The Parameters of Policy Portfolios: Verticality and Horizontality in Design Spaces and Their Consequences for Policy Mix Formulation

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Abstract

Policies increasingly come in complex packages and understanding the nature of design criteria for such portfolios is increasingly important. However existing studies of policy mixes fail to carefully define the dependent variable of the inquiry. As a result theorization of policy design has lagged, the cumulative impact of empirical studies has not been great and understanding of the phenomena, despite many observations of its significance in policy studies, has not improved significantly over the past three decades. This paper aims to revitalize this important aspect of policy design work and policy studies by distinguishing between mix types and their impact on policy formulation. It defines key types and sub-types of mixes based on the complexity of design variables such as the number of goals, the number of policies and the number of levels of government and sector involved in the design of a policy bundle. The taxonomy is then used to assess the validity and applicability of oft-cited but under-theorized and under-examined portfolio design principles and precepts.

Introduction: Tool Mixes and Policy Design Studies

Policy tools, or the instruments or techniques used by government in order to implement policy goals (Howlett 2005), have a special place in considerations and studies of policy design. This is because this approach is based on the preparation of plans for tool use with a reasonable chance of achieving a specific goal or target (Howlett 2004). Choosing policy tools becomes more complex when multiple goals and multiple policies are involved within the same sector and government, as is very common in many policy-making situations (Doremus 2003; Jordan et al 2012; Howlett et al 2009).

These latter kinds of multi-policy, multi-goal and multi-instrument mixes – what Milkman (2012) calls 'policy bundles', Chapman (2003) and Hennicke (2004) a 'policy mix' and Givoni et al (2012) 'policy packages' – are examples of complex portfolios of tools. These mixes typically involve much more than functional logics linking tools to a goal but also deal with ideological or even "aesthetic" preferences in tool choices and goal articulation which involve trade-offs and bargaining between actors in choosing one

set of tools, goals and policies over another (Beland and Wadden 2012; Williams and Balaz 1999;). This makes their formulation or design especially problematic (Peters 2005; Givoni 2013; Givoni et al 2012). Most often the focus should move from the design of specific instruments to the appropriate design of instrument mixes. This is more difficult to do when instruments belong to different territorial/administrative levels.

Key design questions about such portfolios with which contemporary scholars and practitioners grapple include the issues of avoiding both 'over' and 'under' design (Haynes and Li 1993; Maor 2012); how to achieve 'complementarity' and avoid 'redundancy' or counter-productive mixes (Grabosky 1995; Hou and Brewer 2010; Justen et al 2013a), how to enhance or alter mixes over time so that they are able to continue to meet old goals and take on new ones (van der Heijden 2011; Kay 2007); and how to sequence or phase in instruments over time (Taeihagh et al 2013).

In what follows below several distinctions are drawn between mix types based on the complexity of design variables including the number of instruments, the number of policy goals, the number of sectors and the levels of government and sectors involved in the construction and maintenance of a portfolio. It is argued that if policy design theory is to improve and better inform policy practice, then it requires better understanding the dimensions of these design spaces and the kinds of formulation processes which they encounter (Howlett 2011).

Problems with Existing Portfolio Analyses

Although thinking about the design of policy portfolios has been at the forefront of much current research work on policy design (Howlett 2005; Howlett 2011; Howlett and Lejano 2012), existing studies of such bundles of tools do not use consistent

terminology and fail to define the dependent variable carefully enough (Howlett, Kim and Weaver 2006). As a result, the cumulative impact of empirical studies has not been great, theorization has lagged, and understanding of the mix phenomena, despite many observations of its significance, has not improved very much over past decades (Chapman 2003; Ring and Schroter-Schlaack 2010).

Most older literature on policy tools focused on single instrument choices and designs (Tupper and Doern 1981, Salamon 1989, Trebilcock and Prichard 1983) and these studies provide only limited insights into the complex arrangements of multiple policy instruments which are commonly found in all policy fields (Jordan et al 2011 and 2012; Givoni 2013). Many significant issues related to the manner in which tool choices in bundles are made and how tool bundles evolve over time affect the propensity for designs to avoid the twin shoals of over and under-reacting to problems (Maor 2012; Howlett and Rayner 2007) while incorporating better knowledge of both synergistic and counter-productive tool relationships and interactions (Del Rio 2010; LePlay and Thoyer 2011; Grabosky 1995; Justen et al 2013b).

First there are a series of questions about how exactly tools fit together, or should fit together, into a mix. In such mixes the instruments are not isolated from each other and tools in such mixes interact leading to the potential for negative conflicts ("one plus one is less than two") and synergies ("one plus one is more than two") (Lecuyer and Bibas 2011; Philibert 2011). In such cases different design principles are required to help inform portfolio structure. Here the question of tool complementarity looms large. As Tinbergen (1952) noted, additional tools – "supplementary" or 'complementary" ones – are often required to control side-effects or otherwise bolster the use of a 'primary' tool.

Bundling or mixing policy tools together in complex arrangements, however, raises many difficult questions for students and practitioners when there are significant interactive effects among policy tools (Boonekamp 2006; Yi and Feiock 2012), some of which may be very difficult to anticipate or quantify using standard analytical tools (Justen et al 2013a and 2013b).

A second and related set of issues involves determining how many tools are required for the efficient attainment of a goal or goals. This concern has animated policy design studies from their outset and an example of an oft-cited rule in this area originating in very early years of policy design studies is that the optimal ratio of the number of tools to targets or goals in any portfolio is 1:1 (Knudson 2009).

This is a rule-of-thumb design principle towards which Tinbergen (1952) provided some logical justification in his discussion of the information and administrative costs associated with the use of redundant tools in the area of economic policy.[1] Most observers, however, dispute that such a simple situation was ever 'normal' and instead argue that combinations of tools are typically found in efforts to address multiple policy goals (Jordan et al 2012).[2] The issue of potentially under or over-designing a mix arises in all such circumstances and is made more complex because in some instances, for example, arrangements may be unnecessarily duplicative while in others some redundancy may be advantageous in ensuring that goals will be met (Braathen and Croci 2005; Braathen 2007).

A third set of concerns relates to how any optimum figure can be attained in practice. This concern is less a spatial than a temporal one as the existing evidence shows that suboptimal situations are very common in many existing mixes which have

developed haphazardly through processes of policy layering (Thelen 2004; van der Heijden 2011). This is a process in which new tools and objectives have been piled on top of older ones, creating a palimpsest-like mixture of quite possibly inconsistent and somewhat incoherent policy elements (Howlett and Rayner 2007; Carter 2012). These processes and change dynamics focus attention on the sequencing of instrument choices (Taeihagh et al 2009 and 2013b) and especially upon the fact that many existing mixes have developed without any sense of an overall conscious design. These kinds of 'unintentional' mixes can be contrasted with 'smarter' designs which involve creating new sets of tools specifically intended to overcome or avoid the problems associated with layering but which may be harder to put into practice (Gunningham et al 1998; Kiss et al 2012).

In other words, intelligent design of policy mixes begins with ensuring a good fit not only between packages of tools and government goals and their institutional and behavioural contexts at a specific moment in time (Considine 2012; Lejano and Shankar 2013), but also across time periods as new instruments appear and old ones evolve or are eliminated.[3] That is, design analyses must extend beyond questions of tool synergies and optimal design to consideration of how and why mixes change over time and how the processes of policy formulation followed in adopting such complex designs take place (Larsen et al 2006; Kay 2007; Feindt and Flynn 2009).

Better Defining the Design Space: Vertical and Horizontal Levels of Complexity in Policy Portfolios

Most work on the subject of policy portfolio design fails to define the design space carefully enough to be able to distinguish the impact on different design choices of

the spatial and temporal factors influencing the portfolio design process. Most studies, for example, fail to differentiate between simple and complex contexts and simple and complex designs and mixes (Howlett 2004; Howlett et al 2006). But, as the discussion of the Tinbergen Rule above illustrated, incorporating the level of complexity of a mix is an important characteristic of the problem context which principles of portfolio design must take into account. Providing a better model of policy design spaces helps reveal some important variations in terms of who makes or is capable of making design decisions, as well as upon the likely content of that decision in specific contexts (Howlett 2011).

In addressing the issue of design spaces and their impact on policy designs and designing a first-order distinction must be drawn between single 'level' mixes and those with a more complex structure. That is, in addition to the 'horizontal' issue addressed by many students of policy mixes – pertaining to the kind of relationships existing between tools, goals and policies within a single level of government and sector of policy-making – a second, 'vertical' dimension is present and often ignored in these studies. This vertical dimension involves not just the number of instruments, goals and policies found in a mix, but also the number of policy sectors they involve and the number of governments active in policy formulation in this area (del Rio 2009).

Such a framework allows room for many more complex interactions between bundle elements than typically envisioned or analyzed in existing studies. That is, conflicts and synergies between tools, goals and policies can be identified both at the horizontal level, for example between different types of instruments and goals within each level of analysis, and/or at the vertical, that is, across and between different policy sectors and/or administrative levels. These variations have significant implications for

both the number and type of actors involved in policy design and the processes through which formulation unfolds, as well as for the complexity of design itself. While some aspects of horizontal interactions can be addressed in largely technical ways – so that, for example, some conflicts can be mitigated just by selecting certain instruments over others – in more complex cases such analyses must be supplemented by other political, administrative and organizational logics and policy formulation processes become more difficult. These challenges are multiplied as mixes evolve over time.

That is, vertical design contexts cutting across sectors and governments require efforts aimed at achieving administrative coordination and policy integration suitable to the complexity of context which horizontal mixes generally do not. In the former situation relevant coordination, for example, needs to be in place between different administrative levels and across policy subsystems which do are not needed in simpler horizontal contexts. The configuration of elements in a vertical mix must relate to preferences for different instruments favored in multiple sectors and governments rather than just among a single set of actors (Freeman 1985; Howlett 2009). And shifts in these preferences over time require changes to existing mixes which may be more or less easy to achieve and require special handling or developmental techniques and analysis.

Developing A Basic Taxonomy of Policy Mixes

Developing a typology of policy mixes based on the level of complexity of design spaces is a useful first step in advancing design studies beyond their current weak status. Mixes can be assessed at a general level by identifying spaces of conflicts, complementarities and synergies between policy fields, but those interactions also depend on the type of tools being adopted and the specific design elements of the instruments

adopted within those policy fields. The choice of specific instruments and design elements within interacting policy fields may contribute to mitigate conflicts and promote complementarities and synergies or not. Coordination is easier under certain instruments and design elements than under others.

The first key dimension in constructing such a taxonomy relates to distinguishing between mixes according to the number of instruments, goals and policies found within the horizontal level. Additional scenarios then exist for vertical mixes in situations in which multiple instruments and goals exist across sectors and governments. Like at the horizontal level, at these levels tools and goals may complement each other while in others or in some aspects they might not (Hull 2008; Flanagan et al 2011).

While relatively simple mix design processes may be dominated by expert actors (Dunlop 2009) and decided upon according to technical or functional criteria (Braathen 2007) moving towards multiple goals brings in additional actors such as those arrayed in 'epistemic communities' (Marier 2008) and involves more sophisticated evidence and ideas than is found in more simple contexts (Sanderson 2002). In such multi-level government and governance contexts (Hooghe and Marks 2003), different levels of government are likely to have some common, but also different goals and instrument preferences (Enderlein et al 2011) and reconciling them typically involves the use of the overt political calculus of intra- or intergovernmental bargaining and decision-making (Bolleyer and Borzel 2010; Kaiser 2012).

Increasing complexity from horizontality to verticality brings in cross-sectoral or cross-national epistemic actors (Haas 1992), including political ones, and often involves the assessment and use of politically-contested evidence and criteria (Gilabert and

Lawford-Smith 2012). The most sophisticated design spaces involve the most complex design processes and the full range of subsystem actors operating across multiple governance levels (McCool 1998; Hooghe and Marks 2003). Here, in a context of vested interests, lobbying pressures and intergovernmental jurisdictional disputes, fully-blown political criteria such as blame-avoidance, credit claiming, bargaining and log-rolling relevant information (Hood 2010) are features of policy formulation and designs take on new forms and patterns.

Taking these five aspects of horizontality and verticality into account, and assuming simple binary measures of complexity at each level, yields 32 possible configurations of portfolios.[4] This complexity can be greatly reduced, however by restricting analysis to only complex tool mixes; that is, eliminating from further analysis half the circumstances whereby only a single instrument is utilized. Combining both cross-sectoral and multi-governmental vertical elements into a single multi-level variable then reduces this to eight basic types (see Figure 1).

Figure 1 - Basic Typology of Portfolio Designs

				Types				
Dimension	I	II	III	IV	V	VI	VII	VIII
Multi-Level	No	No	No	No	Yes	Yes	Yes	Yes
Multi-Policy	No	No	Yes	Yes	No	No	Yes	Yes
Multi-Goal	No	Yes	No	Yes	No	Yes	No	Yes
	Simple Single-Level Instrument Mix	Complex Single-Level Instrument Mix	Simple Single-Level Policy Mix	Complex Single-Level Policy Mix	Simple Multi-Level Instrument Mix	Complex Multi-Level Instrument Mix	Simple Multi-Level Policy Mix	Complex Multi-Level Policy Mix

n this model, mixes can be seen to range from the simplest type when multiple tools are an issue (Type I) to the most complex multi-level, multi-policy, multi-goal type (Type

VIII). Four of these eight types, are '*instrument mixes*' which involve single policy contexts (Types I, II, V and VI) and therefore are less complex than their multi-policy counterparts (Types III, VII , and VIII) which can be termed "*policy mixes*".

Are all these eight types equally likely to occur? Although much of the literature seems to suggest that Type I situations are the norm, empirical studies suggest this is not the case (Howlett et al 2006; Hosseus and Pal 1997) and that more complex design spaces and hence policy portfolios are commonplace and growing. Factors such as the administrative and legislative arrangements present in federal and non-federal systems affect the likelihood of appearance of multi-governmental mixes (Howlett 1999; Bolleyer and Borzel 2010), while increasing efforts to promote collaborative or horizontal governance arrangements, for example, will affect the number of multi-sectoral and multi-policy situations which exist (Peters 1998; Koppenjan et al 2009).

Design Implications Flowing from this Taxonomy

This model of mix-types and design spaces helps overcome the three sets of issues raised above: how to avoid both 'over' and 'under' design; how to achieve 'complementarity' and avoid 'redundancy' or counter-productive mixes; and how to enhance or alter mixes over time so that they are able to continue to meet old goals and take on new ones. Each of these issues is discussed in turn below.

Avoiding Over and Under-Designing

Prima facie, the taxonomy set out in Table I shows that simple Tinbergen-type single instrument, single-goal, single policy, single government instrument mixes represents only one of many possible types of instrument mixes. And this means that the

standard Tinbergen design maxim of "one goal – one tool" proposed as a suitable design maxim to address the issue of instrument optimality is unlikely to be put into practice very often and other principles need to be developed to take its place within more complex designs if over and under-designing is to be avoided. These, to a certain extent, now have come to relate to the need to promote synergies and avoid counter-productive tools uses which previously was divorced from the optimality issue by the assumption of simpler design spaces and rules.

Avoiding Conflicts and Promoting Complementarities and Synergies in Tool Uses

When multiple tools are involved in a mix, the tools involved and invoked in a mix may be inherently contradictory (Tinbergen 1952; Grabosky 1995; Gunningham, Grabosky and Sinclair 1998) in the sense that they evoke contradictory responses from policy targets (Schneider and Ingram 1990a, 1990b; 1993; 1994; 1997; 2005), while other combinations may be more virtuous in providing a reinforcing or supplementing arrangement (Hou and Brewer 2010). Although a consensus does not exist on the terms and definitions of conflicts, complementarities and synergies (Oikonomou and Jepma 2008; Oikonomou et al 2010 and 2011), nevertheless it can be argued that the types of interaction found between tools will vary such that in some cases there will be:

(1) a strong conflict: where the addition of an instrument (X) leads to a reduction of the effect of a second instrument (Y) in the combination: $0 < X+Y < 1$;

(2) a weak conflict (partial complementarity) where the addition of an instrument to another leads to a positive effect on the combination, but lower than the one that would take place if both were used separately: $1 < X+Y < 2$;

(3) a situation of full complementarity where X adds fully to the effect of Y in the combination: X+Y = 2 and

(4) a situation of synergy where adding X to Y magnifies the impact of the combination: X+Y > 2 (del Río 2013). Effective design would involve avoiding strong conflicts, minimizing weak ones, and promoting complementarity and synergies. [5]

Here the idea would be to attempt to avoid conflicts of both types while promoting tool combinations which are complementary or synergistic. While this becomes more difficult to do as the level of complexity of the design space increases, it remains a central goal of a portfolio design. It may be impossible to satisfy all assessment criteria with different instruments when more than one goal, policy or government is involved. The best way to address trade-offs and conflicts between criteria is to adopt a multicriteria framework which makes those conflicts explicit. This allows policy makers to give weights to those criteria and decide on the trade-off according to their preferences.

Linking tools and goals is a second area in which synergies and complementarities can be sought. Criteria such as 'consistency', 'coherence', 'congruence' and level of 'integration' have been suggested as useful in this area of portfolio design (Howlett and Rayner 2007; Lanzalaco 2011; Mandell 2008; Howlett and Rayner 2007; Kern and Howlett 2009). Work on mixes in sectors such as climate change mitigation and

renewable energy support (del Río et al 2007 and 2011; del Rio 2009, 2010; Boonekamp 2006) lead the way in this regard.

As del Rio (2009) has argued, design principles to promote integration in complex mixes require a broader view of the elements found in policy mixes than is typically found in the literature on the subject (da Costa 2013). That is, appropriate policy evaluation, appraisal and design cannot be conducted in a narrow context. The focus should not be on the functioning of specific instruments with respect to one specific criterion, but rather upon the functioning of the whole policy mix and the conflicts and synergies with respect to several goals and criteria in this portfolio. This is a particular challenge with overlapping policies and governments. What might be regarded as conflictive in the interactions within an instrument mix might not be so problematic when a broader picture of a policy or governmental mix is considered. But both horizontal and vertical coordination are very difficult to achieve. There is certainly a role for coordination between goals and instruments to mitigate conflicts and to promote complementarities and synergies in policy mixes. But the existence of different goals at different administrative levels complicates vertical coordination. Different benefits and costs for different constituencies stemming from supranational policies may lead to low levels of social acceptability and considerations of political feasibility. Different goals may create winners and losers at lower administrative levels and, thus, lead to unacceptable distributional effects. All of these factors must enter into design considerations.

Promoting Patching As Well As Packing in Portfolio Design

Finally there is the issue of temporality and how to handle it. Considerations on how to overcome temporal legacies in existing portfolios range from thinking about designing in a situation which Thelen (2003) describes as 'replacement' – that is, one in which design occurs *de novo* and all previous regime elements have been swept away or do not exist – and in situations characterized by 'layering' – in which design occurs within the context of difficult to remove policy elements (Rayner et al 2013).

That is, at least two distinct design techniques emerge here as formulation efforts may take the form of policy 'packaging', that is the creation of new mixes or 'patching' in which only selected aspects of existing mixes are altered. Recognizing the drawbacks of layering, conversion and drift as often promoting unintentional mixes, many critics have increasingly argued for the promotion of complex policy mixes through replacement. However multiple policy tool portfolios which have evolved over a long period time through processes of incremental layering can not easily be replaced. Policy 'patching' is a more realistic design modality in such contexts and, if done properly, with a clear eye on promoting coherence and integration in complex environments can achieve complex and ambitious policy goals in as efficient and effective a way as those designs which are consciously created as interlocking packages of measures (Feindt and Flynn 2009; Kay 2007; Howlett and Rayner 2014).

Conclusion

The multi-dimensional nature of policy mixes is a phenomena which has been ignored in most of the policy instrument choice and policy design literature, resulting in a lack of clarity and difficulties associating different kinds of actors and evaluation criteria

with mixes (Leutz 1999; Justen et al 2013a and 2013b) and the continual use of outdated or inappropriate design maxims in their construction which significantly enhance the potential for over and under-designing. Even with only three main portfolio dimensions – goals, policies and levels - the design situation is more complex and nuanced than is normally depicted in the existing policy design literature.

The aim of this article has been to develop the main elements of a theoretical and methodological taxonomy which can help to clarify the different types of policy portfolios which are currently often ignored or improperly juxtaposed in the literature on the subject. This was done in an effort to provide the basis not only for better designs but also for improved considerations of the formulation processes and actors involved in such complex policy-making efforts. The discussion thus contributes to efforts currently being made to assess the success or optimality of complex policy mixes (Mandell 2008; Howlett and Rayner 2013; del Rio 2014) and advances the project of revitalizing policy design studies urged by Howlett and Lejano (2013).

The paper argues that complex policy mixes inherently involve interactions between the different instruments of which they are composed, either in the form of conflicts or synergies. These can be defined as horizontal - between different types of instruments, policies or governments - and vertical - between different levels of goals, policies and levels of government. These two dimensions each contain a number of elements and a large number of possible permutations. However it is possible to refine significant mix types and design spaces to eight basic types: four relatively simple instrument mixes and four more complex policy mixes.

Mitigating the conflicts and encouraging synergies within these mixes through effective policy design first requires recognizing these different design spaces and their implications for what is being designed and by whom (Howlett 2013). Only then can efforts take place to enhance relevant horizontal and vertical coordination between and within different administrative levels and sectors relating to different instruments, goals and policies contained within a mix. The typology of outcomes set out in Table I above, suggests an increasingly complex environment for policy formulation as the complexity of portfolio parameters increases, ranging from relatively simple single instrument mixes to the multi-level, multi-goal and multi-policy bundles of higher numbered types (Keast et al 2007).

The potential for complementarity and coherency effects to be actualized increases in level of difficulty as more goals, policies and governments are involved in a 'bundle' or 'portfolio' and the number of actors and types of evidence used in designing correspondingly increases in complexity and variability (Escribano 2013). Developing such a multi-dimensional typology of policy portfolios, however, is a needed step, helping to clarify several outstanding issues in portfolio design which eluded existing literature on the subject. The typology allows us, for example, to begin to generate a multi-level model of tool selection and design showings how the problems (conflicts) in horizontal interactions can be mitigated by design principles such as coordinating targets, instruments and/or design elements and suggests that in many instances designing through patching will produce superior results to design through packaging or replacement.

Endnotes

[1] This axiom was first put forward by Jan Tinbergen in 1952 (Tinbergen 1952) and is sometimes referred to as the "Tinbergen Rule" of policy design.
[2] Tinbergen analyzed what he termed the 'normal' case in which it was possible to match one goal with one target so that one instrument could fully address its task and accomplish the goal set out for it. As Tinbergen (1952 p. 37) himself argued, however, "*a priori* there is no guarantee that the number of targets always equals the number of instruments" and (p. 71) "it goes without saying that complicated systems of economic policy (for example) will almost invariably be a mixture of instruments".
[3] The former subject saw some earlier treatment in studies on 'policy styles' which identified common patterns and motifs in the construction of typical policy designs in different jurisdictions reflecting these concerns (Richardson et al 1982; Howlett 2004) and contemporary studies have taken this work to heart in locating design decisions within governance arrangements and existing policy regime preferences (Howlett 2009).
[4] In order to focus our research to the most relevant types, for the moment we restrict the analysis of interactions which are implemented simultaneously, not sequentially.
[5] Such interactions can range from 'no effect' to 'direct interaction' with effects ranging from 'duplication' (positive or negative redundancy) to 'extended coverage' (positive redundancy). See del Rio 2007 pp. 1368-1369.

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