



TRANSNATIONAL
ADMINISTRATION
AND GLOBAL POLICY

Knowledge Alchemy

Models and Agency
in Global Knowledge
Governance

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Chapter 1

Introducing Knowledge Alchemy: Models and Agency in Global Knowledge Governance

Introduction

This book is about *knowledge alchemy* – a generic process of transforming mundane practices and policies of knowledge governance into competitive ones following imagined global gold standards and universal symbolic formulas. We argue and show that knowledge alchemy is prevalent around the world, informing national and institutional policies and practices on global competitiveness, higher education, and innovation. Given how interdependent the world remains, knowledge alchemy is also embedded in transnational administration and steers global policymaking. To understand contemporary national and transnational governance, it is thus essential to know how knowledge alchemy unfolds across multiple policy domains and sectors.

Over the past few decades, there has been a surge of global rankings and indicators, resulting in quantification and numerical comparisons of various domains. Global ranking producers now highlight education and innovation as remedies for future challenges of digitization and automation by algorithms. Knowledge governance – the processes of steering and governing state information – has been identified as essential in ensuring national economic competitiveness. As we highlight in our analysis, global knowledge governance is strongly future oriented and anticipatory, but somewhat paradoxically builds on historical analogies where the assumed medieval patterns of academic mobility, professionalization, city-states, cartography and navigation are now projected onto expected futures.

While imagining the future based on past developments may seem commonplace and expected, we argue that contemporary knowledge governance presupposes a transmutation process based on leaps of imagination. We critically analyze these processes through another medieval analogy, the practice of alchemy. According to one dictionary definition, alchemy is “the medieval combination of chemistry, philosophy, and secret lore aimed at transmuting base metals into gold (by means of the philosopher’s stone), and discovering the universal cure for disease and mortality” (Blackburn 2016).

As a precursor of modern chemistry (Rey 2018), alchemy aimed at defining universal formulas for transforming somewhat worthless materials into gold. Such transmutation was the ultimate goal of alchemists, the craftsmen of this trade. The work of alchemists involved many elements resembling the craftsmanship of chemistry, but without systematic rigour and modern scientific knowledge. Yet, early forms of chemistry, similar to alchemy, had connotations of hurrying or carrying out God's work (Knight 2013). While the role of alchemy in the history of science is increasingly acknowledged (Principe 2011), it still serves as a metaphor for muddling through, conjuring tricks, wishful thinking, or quasi science (for example Hutson 2018). While alchemists like Sir Isaac Newton failed in their endeavours to transform lead into gold (cf., Newman 2018), alchemy as a process of transformation or transmutation of value is ubiquitous to social life and human existence.

We see alchemy as metaphor for a generic process of valuing and transforming existing valuations. Society and the world polity are defined by constant struggles to determine the value or worth of individuals and institutions. By using this medieval era concept, we wish to highlight the surprising taken-for-granted nature of historical concepts and metaphors in explaining present and future challenges of knowledge governance at both the national and transnational levels. Alchemy involves the creation of value, from nothing as in the case of money or financial assets (Soros 2003), or from one form of knowledge to another, as in digitalization and monetization when bits are transmuted into money. Valuation takes place through classifications when a dividing line as a qualitative distinction is created between the excellent and gifted who pass an exam and the losers who fail, or when certain types of data or quantitative information, such as for instance English language research outputs or teacher/student ratios as academic benchmarks, are favoured over other types of data. These practices produce social value and determine the present worth of various objects, individuals, and practices; the expectations that are bestowed on them through this valuation process then in turn determine their future worth in contemporary eyes.

We do not use the concept of alchemy in pejorative terms for criticizing the work of the organizations and individuals analyzed. Instead, we wish to point out the rarely acknowledged limitations of indicator-based assessments and attempts to anticipate the future. Indeed, what we observe ordinarily is the contrary: indicator-based processes have become universally embraced as scientific, facilitating comparisons between different objects and subjects. Numbers as quantitative classifications carry scientific connotations of precision, methodological rigour,

and neutrality, but, in reality, there are many particularistic, qualitative choices and valuations underlying global indicators and related policy scripts. The absence of this acknowledgment is significant because it has implications for globally diffused policies designed to mitigate and transform our collective futures. For those interested in how national, regional, and transnational administration function, and how policies across the knowledge sectors are isomorphic, understanding the ways in which knowledge alchemy works is fundamental.

We are all enchanted by the “magic” of explaining social phenomena and predicting futures. Max Weber referred to disenchantment (Entzauberung) related to scientific analysis and rationalization that replaced religious explanations and effectively took its social role (Weber 2016). While for Weber rationalization little by little took the place of religious beliefs, we can on the contrary observe the development of new forms of worldly enchantment linked to “scientific” global governance. Robert K. Merton – a prominent figure of modern sociology whose analyses of the work of scientists remain an inspiration to us – actually had been a young aspiring amateur magician, who even ended up using his stage name in his future profession and adult life (Calhoun 2003). In his research, he was particularly sensitive to the social mechanisms by which values such as academic excellence are socially produced. Inspired by Arsène Houssaye’s term “the 41st chair” (Houssaye 1864; Merton 1968, 2), he used the example of the 40 “immortals” of the Académie française to illustrate the qualitative differences between the chosen “immortals” and the 41st, a “chair” reserved for a mere mortal, and often unlucky candidate.

Following a standard definition (cf., Plato 2008), we define knowledge as a belief that is considered and justified as being true. Justification means that the belief comes with an account. We need to add to this definition, for the time being. This addition emphasizes the temporal character of knowledge. For instance, we know today more about the COVID-19 pandemic than when it first started. We are not interested in the epistemology of knowledge as such, but rather on how knowledge or what is believed to be knowledge is produced and justified or legitimized in concrete circumstances and how it impacts definitions of reality and the distribution of power.

Comprehending how *knowledge alchemy* is pervasive in today’s governance is crucial for understanding how contemporary transnational administration functions and how global policy

is developed, implemented, and assessed. Using examples from North America, Europe, Asia, and international and transnational organizations that produce, broker, and use comparative assessments, models, and data on knowledge governance, we attend to the ideas, actors, practices involved in *knowledge alchemy*, as well as the outcomes. This chapter sets the foundation and introduces the analytical tools for this discussion. We show how the formulation of global models in innovation and higher education using indicators and algorithms and related conventions of knowledge production is guided by numerical scripts and formulas of global competition.

Conjuncture of Ranking and Digitalization

The rapid growth of global indicators also promoted certain policy models for knowledge governance. Standing research assesses rankings and indicators as tools of global governance (Cooley and Snyder 2015; Anheier, Haber, and Kayser 2018), sources of power through quantification (Davis et al. 2015; Merry, Davis, and Kingsbury 2015), and as governmental knowledge resources (Rottenburg et al. 2015). Scholars have discussed the changes on the higher education landscape concerning global university rankings, focusing on the methodology of rankings (Shin, Toutkoushian, and Teichler 2011; Dehon, Vermandele, and Jacobs 2009) as well as their effects on higher education policy and institutions (Hazelkorn 2011; Kehm and Stensaker 2009; Erkkilä 2013). Previous research has highlighted the discourse and global model of “World Class University” that now structures national higher education policy (Shin and Kehm 2012; Mittelman 2017; Rider et al. 2020). There are also studies on global governance that identify university rankings and education as one of its elements (King 2010; Chou, Kamola, and Pietsch 2016), or analyse how field development of ranking in competitiveness, good governance, higher education and innovation now constitutes a global model of knowledge governance (Erkkilä and Piironen 2018).

At the same time, artificial intelligence (AI) has become a global policy issue, linked with major social challenges as well as promises of unforeseen economic potential, productivity, and enhanced well-being (Brynjolfsson and McAfee 2012; McAfee and Brynjolfsson 2017; Pencheva, Esteve, and Mikhaylov 2020; Feijóo et al. 2020). Most of the analysis on the social consequences of algorithms and artificial intelligence broadly explore the potential changes in working life (Brynjolfsson and McAfee 2016; 2012; Ford 2016), professions (Susskind and Susskind 2017) and related corporate strategies (McAfee and Brynjolfsson 2017) that are now

also echoed by international knowledge brokers and ranking producers such as the World Economic Forum (Schwab 2017).

There are also critical observations about the “AI revolution” concerning qualitative shifts in capitalism and evolving power relations that are seen to pose significant, even existential challenges to democracy and economy (Zuboff 2019; O’Donovan 2019), involving accountability issues, systemic inequalities, and biases of algorithms (Bucher 2018; Eubanks 2018; Barth and Arnold 1999; Pasquale 2016). Principally, regulation of AI is approached as an ethical issue (Wong 2020; Council of Europe 2018; Ulnicane et al. 2020). In practice, it has become a matter of competition policy (Murgia and Khan 2019; Murphy and Waters 2019; Stacey 2019). Digitalization and automation are seen to challenge countries’ capacities in knowledge production and human capital. Education and innovation have become central for national economic competitiveness, marking a paradigm shift in industrial policy (Ketels 2006; Aiginger and Vogel 2015; Aiginger and Rodrik 2020), also visible in the global models and metrics of competitiveness.

Our analysis takes this conjuncture (cf., Mahoney 2000) of global ranking and digitization as its starting point. It holds that global rankings increasingly constitute a policy agenda on competitiveness amid digitization, associating it with human capital and competition over “talent” and research “excellence”. We see such policy models narrowing out policy alternatives and analyze critically the process where they are being adopted and upheld. We are particularly interested in the attempts to identify success formulas on institutional forms and practices that are critical for economic competitiveness. We further see these now increasingly relating to education that bridges innovation and global competitiveness, but also shifts the focus on cities that effectively host the innovation hubs and universities (Erkkilä and Piironen 2020). In addition to fostering local innovation and knowledge creation, the global policy models also highlight talent mobility, that is attracting talent through migration (Chou 2021).

Countries, businesses, and institutions all want talent, but how talent is defined remains contested. According to Cerna and Chou, talent has been defined in at least two ways in the management and migration literatures (Cerna and Chou 2019). First, talent can refer to certain qualities that an individual possesses, and thus a talent can be identified through the presence or absence of such qualities. These qualities can be intrinsic (attributes an individual was born with), or extrinsic (attributes an individual acquired). Second, talent can be used as a relational

concept, in which the addition of an individual improves the overall performance of an organization or business. Here, talents are identified through their demonstrated behaviour in comparison to other individuals in the same organizational setting or within distinct time settings. For Cerna and Chou (2019), how talent is defined has implications for policy design (see Chapters 3, 5).

The policies on competitiveness and human capital are actively influenced by international actors such as the World Bank and World Economic Forum. There is a recent “digital turn” in the work of these organizations that is directly linked with their ambit to measure the countries in economic competitiveness and innovation amid the emergence of artificial intelligence and automation, often termed as the “fourth industrial revolution”. This is visible in the revision of their existing measures, now claiming to analyse our digital future (World Economic Forum 2019; INSEAD, Adecco Group, and Google Inc. 2020), but there are also new signatory governance indicators launched to rate and predict the winners and losers of AI revolution (World Bank 2019; Tortoise 2019).

In previous accounts the general development in global ranking and its relation to algorithmic reasoning has been acknowledge (Johns 2016), but not systematically analysed.¹ Our book provides the theoretical tools for understanding how the global field of ranking has developed and why, and where it is going as it is increasingly linked to ideas of automation (see Chapters 2, 3). Instead of single policy domain, we focus on knowledge governance and see the rankings of universities, innovation, and competitiveness as interlinked, feeding to global policy models and imaginaries that now assume major changes in demands for knowledge and human capital due to rise of algorithmic reasoning. Furthermore, while there is consensus that indicators influence the policies of nations, there are few if any coherent analysis of what precisely makes them influential. Our book offers the theoretical structures with empirical backing to assess the institutional effects of numerical governance in the context of competitiveness and innovation, now increasingly linked to higher education, human capital, and talent competition. This book is also concerned with debates on policy diffusion and convergence, particularly from the perspectives of policy scripts, rankings, narratives, and conventions of knowledge production.

Policy Diffusion and Convergence

Scholarship on transnational governance has focused on global models and policy scripts as blueprints for policy reform (Carruthers and Halliday 2006; Drori, Meyer, and Hwang 2009; Halliday, Block-Lieb, and Carruthers 2010; Pinheiro and Hauge 2014), associated with debates on policy diffusion (Radaelli 2000; Simmons, Dobbin, and Garrett 2006) and adoption and translation of global policy ideas (Alasuutari, Rautalin, and Syväterä 2015; Gornitzka 2013; Sahlin and Wedlin 2008). The so-called World Society theorizing (Meyer et al. 1997) ties the above developments to rationalization of organizational forms that progresses with the global expansion of science, education and individual rights (Beck, Drori, and Meyer 2012; Koo and Ramirez 2009; Schofer and Meyer 2005; Ramirez, Soysal, and Shanahan 1997).

Scholars have also drawn attention to the role of international organizations in writing global scripts (Finnemore 2014; Kentikelenis and Seabrooke 2017; Meyer et al. 1997). The notion of soft power, associated with the cultural institutions and attempts to promote them through public diplomacy highlights popularity and attraction as mechanisms of influence of dominant nations that go beyond outright coercion (Nye 2004; 2008). The use of soft power in diplomacy has garnered interest from higher education observers, resulting in the emergence of an area of studies on knowledge diplomacy. To be sure, international organizations such as the World Economic Forum have also enjoyed such allure and used it in influencing global policy agenda (Garsten and Sörbom 2018). This also links to the global spread of liberalism (Simmons, Dobbin, and Garrett 2006) and the liberal world order (Börzel and Zürn 2020). Critical scholarship has also discussed this as hegemonic ideas of capitalism and its relocations, entailing also discursive power (Sum 2009; Sum and Jessop 2013).

However, though the previous research readily associates global indicator knowledge as instruments of promoting liberalism, illiberal regimes can also play the ranking game. China is actively promoting its science and education system with the help of numerical comparisons (Candido, Granskog, and Tung 2020) and has become a powerful actor in university alliance building (see Chapter 6). There are also other “numerical superpowers” that punch above their weight in the assessments, legitimizing their systems of governance. Often termed as “outliers” in the ranking analysis, the Asian Tigers such as Singapore and Hong Kong are shining in the comparative assessments, despite being criticized for their system of governance. This also shows limitations in the ways the indicators are laid out.

Previous assessments have highlighted numbers and indicators as policy instruments, though their effects carry potential for unintended consequences (Espeland and Sauder 2007; Pidd 2005; Robinson 2003; Smith 1995; Thiel and Leeuw 2002). Comparing and identifying countries and cities as forerunners and laggards in innovation and digitization, the global rankings also obtain governing functions, challenging traditional analysis of international relations (Porter 2012; Kelley and Simmons 2015; Broome and Quirk 2015; Löwenheim 2008). Scholars often refer to global indicators as Foucauldian technologies of discipline (Broome and Quirk 2015; Löwenheim 2008) or means of instrumental rationality in Weberian sense (Erkkilä and Piironen 2009), but also more subtly as tools of “social pressure” (Kelley and Simmons 2015), “reactivity” (Espeland and Sauder 2007) and “quiet power” (Merry, Davis, and Kingsbury 2015).

Scholars of higher education and innovation have pointed out how rankings have had profound effects on global higher education (Kehm and Stensaker 2009; Shin and Kehm 2012; Rider et al. 2020; Mittelman 2017). The global models are being mimicked also by those who are not credibly capable of becoming world-class institutions or even being ranked (Erkkilä and Piironen 2020; Kamola 2014). Countries are in different position in “channelling, filtering and buffering” the effects of global policy prescriptions due to their size, centre-periphery positioning, and institutional traditions (Gornitzka 2013), though governance by numbers is also prone to generate paradoxical and unanticipated outcomes (Espeland and Sauder 2007). For example, in peripheries of global innovation and knowledge creation, the attempts to embrace global scripts might even reinforce peripheralization and further exclusion from global innovation (Cantini 2019; Münch and Schäfer 2014; Hanafi and Arvanitis 2015; Yarrow 2020).

Such “global” policy scripts easily overlook “local knowledge” (Scott 1998) and “epistemologies of the south” (Santos 2014; 2018) or the local context (Guzmán-Valenzuela and Barnett 2013). The local application of a global model and its limits is often discussed as “decoupling” or “loose coupling” (Ramirez 2012), “glocalization” (Drori, Höllerer, and Walgenbach 2014), “translation” (Pinheiro and Hauge 2014) or “domestication” and “synchronization” (Alasuutari 2015) of ideas. The above concepts mainly focus on the adoption of global models and inclusion in epistemic governance but tend to underplay agency and autonomy by those adhering to global norms and scripts (cf., Perrotta and Alonso 2020), let alone institutional and political conflicts and active contestation of such models.

While previous research on policy indicators highlights their effects on national policies, we in addition draw attention to the conventions of numerical knowledge production that are currently steering global policy scripts of innovation and competitiveness. For those interested in knowing how global policy is formulated, implemented, and assessed, understanding how *knowledge alchemy* triggers which mechanisms to produce legitimate evidence is thus an important step towards comprehension.

Knowledge Alchemy and Conventional Power

It is widely held that modern individuals are rational, or at least this is the picture that is often painted of them in many political science textbooks. Economic theory and rational choice theory have elevated this principle into a doctrinal cornerstone. One effect of this belief is that events and actions that are in contradiction with this belief are forgotten or brushed under the rug. While it is easy to show that primitive man held all kinds of irrational, magical beliefs, it is more difficult to do that with modern man in what already Freud called our “scientific age” (Freud 1985). It is nevertheless evident that society and political life, higher education included, contain a lot of irrational and even magical aspects. One is the production of money, which is basically something that banks, private and public, perform by waving a magic wand (Boyer 2020), that is typing a sum on a keyboard and saving it on a spreadsheet. They succeed in doing what alchemists had been unsuccessfully trying for a long time, transforming nothing into something valuable. But alchemy does not only concern the financial world. The transmutation of value and the alchemy of knowledge that goes with it are ubiquitous in society.

For students of human rationality like Sir James Frazer and Freud, similarity and contiguity were the two principles of the oldest form of human knowledge, magic and animist thinking. To quote Frazer, “(M)en mistook the order of their ideas for the order of nature, and hence imagined that the control which they have, or seem to have, over their thoughts, permitted them to have a corresponding control over things” (Frazer 1920, 420). A natural phenomenon could be “produced” by simulating it through human action. The rain dance is a good example of this performative process. Similarly, by simulating a form of human organization such as a university, university administrators believe the same effects are produced. Isomorphism in organizational studies is a variant of this similarity thinking. In contrast to similarity, contiguity refers to the simultaneous “presence” or the association of certain values or actions. For instance, academic excellence requires the “presence” of certain objects such as a large endowment for

instance or actions such as sustained prized activity or trophy behavior that can be found in valued academic institutions.

Similar magical processes are at work when social values such as academic excellence are created. For instance, by instituting a categorical dividing line between those who enter university and those who drop out, a line differentiating the excellent from the ordinary is created, from nothing. As we mentioned earlier, Arsène Houssaye's book on the 41st seat of the Académie française provides a great example of this kind of social differentiation. Considered the most famous citizens in France, the 40 "Immortals" were elected for life. Houssaye's term of the "41st seat" referred to those who were not elected. In his book, Houssaye derided the election of unknowns and the growing list of luminaries, the likes of Descartes, Pascal and Rousseau, who never made it but deserved a seat among the "Immortals" (Houssaye 1864, 30). Compared to the "Immortals", a regular mortal occupied the 41st seat. But was it the fault of Descartes or Pascal, asked Houssaye? Or was it the fault of the Académie? How do we explain this seemingly contradicting outcome?

The same qualitative process is at work when global ranking lists qualify a university as a world-class university. In the case of ranking, quality becomes an emergent property of quantity. These categorizations have in common the qualitative transformation of something banal into something exceptional by separating qualitatively two groups from one another, producing value by instituting an ideal, invisible dividing line that is taken as a real divide between the worthless and the valuable. Objects grouped are then attributed certain values by the mere act of instituting a dividing line. Real likeness between them is secondary. Contact with the valuable also highlights the contagiousness of social values. For instance, this can be seen in the hosting of prestigious visiting professors or having faculty visiting or engaging in partnerships with those based at "top" universities.

In global knowledge governance, alchemy is at work in two analytical phases, digitization and digitalization (see Table 1.1). In the first phase, some knowledge is differentiated from other knowledge because it can be transformed into numerical data that can be instrumentally used in view of a goal. For instance, knowledge of incoming students can be quantified and digitized. The first phase consists in the transmutation of knowledge into numerical data that takes digital form (*quantification* and digitization). This phase is followed by a second alchemical operation, the transformation of data into economic utility (digitalization). In higher education, *commodification* might include a calculation of the pros and cons of raising the study fees for certain

groups of foreign students. This second phase includes the possibility of *automation*, of defining levels for automatic action or strings of actions for instance. Efficiency will be calculated based on the data available and, for instance, the level of fees will be dependent on the number of incoming students. For those interested in knowing how transnational administration works, it is essential to grasp that digitalization is now part of its everyday work. The pervasiveness of *knowledge alchemy* cannot be ignored because these transmutations, often taking place in the background, have a significant impact on the distribution of power in knowledge governance. Value formation is massively externalized to private companies like Google, Amazon, Facebook (Meta), and Apple, and to knowledge brokers such as Clarivate Analytics (web of science) that produce the databases and the digital tools that are used in public decision-making and in the evaluation of their efficiency. In higher education, rankings tools and the numerical goals they help set are used to reform universities and evaluate the performance or excellence of individual academics and departments or subject areas; similarly, indexes of competitiveness impact and steer city strategies. What are the conditions for the creation of value from nothing?

Table 1.1 The two phases of knowledge alchemy

Digitization	Digitalization
Information → Knowledge → Data	Data → Economic/non-economic capital

Source: Kauppi (2020).

The first condition is that data must be useful for someone (the tyranny of convenience). Digital devices that succeed in creating plus value, for instance something that helps in some banal activity like going from home to the workplace, are potentially economically valuable. Apple succeeded in beating Nokia because it provided more convenient features not sophisticated features. If a ranking list passes the convenience test, i.e., it makes it easier for someone (such as a student, an administrator, a politician) to evaluate the quality of an institution of higher education, then this individual will consider this tool as being legitimate. The proof is in the pudding. A second answer is that value creation is based on belief in the legitimacy of some social carriers of the actions in question. To succeed, it involves agents as tool users who are believable, credible, and thus legitimate. When your bank tells you that your loan request has

been accepted, you believe that you will receive the money. The same could be with entry exams instituted by universities, ranking lists of universities produced by ranking agencies, indicators of competitiveness created by important economic players like the World Economic Forum etc. The reflex or non-cognitive initial reaction is to trust, until further notice. If the university in the top group is not excellent and you can prove it, or that you will consider the metre as being bogus, then the magic might not work for you. But as long as the transmutation is not put into question by a relatively large group of people, it works. This is what the power of social convention is about. But this peer pressure has evolved with dramatic technological changes that have created new forms of social domination.

The term “conventional power 2.0” (convention + data) (Kauppi 2020) describes the special kind of symbolic domination in global higher education. The sociology of conventions teaches us that a convention provides the implicit, taken for granted background that conditions action. For it to work, it is not questioned. For this reason, it is difficult to resist it: there is no clear target, not even the convention itself as it is sufficient for domination to work when users are *assumed* to be familiar with it. In global higher education, rather than materially, economically or legally forced to adapt to the new rules, the users of university rankings “freely” adopt their values. Used to academic hyper-competition, for them performing on a standard-based global level is psychologically rewarding and socially compelling (Graz 2019). Even more so as the values promoted are now represented in “scientific” and “objective” form as data and digital tools, based on their users’ implicit trust in numbers (“number hypnosis”), a second key ingredient of conventional power 2.0. This hybridity of soft and hard power in conventional power 2.0 exemplifies a modern version of Max Weber’s “steel-hard casing” (Weber 2010). The more these tools are used, and their use institutionalized and embodied in institutional and personal self-identity (Kauppi 2020), the harder the casing gets and the more difficult it will be for their users to free themselves. Conventional power 2.0 combines the silent force of the imaginary produced by the convention (including implicit peer pressure and the fear of not being finally included in the “in-group” as a “world-class university”) and the brute force of data (as “evidence”).

Knowledge alchemy as an increase in the value of an object is a core technique of global knowledge governance in the neoliberal age. Knowledge devaluation is the symmetrically opposite transformative technique whereby some type of knowledge is devalued or just simply ignored. For knowledge alchemy to work knowledge devaluation is necessary. For instance, the use of the teacher/student ratio as a numerical representation of teaching quality requires

that some other types of representations of teaching quality are devalued or ignored. In contrast to these transformative techniques a third ubiquitous core technique that is used in the second stage of knowledge alchemy is reproduction, that is that data or parts of it are copy-pasted to value or devalue certain objects. As we will see later, certain types of knowledge, such as those produced by leading higher education institutions like the Institut Européen d'Administration des Affaires, more commonly referred to as INSEAD, are more prone to reproduction than other types of less legitimate knowledge.

Policy Scripts, Rankings, and Conventions of Knowledge Production

Policy scripts are generally understood as generic policy models that define specific but generalizable measures to address a policy issue, while prescribing action (Kentikelenis and Seabrooke 2017). The generalizability and predetermination of global policy scripts, as well as their prescriptive nature, has intensified through the use of indicators, as we discuss in Chapters 2 and 3. Global policy models on economic competitiveness, innovation, and human capital are increasingly communicated with the help of global indicators; relevant rankings are known by everyone in a policy field and allow comparisons and shared understanding of goals. While the figures are intended as tools of evaluation, they also have constitutive effects (Kauppi and Erkkilä 2011; Dahler-Larsen 2014), steering the activities of innovation governance through reflexivity of those being ranked.

One constitutive aspect of numerical governance are the path dependencies of indicator production. We see this as field development in global ranking (Kauppi and Erkkilä 2011; Erkkilä and Piironen 2020; 2018), where new indicators are emerging to challenge the existing ones with methodological improvements or new conceptual avenues. This classification struggle is also linked to competition between the international organizations and other index producers that are under pressure to develop their signatory indicators as they compete with each other over prestige and funding (Freistein 2016).

But this race to produce alternative metrics has consequences for global governance, as the knowledge production has entered an ontological trap: to challenge the simplified policy feed of existing rankings, the knowledge producers are compelled to produce alternative figures (Erkkilä and Kauppi 2010). You can only fight the numbers by creating, yet, another number. Typical for structuration is that the attempts to create novel institutional practices often end up reproducing existing ones (Giddens 1984, 5). This is apparent in the work of the aspiring

knowledge producers who are under pressure to validate their figures against the existing metrics (cf., Gieryn 1983; Haas 1992), leading to conformity through sharing of concepts, methods, and even data.

Moreover, most of the global rankings are so-called composite indicators that draw their data from various sources. Hence, the production of such rankings is conditioned by the availability of data. As we will discuss in our empirical analysis (see Chapters 2, 3), the field development in global ranking now proceeds through the availability of data, steering the potential topics of analysis as well as its conceptual operationalization, and not vice-versa (cf., Sartori 1970). We argue that the conventions of making, validating, and using numerical knowledge now constitute global policy models of competitiveness and innovation, making them also seemingly transferrable from one context to another.

The simplified numerical representation of complex policy issues allows the models to travel, but, more importantly, the numbers now also allow holistic analysis through merging of different datasets, which leads to the intensification of policy scripts that draw elements from different policy domains, while being monitored almost real-time. The governance of knowledge and human capital is a prime example, as it is currently linked to policies of innovation, migration, urban governance, and individual rights. These associations are constituted already on the level of indicator production, through reuse and borrowing of data, and its algorithmic manipulation.

Time, Narratives, and Conventions

However, to become effective, the numerical knowledge also needs to be narrated and communicated. As knowledge structures scripts describe predetermined sequences of events based on *storylines* (Schank and Abelson 1977). Our analysis of policy narratives shows how claims about future are done through references to past, as various “traditions” are evoked to justify policy measures. Such invented traditions (Hobsbawm 1987) also coincide with conceptual shifts that happen in a context where past concepts of governance no longer fully fit the horizons of expectation of anticipated future (Koselleck 2004).

Political scientists have examined and conceptualized “time” in politics and policymaking from various perspectives. We can understand time as a form of power, as a structure conditioning development, as a category of continuity and change, but also as horizon of expectations that

is tightly linked with conventions and practices. Time is also present in discussions of *Zeitgeist* or ideational cycles (Marcussen 2000), entailing ideological trends. Studies on institutional and political traditions as well as organizational memory and culture also hold time as an element of analysis (Walsh and Ungson 1991). Time is perhaps most clearly present in institutional analysis, where institutional development and structuration is discussed under path dependence (Pierson 2000; 2004), and sequencing and conjuncture of institutional developments (Mahoney 2000). Time is also implied in the analysis of incremental institutional evolution (Thelen 2004) and (rapid) changes through crises and junctures of governance (Peters, Pierre, and King 2005; Krasner 1984) that result in transformation. The tempo of time has fascinated scholars of higher education interested in the transformation of the modern academe. For instance, higher education scholars have studied time as a category of change in “accelerating academia” (Vostal 2016) and creating and managing future horizons in “anticipatory governance” (Robertson 2017; 2022).

Since present judgements are often said to be based on earlier decisions, ideational schemas also tend to steer and captivate ways of doing things, causing ideational patterns (Marcussen 2000, 17). The ideational route that we choose to take over time creates a pattern of its own, because actors validate their decisions at present against those made in the past. This logic comes close to that of historical institutionalism and path dependence, as well as Giddens’ view of structuration, where attempts to create something new often tends to reproduce existing practices (Giddens 1984), a process of reinforcement. In a similar fashion, scholars of science and technology studies have analyzed “socio-technical imaginaries” that carry narratives and ideas of collective technological futures (Jasanoff and Kim 2015).

This also links to assessment of time in analysis of political imaginaries that build on shared cultural ethos and cognitive structures (Strauss 2006; Taylor 2002; 2004; Castoriadis 1987; Anderson 1991). Scholars of political economy have highlighted the importance of imaginaries for capitalism (Jessop 2004; 2010), particularly in assessments of uncertain future (Beckert 2016). Imaginaries are also highlighted in analysis of globalization and global governance (Kamola 2014; Steger and James 2013; James and Steger 2014; Archer 2012; Alasuutari and Qadir 2016). We see the rankings constructing an imaginary of global competition, where countries, regions, and cities are out to compete with their like units. Moreover, the global indicators colonize the future (cf., Robertson 2017) through their rigid assessment criteria, predictions based on countries’ past performance, and by framing education policy as a matter of economic competitiveness.

Imaginarities can also be considered as being forms of ideational interests that exist in specific relationships with material interests. While for Marx material and more specifically economic interests ruled the world, for Weber, contrary to many misleading interpretations, ideational and material interests were in constant interaction with one another (Weber 1959). His famous train track metaphor captures some of these dynamics. While material interests determine the direction and speed of the train, in some historical circumstances ideational interests, for him developments in religion, can redirect the train and redefine social development. A religious outlook like Calvinism can have a decisive impact on economic development. Imaginarities are not only linked to material and ideational interests but also to habitual patterns of behaviour that in turn determines what has priority. For instance, ways in which actors classify the world around them, or the cultural conventions that determine what is normal and legitimately expected (Duby 1980). These social and cultural structures vary with time and space.

Ideational schemas usually change in a process where they are delegitimized or disconfirmed. This usually happens after a shock/punctuated equilibrium or critical juncture, when there is an ideational vacuum or multiple crises (Schmidt 2002; Blyth 2002; Marcussen 2000). However, to become embedded in the existing institutional practices new ideas and policy discourses also need to resonate with the prevailing public values, narratives and collective memory (Somers and Block 2005), often related to references on institutional traditions (Neustadt and May 1986; Hobsbawm 1987). In fact, such reflexivity over institutional history and traditions is a mechanism of policy diffusion (Erkkilä 2012).

We can also criticize institutional analysis for their somewhat generic analysis on the role of culture as an explanatory factor for institutional development. Culture is often reduced to values and norms, beliefs, cognitive and ontological models or scripts, without elaborating the mechanisms through which these become effective (Schmidt 2006, 107; DiMaggio and Powell 1983; Mahoney 2000, 517; Meyer et al. 1997, 149–51). We would wish to draw attention to conventions in upholding institutions, as well as habituation as a mechanism through which conventions are embedded into institutional practices.

Such conventional power is not rooted in active reflexivity over norms, as conventions are regarded as legitimate and self-evident, pervading hence mundane practices of everyday life. It also further broadens the horizon for structurally inclined institutional analysis by asserting individuals in the analytical frame. For example, instead of simply considering the self-rein-

forcing processes of path dependence from the perspectives of economic constellations or normative pressures, we should in addition consider its mundane habitual aspects where practices are not actively reflected upon but rather conducted “as usual” by individuals.

There are also considerations of time in social science research methodology (Abbott 2001; 1997; Mahoney 2003; Vennesson 2008; Neale, Henwood and Holland 2012). Conceptual historians have observed ideation changes over time, drawing attention to conceptual change in both accommodating ideational change and driving it (Koselleck 2004; Skinner 1969; 1989). Reinhardt Koselleck (2004) has also drawn attention to different timescapes, such as slow and fast time and their synchronization.

Our analysis of policy narratives shows how claims about future are done through references to the past, as various “traditions” are evoked to justify policy measures. Such invented traditions (Hobsbawm 1987) also coincide with conceptual shifts that happen in a context where past concepts of governance no longer fully fit the horizons of expectation of anticipated future (Koselleck 2004). Our analysis of the narrative elements of global policy models explores invented traditions in knowledge governance and mobility. We show how the transnational policy scripts now build on historical narratives on pre-modern era city states (Medici era Florence), Popperian open society and early 20th century Vienna, as well as a myth of Medieval scholar. There are also economic and technological narratives seeking historical reference points in industrial revolutions and innovations of the past. These narratives now argue for continuity of governance at times of disruptions and propose seeming solutions for current challenges of knowledge governance.

Conclusions

To summarize, our book explores the interrelation of global indicators, algorithms, and knowledge governance. We aim to provide detailed and critical analysis of the rationalities and mechanisms of global numerical governance and diffusing policy models. The theoretical and conceptual frame followed throughout the book explores the emerging conventions and practices that build on predetermined formulas, models, or scripts. We refer to this process of transmutation as *knowledge alchemy*. The book also provides detailed case analysis and a narrative on the development of numerical governance and its central actors (the global knowledge producers, brokers, and users), as well as the productivist bias (quantity over quality) and imaginaries (as ideals and embodied action) (Kauppi 2000; Strand and Lizardo 2015) with which

they operate. Acknowledging historical aspects of governance, narratives, and culture as well as institutional trajectories in absorbing and shaping the global policy scripts, we further assess how the models are being translated in national, sub-national, and institutional contexts.

The book is organized as consisting of two parts. In Part I (Chapters 2 and 3), we detail the making of the models of global knowledge governance over time, focussing on the indicators proposed to assess competitiveness, introducing the network of indicator producers and brokers, and discussing the increasingly shared data sets used to construct such rankings. Here, we describe how knowledge alchemy became the dominant mechanism in global knowledge governance in the last decades. In Part II (Chapters 4, 5, and 6), we turn to the scripts or storylines, and the many sectoral policies and initiatives generated through knowledge alchemy. Specifically, we analyze how the imaginary of the global talent competition drive much of what we see today in global knowledge governance. Our analysis is a critical one. We highlight how the narrative of the global talent competition stems from selective interpretations of the historical past (in particular, the lore of the Medieval Scholar) that is now projected on the current understanding of the world, and how to organize our future. In the concluding chapter, we step back and reflect on what knowledge alchemy holds for our collective future and argue for the need to regain reflexivity as we are hurled down the digital train track, made possible by the immense data collected about us and purportedly for us.

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¹ Previous analysis on automation and algorithmic governance often provide broad overviews of the promises and perils of artificial intelligence (Armstrong 2014; Bostrom 2016; Tegram 2017; Shanahan 2015; Domingos 2017) that go beyond the transformations related to more traditional government information systems (Falk, Römmele, and Silverman 2016; Milakovich 2012; Hood and Margetts 2007; Dunleavy, Margetts, and Bastow 2006).