of direct quotations for each reference work.

As for the previous step of the analysis, to safeguard the reliability of our coding procedures while accounting for intercoder reliability, w the interpretations of the sources were discussed among the researchers on a regular basis.

Then, as further developed in the following paragraphs, we quantitatively elaborated on the information in this dataset to understand how different instrument typologies have been used in current studies, including the frequency of their applications and the possible co-occurrence of various theories.

4.   Findings

4.1. Quotation frequencies and distribution

Due to the empirical and theoretical heterogeneity of the policy instrument typologies, through a descriptive analysis of our final sample, we were able to extrapolate many interesting insights. These insights focus on both the effective adoption of policy instrument typologies for empirical analysis and on more general information regarding the frequency and type of their applications.

Figure 3 briefly summarizes the frequency of each category of application in our sample. The literature review is clearly the dominant pattern of instrument typology usage and includes 57,10% (N=177) of the total sample.

Figure 3 Typology frequencies
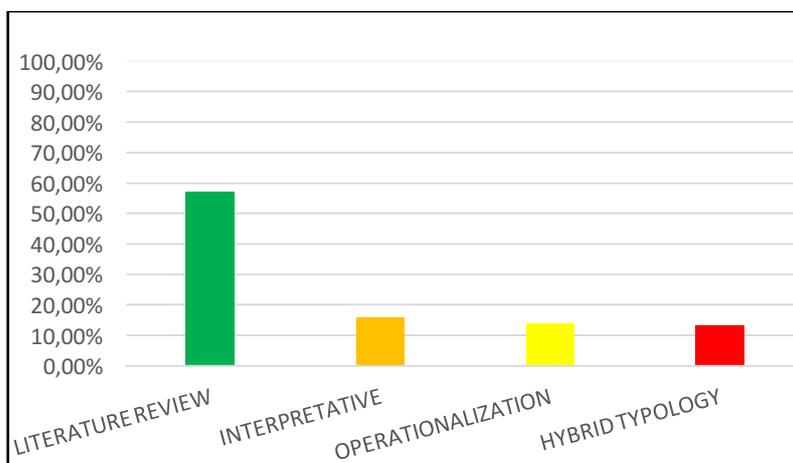
The second most represented category is Interpretation, accounting for 15,81% (N=49) of the sample, followed by an almost equal presence of Operationalization accounting for 13,87% (N=43) of the sample and Hybrid typology accounting for 13,23% (N=41) of the sample.

These aggregate descriptive statistics clearly depict how less than one third of our sample focuses on a real empirical application of one of the eight selected typologies.

In addition to the analysis of the frequencies of the application of instrument typologies, we are also interested in understanding the usage of different policy instrument typologies, that is, how our eight theoretical categories of references have been utilized. Therefore, it is also necessary to look at the distribution of the absolute number of quotations that each of our reference author scored in our sample. In contrast to the previous classification, in this case, the categories are not mutually exclusive, which means that each source can appear in more than one category (e.g., one or more reference authors can be quoted within the same article, even though just one of the reference typologies can be used as a guide for the empirical investigation). Nonetheless, Figure 4 is meaningful to the extent that it can provide us with information regarding trends related to the references for different typologies.

Figure 4 Absolute quotation
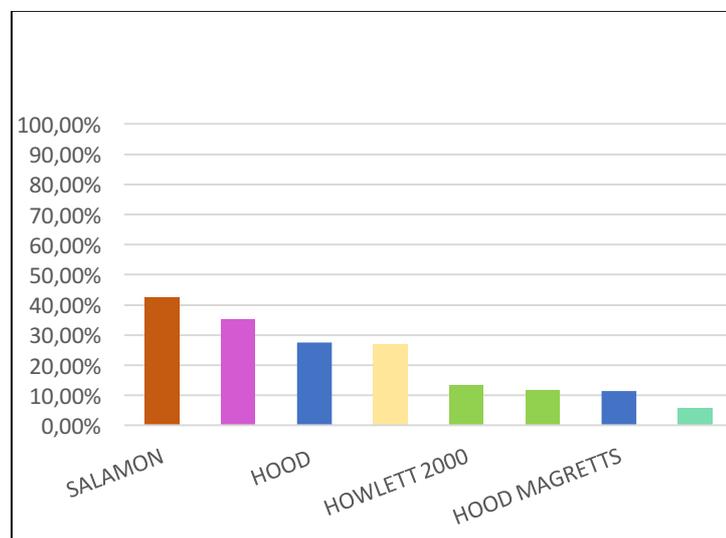
Salamon is the most quoted author in our sample with a total of 42,58% (N=132), followed by Vedung at 35,16% (N=109), Hood (27,42%; N=85) and Schneider Ingram (27,10%; N=84), which score a similar level of citations. On the right side of the chart, is the group of authors with the lowest number of citations, scoring fairly similar

percentages, namely, Howlett_2000 (13,23%; N=41), Howlett_2011 (11,61%; N=36), and Hood_Margetts (11,29%; N=35). Finally, the least quoted source is Doern and Phidd, with a total of N=18 citations (5,81%).

Given the limitations of the data collection procedures, more information is needed regarding the different patterns of instrument typology application frequencies in the literature review regarding categories of policy instruments. Due the high number of authors cited in the literature review (N=177), we decided that the first step for investigating the characteristics of this typology is investigating the co-occurrence of different citation patterns.

First, an exploratory analysis was conducted to disentangle the co-occurrence of different quotation typologies, and the information is provided in Table 2, which provides information regarding the frequency of the combination of article aggregate references.

Indeed, the column "article cited" refers to the number of articles quoted in the same paper, whereas the column "article citing" refers to the number of articles adopting a given citation pattern. Therefore, within our sample, the majority of articles (N=181, 58,39%) tend to refer to just one source; N=71 (22,9%) articles jointly cite two of our reference sources, and N=33 (10,65%) articles refer to three of our reference authors.

TABLE 2 Citation combinations

ARTICLES CITED	ARTICLES CITING	% ARTICLES CITING
1	181	58,39%
2	71	22,90%
3	33	10,65%
4	14	4,52%
5	5	1,61%
6	5	1,61%
7	1	0,32%
total	310	100,00%

The number of articles in the column "article citing" decrease with an increase in the number of articles cited. Therefore, any of our sources refer to all of our eight reference sources, and just one (0.32%) refers to seven reference sources. Given the descriptive nature of our analysis, we cannot infer anything regarding the likelihood of certain combination patterns, even if we are able to provide some useful information concerning the combination of the usage of certain instrument typologies[7].

---

[7] In the forthcoming version of this study, we investigate the co-occurrence of different combinations of our reference authors typologies to understand whether it is possible to highlight some common typology reference patterns within our sample

4.2. Instrument typology application patterns

Now that some of the general application typology usages and citation patterns have been described, it is interesting to look at the distribution of our reference authors along the various application categories, which means to analyse the extent to which different policy instrument typologies have been adopted as a theoretical lens to develop empirical analysis.

At this point, a methodological caveat is needed. Indeed, regarding the "on the ground" instrument typology applications (e.g., operationalization and interpretative), we classify the data on the basis of the different authors' typology reference. We are able to identify the presence of a unique instrument typology and the extent of its operationalization. We treat the dimensions of the literature reviews and hybrid typologies as dichotomous variables (meaning present-absent) because we were not able to connect them to the adoption of a specific author typology[8]. Therefore, since we have already provided information on the frequency distribution of the different typologies (see figure 3 above), we now focus our attention on how differently our reference authors' typologies have been empirically used in the interpretation and operationalization categories. This distinction is shown in Table 3.

Table 3   On the ground applications

	VEDUNG	SALAMON	SCHNEIDER INGRAM	HOOD	HOWLETT 2000	HOOD MAGRETTS	HOWLETT 2011	HOWLETT 2000-2011	DOERN PHIDD
OPERATIONALIZATION	19 (55,88%)	6 (31,58%)	9 (60%)	5 (62,5%)	1 (16,67%)	0	2 (66,67%)	1 (33,33%)	0
INTERPRETATIVE	15 (44,12%)	13 (68,42%)	6 (40%)	3 (37,5%)	5 (83,33%)	4 (100%)	1 (33,33%)	2 (66,67%)	0
TOTAL	34	19	15	8	6	4	3	3	0

In absolute terms, Vedung's typology is the most applied typology with a total of N=34 applications. A slight majority of his instrument typologies have been adopted for on the "on the ground" empirical applications (55,88%), whereas the remaining 44,12% have been adopted through an interpretative lens. On the right side of the table, we find Salamon, whose typologies have mainly been adopted in the interpretation category (68,42%) and Schneider and Ingram, who, differently, have mainly been adopted in the operationalization category (60%).

At the aggregate level, Hood has mainly been adopted in the operationalization category (62,5%), and Howlett_2000 has mainly been adopted in the interpretation

---

[8] This choice was related to the fact that in both cases (literature review and hybrid typologies), reference to multiple authors' typologies were present. Therefore, due to the impossibility to connect the application typology to only one author we decided to limit our analysis to the usage of a certain typology of policy instrument application.

category (88,33%). It is worth nothing that neither Hood and Margetts nor Doern and Phidd have been fully operationalized in our sample; both studies score 0 in both categories. Finally, Howlett, 2011 and Howlett 2000_2011[9] are mostly used for operationalization applications and mostly used for interpretation applications, respectively.

Notably, at the aggregate level, the two typologies proposed by Howlett, (Howlet_2000 and Howlett_2011) scored a medium number of applications, which places them almost in the middle of the table.

Next, we decided to investigate the analytical content of this restricted sample (operationalization and interpretation applications) to increase the accuracy of the information on the features of the policy instrument application examples.

To this end, we classified our sub sample (N=92) according to four analytical focuses: performance (the paper assesses the policy effect of the adopted instruments); pattern of choice (the paper analyses the determinants of the choice of instruments of the policy makers); policy dynamics (the paper analyses the longitudinal development of the policy process, the different stages, and the role of policy actors and their interactions); and the content of the choices (the paper focuses on the types of policy instruments adopted and their characteristics). Table 4 shows the distribution of the 92 papers according these categories.

Table 4   The analytical focus

	Performance	Patterns of Choice	Policy dynamics	Content of Choices	*Total*
OPERATIONALIZATION	20	7	8	8	*43*
INTERPRETATIVE	11	7	19	12	*49*
Total	*31*	*14*	*27*	*20*	*92*

First, the Phidd and Doern classification is not present and thus it has not been adopted by any of the 92 papers, which clearly mirrors the results shown in Table 3. The results indicate that almost the half of the operationalization papers have been devoted to assessing the performance of the adopted policy instruments, while the interpretative

---

[9] Since in some cases both Howlett, 2000 and Howlett 2011 typologies were used together, we decided to add another category which can account for the combination of both typologies.

category includes papers on policy dynamics. Overall, the papers focused on performance and policy dynamics include approximately two-thirds of the sample.

To better understand the data in Table 5, the distribution of the frequency of the analytical topics among the eight typologies is presented.

Table 5 Distribution of the analytical focus *(in brackets the interpretive applications)*

	VEDUNG	SALAMON	SCHNEIDER INGRAM	HOOD	HOOD MAGRETTS	HOWLETT 2000	HOWLETT 2011	HOWLETT 2000-2011	TOTAL
Performance	16 (4)	5 (3)	6 (2)	-	1 (1)	2 (1)	1	-	31 (11)
Patterns of Choice	5 (2)	3 (2)	2 (1)	2	-	2 (2)	-	1 (1)	15 (8)
Policy Dynamics	10 (8)	3 (2)	5 (3)	5 (2)	1 (1)	2 (2)	-	-	26 (18)
Content of choice	3 (1)	8 (6)	2 (1)	1 (1)	2 (2)	-	2 (1)	2 (1)	20 (12)
TOTAL	34 (15)	19 (3)	15 (5)	8 (3)	4 (4)	6 (5)	3 (1)	3 (1)	92 (49)

Here, some patterns are quite clear. Vedung's classification is the most applied when the focus of the paper is on performance and represents 51,61% of the sample. Along the same vein, for papers focusing on policy dynamics, Vedung is clearly the most applied typology with N=10 cases (representing 38,46% of the sample) and the most applied typology for the pattern of choice category. The first two variations of the NATO typology (Hood and Hood_Margetts) are among the least adopted typologies when performance is the analytical core of the papers, and this result does not vary when Howlett's variations are considered. The two original variations of the Hood typology, as well as Howlett's taxonomies, are most adopted when the papers focus on policy dynamics. In contrast, the typology proposed by Salamon is the forerunner when the focus of the papers is on the instrument's choice, while it scores an average number of applications for the other 3 categories.

Finally, to understand the heterogeneity of our sample in terms of the content of the empirical application, we decided to investigate the major policy fields in which the different applications were considered.

Table 6 provides a preliminary frequency distribution and the most represented families of policy fields.

Table 6 The policy field distribution

	Environmental Policy	Education	Energy	Health	Social	Urban/Housing	Others	*TOTAL*
OPERATIONALIZATION	23	4	5	2	2	3	4	**43**
INTERPRETATIVE	12	3	1	4	5	3	21	**49**
TOTAL	35	7	6	6	7	6	25	92

The environmental field includes the lion's share of the papers in the sample (note that 109 of the 310 papers in the sample are environmental studies); 35,16% our total sample is focused on environmental issues (from climate change to pollution control), while two-thirds of all the papers are devoted to operationalization (65,71%). On the other hand, "other" studies (including paper on such disparate issues as alcohol and tobacco control, local partnerships, participatory democracy, e-government, third sector development, sports policy, donors in Africa, globalization, working environments, local government and development) account for a considerable percentage of the interpretive papers. The distribution of the remaining policy fields is almost equally shared among the last categories.

5. Discussion

The selection process used for our meta-analysis is depicted in a flow diagram (Figure 2) and has already provided major empirical results, namely: policy instruments are an emerging field of analysis, and their classification and typology, despite being widely cited, have seen limited direct empirical applications. Therefore, according to data collected from our sample, policy instrument typologies are mainly used for literature reviews, meaning they are used as a theoretical reference, which is often "ceremonial", rather than as the main framework for analysis. Policy instruments have become a common term in public policy, and this term is used even when they are not the real focus of the analysis. Very often, studies on governance, as well as those on its formulation and implementation, refer to or cite policy instruments as governance arrangements. That is, the number of simple citations (literature review category, N=177) does not have to be considered an anomaly.

Once this unexpected result has been confirmed by our empirical evidence, other less predictable insights should be discussed.

First, three typologies are among the most cited in terms of direct quotations, and at the same time, these are the most adopted when the sample is restricted to the "on the ground" empirical application categories (interpretation and operationalization): the Salamon, Vedung and Schneider and Ingram typologies.

Furthermore, although the original version of the NATO typology is ranked third in terms of direct citations, its empirical applications do not reflect this pattern, especially when the analytical focus is on performance (N=0). Indeed, it is the opposite for the typology proposed by Schneider and Ingram, which is ranked fourth in terms of direct quotations, third in terms of the absolute number of applications (Table 3) and second in terms of papers that focus on performance.

On the other hand, it is worth noting that the application of the remaining five typologies is rare, and the classification proposed by Doern and Phidd is totally absent. One possible explanation could be that given that coercion is the main criteria for policy instrument classification, this classification has been embraced by Vedung (which was published at a later date).

We believe that it is possible to identify the prevalent use of the most popular three classifications (Vedung-Salamon-Schneider and Ingram) by comparing them to the typologies inspired by the NATO model (the original version proposed by Hood and the following adaptations proposed by Howlett). Here, some arguments could be raised. All three typologies, in a relatively simplified way, cover the field of policy instruments and make it easier to attribute an actual tool in an exclusive way to one category or another. Furthermore, these three typologies are based on classifying criteria that are easier to operationalize when the typologies are to be put into practise; the degree of coercion as well as behavioural motivations are common conceptual tools used by policy scholars, while the four criteria proposed by Salamon leave room for greater theoretical flexibility.

Moreover, when looking at the categories proposed by the NATO model, "organization" does not represent a unique dimension, meaning it gives room for different interpretations. Indeed, empirical devices such as the establishment of agencies, record-keeping or governmental reorganization could also be classified as specific types of regulation. Thus, it could be argued that the operationalization of the classification of policy instruments proposed by Vedung, Salamon and Schneider and Ingram are simpler. Most of the empirical applications of the NATO variations are either in the field of digital policy (Ossebaard et al 2012; Broeders and Hampshire 2013), where specific governance configurations are addressed (Vabo and Roseland 2012; Macintosh et al 2015; Kohoutek 2016) or the design of participatory policy-making is analysed (Bherer and Breux 2012). At the same time, the NATO variants are rarely adopted for analyses conducted in fields such as environment, education, health and social policy.

However, it should be noted that often, the most applied three classifications are empirically adopted in a loose manner, which means that scholars often present the typologies and use their labels simply as a bottle to be filled, without any significant connection to the theoretical assumptions on which the typology is built upon. This is especially true for the classification proposed by Salamon (none of the analysed empirical papers refers to the list of elements that characterize a tool according Salamon: the delivery vehicle, the delivery system, and a set of rules that regulates the entities included in the delivery system). In addition, in the case of the Vedung classification, the theoretical basis of the conceptual treatment (the degree of coercion) is often ignored. Thus, what emerges is "labellism", meaning that these typologies have not been theoretically and empirically used.

Obviously, this is the other side of the range of "freedom" that the three most adopted typologies offer, and one could say that what matters is that the "list" of the policy instruments adopted for the interpretation and or the operationalization is good enough to propose an adequate understanding or coherent explanation of the phenomenon. At the same time, the disconnect from the use of the typological categories and their theoretical background is a constraint to the accumulation of scientific knowledge and to the construction of shared theoretical frameworks and empirical guidelines.

The second significant pattern emerging from the meta-review is that the references to policy instruments are consistently adopted when environmental issues are analysed. This tendency emerged not only in the analysis of our total sample (N=310) but also in the analysis of the sub-sample for on-the-ground application (N=92). This result was not unexpected, but the size of the phenomenon is nevertheless remarkable. It could be argued that this result could be related with both the large number of scholars studying environmental matters and the massive adoption that has occurred over the decades since the policy instrument approach first appeared in this policy field. Due to the urgency of environmental issues, scholars have been pushed to assess the effects of environmental policies, and this has prompted the analytical focus on instruments and how they work (especially their performance). Furthermore, it has been noted that (as shown in Table 5) most of the papers focused on operationalization belong to socially relevant policy fields (not only the environment but also education, energy, health and social policy), while many of the interpretive papers focused on a large variety of different topics and specific policy issues. Therefore, the political relevance that certain policy issues have in the public sphere might be a possible indicator for the patterns of application among the different policy fields.

Finally, as demonstrated by the heterogeneity of our results, this study confirms the polyhedric nature of policy instruments and the fact that they can be a focus of analysis from different perspectives. As demonstrated in Table 4, there is a proportionate

distribution between performance, policy dynamics, pattern of choice and content of choice. This result confirms that policy instruments represent a very promising topic for analysing the different aspects of public policy.

6.   Conclusion

We applied the PRISMA methodology for a meta-analyses to review a large body of literature and provide an exploratory and descriptive overview of current policy instrument typologies.

As expected (Askie and Offringa, 2015), the the combines use of a systematic analysis and a meta-analysis allowed us to synthetize and then analyse the existing evidence on the effective application of policy instrument typologies and their contribution to explaining governing actions. We selected eight theoretical reference typologies on the basis of their capacity to represent the most general and inclusive conceptual treatments according to four criteria (coercion, resources, behavioural motivations and multidimensionality).

By following the precepts of the PRISMA method, we extracted 310 empirical papers that have been categorized on the basis of four main applications of the typologies (literature review, hybridity, interpretation and operationalization). The most relevant evidence shows that the typologies proposed by Vedung, Salamon and Schneider and Ingram are the most adopted for empirical analysis, and above all, the Vedung classification can be considered the most attractive for empirical analysis, while the NATO variations are less adopted and mostly used for interpretation applications.

Despite these interesting results, we believe that a more fine-grained analysis is necessary, both quantitatively and qualitatively.

Indeed, a more accurate analysis of the different patterns of co-occurrence of the different policy instrument typologies is need. This analysis would provide more data on the theoretical backgrounds on which scholars design their usage of policy instrument typologies. On the other hand, from the qualitative perspective, it is necessary to develop a more fine-grained codification of the empirical application of the typologies to better understand whether and how a cross fertilization of the policy instrument approach is possible among policy fields as well as within the same policy field.

References

Askie, L.,Offringa, M. (2015) Systematic review and meta-analysis. Seminars in Fetal & Neonatal Medice, (20): 403-409.

Bardach, E. (1979). *The lmplementation Game.* Cambridge: MIT Press.

Béland, D., Howlett, M. (2016). How solutions chase problems: Instrument constituencies in the policy process. *Governance,* 29(3): 393–409.

Bherer, L. and Breux, S. (2012) The Diversity of Public Participation Tools:Complementing or Competing With One Another? *Canadian Journal of Political Science*, 45(2), 379–403.

Borras S., Edquist C. (2013). The choice of innovation policy instruments. *Technological Forecasting & Social Change*, 80: 1513-1522.

Bressers, H. Klok, P.J. (1988) Fundamentals for a Theory of Policy Instruments, *International Journal of Social Economics*, Vol. 15 Issue: 3/4, pp.22-41.

Broeders, D. and Hampshire, J. (2013) Dreaming of Seamless Borders: ICTs and the Pre-Emptive Governance of Mobility in Europe. *Journal of Ethnic and Migration Studies,*39(8), 1201-1218.

Carey G., Crammond, B. (2015)What Works in joined-up government? An evidence synthesis. *International Journal of public administration*, 38:1020-1029.

Capano, G., Howlett, M. and Ramesh, M. (eds.) (2015) Varieties of Governance. London: Palgrave.

Capano, G., and A. Lippi. (2017) How Policy Instruments are Chosen: Patterns of Decision Makers' Choices. *Policy Sciences* 50 (2): 269–93.

Campbell, H.E., R.M. Johnson and E. Larson (2004). Prices, devices, people or rule its: The relative effectiveness of policy instruments in water conservation. *Review of Policy Research 21*: 637–662.

Edler J., Cunningham P., Gok A., Shapira P. (2016) *Handbook of innovation policy impact*. EU-SPRI Forum on Science, Technology and InnovationPolicy. Edwars Elgar Publishing.

Etzioni A (1961) *Comparative Analysis of Complex Organizations*. The Free Press, New York.

Falagas M. E., Pitsouni E. I., Malietzis G. A. and Pappas G. (2008) Comparison of PubMed, Scopus, Web of Science, and Google Scholar: Strengths and Weaknesses. *The FASEB Journal* 22(2): 338–342.

Faling M., Robbert B., Karlsson-Vinkhuyzen S., Termeer K. (2018) Policy entrepreneurship across boundaries: a systematic literature review. *Journal of Public Policy,* 1:30.

Flanagan, K., Uyarra, E., Laranja, M. (2011). Reconceptualising the "policy mix" for innovation. *Research Policy* (40): 702-713.

Hood, C. (2007), 'Intellectual obsolescence and intellectual makeovers: Reflections on the tools of government after two decades', *Governance* 20: 127–144.

Howlett, Michael. 2000. Managing the 'Hollow State': Procedural Policy Instruments and Modern Governance. *Canadian Public Administration* 43(4):412–431.

Howlett, M. (2011), *Designing Public Policies: Principles and Instruments*, London: Routledge.

Howlett, M. (2014). From the 'old' to the 'new' policy design: design thinking beyondmarkets and collaborative governance. *Policy Sciences,* 47(3), 187-207.

Howlett M and Rayner J (2013) Design Principles for Policy Mixes: Cohesion and Coherence in 'New Governance Arrangements'. *Policy and Society* 26(4): 1-18.

Howlett M and Rayner J (2017) Patching versus packaging in policy formulation: Assessing policy portfolio design. In: Howlett M and Mukherjee I (eds), *Handbook of policy formulation*. Cheltenham: Edward Elgar, pp. 112–127.

Ingram, H. and Schneider, A.I. (1990) The Behavioral Assumptions of Policy Tools. *The Journal of Politics*, 52(02), pp. 510–529.

Jordan, A. & Matt E. (2014), Designing policies that intentionally stick: policy feedback in a changing climate. *Policy Sciences* 47(3): 227.

Jordan, A., Wurzel, R., and Zito, A. (2010) Comparative Conclusions - 'New' Environmental Policy Instruments: An Evolution or a Revolution in Environmental Policy?, *Environmental Politics*, 12:1, 201-224,

Jordan, A., Wurzel, R., and Zito, A. (2005) The rise of 'new' policy instruments in comparative perspective. *Political Studies*, 53 (3), 477–496.

Kirschen, E. S., J. Benard, H. Besters, F. Blackaby, O. Eckstein, J. Faaland, F. Hartog, L. Morissens, and E. Tosco (1964). *Economic Policy in Our Time*. Chicago: Rand McNally.

Kohoutek, J. (2016) Deconstructing Institutionalisation of the European Standards for Quality Assurance: From Instrument Mixes to Quality Cultures and Implications for International Research. *Higher Education Quarterly*, 70(3), 301-326.

Lascoumes, P. and P. Le Galès (2004), *Gouverner par les instruments*, Paris: Presse de la Fondation Nationale des Sciences Politiques.

Lascoumes P., and P. Le Galès (2007), 'Understanding public policy through its instruments. From the nature of instruments to the sociology of public policy instrumentation', *Governance* 20(1): 1–21.

LeGalès (2011) Policy Instruments and Governance. In M. Bevir, *The Sage Handbook of Governance*. London: SAGE:

Linder, S.H. and B.G. Peters (1989), 'Instruments of government: Perceptions and contexts', *Journal of Public Policy* 9: 35–58.

Linder, S.H. and B.G. Peters (1998), 'The study of policy instruments: Four schools of thought', in G.B. Peters, F.K.M. van Nispen (eds), *Public Policy Instruments: Evaluating the Tools of Public Administration*, Cheltenham, UK: Edward Elgar, pp. 33–45.

Macintosh, A., A. Foerster, and McDonald, J. (2014). Policy design, spatial planning and climate change adaptation: a case study from Australia. *Journal of Environmental*

Planning and Management 58(8), 1432-1453.

May, P.J., B.D. Jones, B.E. Beem, E.A. Neff-Sharum and M.K. Poague (2005), 'Policy coherence and component driven policy making: Arctic policy in Canada and the United States', *Policy Studies Journal* 33: 37–63.

McDonnell, L. M. and Elmore, R.F. (1987) Getting the Job Done: Alternative Policy Instruments. *Educational Evaluation and Policy Analysis*, 9(2), 133−152.

Ossebaard, H.C. Seydel, E.R., van Gemert-Pijnen, J. (2012) Technology for transparency: The case of the web-based Dutch national health portal. *Policy & Internet*, 4(2), pp. 1-25, article n. 8.

Phidd, R. and Doern, G. B. (eds.) (1983) *Canadian Public Policy: Ideas, Structure, Process*. Toronto: Methuen.

Rogge, K., S., Reichardt, K. (2016) Policy mixes for sustainability transitions: An extended concept and framework analysis. *Research Policy*, 45, 1620-1635

Salamon, L.M. (2000) The New Governance and the Tools of Public Action: An Introduction. *Fordham Urban Law Journal*, 28(5), 1611-1674

Salamon, L.M. (2002), *The Tools of Government. A Guide to the New Governance*, Oxford: Oxford University Press.

Schneider, A.L. and H. Ingram (1997), *Policy Design for Democracy*, Lawrence, KS: University Press of Kansas.

Schmidt, T. and Sewerin, S. (2018) Measuring the temporal dynamics of policy mixes– An empirical analysis of renewable energy policy mixes' balance and design features in nine countries. *Research Policy*, available online 30 March.

Vaibo, S. I. and Roseland, A (2012) Conceptualizing the Tools of Government in Urban Network Governance. *International Journal of Public Administration*, 35(14), 934–946

van der Doelen F. (1998) The 'give-and-take' packaging of policy instruments: optimising legitimacy and effectiveness. In *Carrots, Sticks and Sermons: Policy Instruments and Their Evaluation*, Bemelmans-Videc M-L, Rist R, Vedung E (eds). Transaction: New Brunswick. 129–146.

van der Heijden J., Kuhlmann J. (2017) Studying incremental institutional changes: A systematic and critical meta-review of the literature from 2005 to 2015. *Policy Studies Journal* 45 (3):535-554.

Vedung, E. (1998) Policy Instruments: Typologies and Theories. In M.L. Bemelmans-Videc, R.C. Rist and E. Vedung (eds.), *Carrots, Sticks, and Sermons: Policy Instruments and Their Evaluation*. New Brunswick, NJ: Transaction, pp. 21–58.
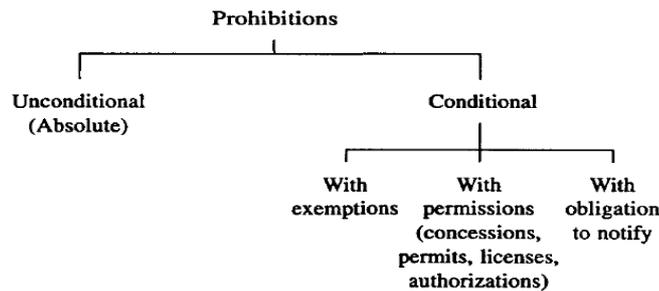
APPENDIX

Table A *Classification of Phidd and Doern (1983)*

Private behaviour	Exhortation	Expenditure	Regulation	Public ownership
Self-regulation	Speeches Conferences Information Advisory investigations Voluntary approaches	Grants Subsidies Transfers	Taxes Tariffs Rules Fines Imprisonment	Crown corporations Mixed corporations Purchase of assets
Minimum ——————————————— (degrees of legitimate coercion) ——————————— Maximum

Tables B *The typology of Vedung (1998)*

Regulation instruments: Prohibitions

```
                        Prohibitions
                             |
        ┌────────────────────┴──────────────────┐
  Unconditional                             Conditional
   (Absolute)                                    |
                              ┌─────────────────┼─────────────────┐
                            With              With              With
                          exemptions       permissions       obligation
                                           (concessions,      to notify
                                           permits, licenses,
                                           authorizations)
```

Economic and Information instruments

Economic means in cash:
Incentives (affirmative, promoting, encouraging):
  Cash transfers
  Cash grants
  Subsidies
  Reduced-interest loans
  Loan guarantees
  Tax expenditures (exemptions, write-offs, credits)
  Insurances of loans, crops, investments
Disincentives (negative, restraining, discouraging):
  Taxes
  Charges
  Fees
  Customs duties
  Tariffs

Economic means in kind:
Incentives:
  Government provision of goods and services
  Private provision of goods and services under government contracts
  Vouchers

Mediated transmission:
Television, radio, film
Newspapers
Printed matter (books, brochures, booklets, leaflets, folders)
Labels
Posters

Interpersonal transmission:
Direct, personal advice
Classroom or on-site education
Workshops
Conferences
Demonstrations
Government example
Exhibitions
Investigation and publicity

TABLES C   *NATO variants*

Table C1 The Hood NATO typology (1983)

Principle Use		**Nodality**	**Governing Resource** **Authority**	**Treasure**	**Organization**
Principle Use	**Detectors**	Surveys	Licencing	Policing	Record-Keeping
	Effectors	Public Information Campaign	Regulation	Subsidies	Government Agencies

Tables C2 Typology of Hood and Margetts (1987)

Government effectors

	Nodal receivers	Rewards	Requisitions	Ergonomic detectors
Passive (government at a fixed point or not taking initiative)	Unsolicited tenders (unconditional)	Unsolicited propositions	Obligations to display	Turnstiles
	Ear trumpet	Advertised rewards	Obligations to notify	Fixed scanners
		Applications (information as a by-product)	Returns	
	Scrutiny of free media (active search within government offices)	Information exchange (informants pool information with government for mutual benefit	Interrogation (active search, but informant required to attend on government)	Mobile scanners
Active (government operating away from home or taking initiative)	Direct inquiry (government waits on informant)	Active propositions (made by government to prospective informant)	Inspections	Hidden scanners

Government detectors

	Nodal receivers	Rewards	Requisitions	Ergonomic detectors
Passive (government at a fixed point or not taking initiative)	Unsolicited tenders (unconditional)	Unsolicited propositions	Obligations to display	Turnstiles
	Ear trumpet	Advertised rewards	Obligations to notify	Fixed scanners
		Applications (information as a by-product)	Returns	
	Scrutiny of free media (active search within government offices)	Information exchange (informants pool information with government for mutual benefit	Interrogation (active search, but informant required to attend on government)	Mobile scanners
Active (government operating away from home or taking initiative)	Direct inquiry (government waits on informant)	Active propositions (made by government to prospective informant)	Inspections	Hidden scanners

Tables D *The Typologies of Howlett*

D1. Resources-based procedural tools (Howlett 2000)

| | | Principal governing resource used | | |
	Nodality	Authority	Treasure	Organization
Positive	Education Information- provision Focus groups	Labelling Treaties and political agreements Advisory group creation	Interest- group creation Intervenor and research funding	Institutional reform Judicial review Conferences
General purpose of instrument use				
Negative	Propaganda Information suppression Denial of access	Banning groups and associations	Eliminating funding	Administrative delay and obfuscation

Positive and *Negative* labels are under "General purpose of instrument use".

D.2 Substantial and procedural resource-based typology (Howlett 2011)

		Information/ Credibility	Governing Resource Authority/ Legitimacy	Treasure/ Financial Need	Organization/ Competence
Purpose of Tool	**Substantive**	Public Information Campaign	Independent Regulatory Agencies	Subsidies and Grants	Public Enterprises
	Procedural	Official Secrets Acts	Administrative Advisory Committees	Interest Group funding	Government Re-organizations

Table E *The Typology of Schneider and Ingram (1990; 1997)*

Type of policy instruments	Definition	Elements
Authority Tools	Statements backed by the legitimate authority of government that grant permission, prohibit, or require action under designated circumstances.	• Requires coercion • Creates Uniformity, reduced variation • Tension between initiators and targets
Incentives Tools	Incentive tools assume individuals are utility maximizers and will not be positively motivated to take policy-relevant action unless they are influenced, encour-aged, or coerced by manipulation of money, liberty, life, or other tangible payoffs.	*Rewards* – Provide reinforcement for compliance *Sanctions* – Provide punishment for non-compliance
Capacity Building Tools	Capacity tools provide information, training, education, and resources to enable individuals, groups, or agencies to make decisions or carry out activi-ties	*Training* – Improving human capital for an organization *Capital Grants* – Money allocated for materials which improve service *Preservation* – Retain historical and environmental landmarks for future study
Symbolic and Horlatory Tools	Symbolic and hortatory tools assume that people are motivated from within and decide whether or not to take policy-related actions on the basis of their beliefs and values.	Short term benefit to individual or agency, long term benefit to society •Short term costs may produce long-term benefits
Learning tools	Learning tools are used when the basis upon which target populations might be moved to take problem-solving action is unknown *or* uncertain. Policy tools that pro-mote learning provide far wide discretion by lower-level agents or even the target groups themselves, who are then able to experiment with different policy approaches.	*Research* - Exploring unanswered questions *Fact-Finding* – Gathering and condensing information

Table F *Salamon's classification of policy instruments based on degree of coerciveness (2000)*

Degree of Coerciveness	Illustrative Tools	Likely Impacts				
		Effectiveness	Efficiency	Equity	Manageability	Legitimacy/ Political Support
Low	Tort liability Information Tax expenditures	Low	Moderate	Low	Moderate	High
Medium	Vouchers Insurance Grants-in-aid Government corporations Loan guarantees Direct loans Contracting Labeling requirements Corrective Fees & charges	Moderate	High	Moderate	Moderate	Moderate
High	Economic regulation Social regulation	High	High/Low	High	Low	High/Low

Table G Web database retrieval process

(For all the composite references - meaning, situations in which the paper has two authors, different combination of title quotations - the research query with the highest number of result has been selected)

Hood 1983	
SCOPUS	
Tot.	288
Language	275
Document type	**240**
ISI	
Tot.	154
Language	148
Document type	**121**

Hood _ Margetts 2007	
SCOPUS	
Tot.	180
Language	176
Document type	155
ISI	
Tot.	100
Language	94
Document type	83

Ingram _Schneider 1990	
SCOPUS	
Tot.	286
Language	281
Document type	251
ISI	
Tot.	194
Language	194
Document type	170

Howlett_ 2000	
SCOPUS	
Tot.	180
Language	105
Document type	98
ISI	
Tot.	67
Language	67
Document type	62

Howlett_2011	
SCOPUS	
Tot.	91
Language	86
Document type	77
ISI	
Tot.	123
Language	116
Document type	104

Salamon_2002	
SCOPUS	
Tot.	682
Language	656
Document type	558
ISI	
Tot.	33
Language	32
Document type	25