THE MINIMAL ACCOUNT OF PATH DEPENDENCE:

Redeveloping the Concept of Path Dependence

Based on its Use in Political Science

By

Karlo Mikić

Submitted to

Central European University

Department of Political Science

In partial fulfillment of the requirements for the degree of

Master of Arts in Political Science

Supervisor: Dr Imre Gergely Szabo

Austria, Vienna

June 2023

Abstract

This thesis aims to (re)develop the concept of path dependence from the ground up, starting at the simplest intuitive understanding of the term as used in the work of political scientists in the tradition of historical institutionalism, i.e. that "history matters", or that past events can influence the range of possibilities and likelihood of certain possibilities among the future events. This conceptual engineering is undertaken because the standard account of path dependence taken from economics is shown to be inapplicable to social reality and the proposals for a theoretical framework that would replace it have not attained the needed coherence required of a complete theory, nor were they able to keep all of the interesting and important aspects asked for in the literature, useful in analyzing institutional change. The thesis has three main parts: the first presents the standard account in economics and its application in the context of political science, the second part is reviewing the literature regarding the previous proposals for extending, changing or reviving the standard account for the needs of political science and showing their incompleteness, the third part develops and presents the original minimal account proposed as a theoretical framework for grounding the concept of path dependence, while also allowing its further specification.

Table of contents

List of figures

Introduction

This thesis will present and revise the theory of path dependence (henceforth: PD) in the context political science. The structure of the thesis is as follows: after presenting an overview of the standard account (henceforth: SA) of PD, an example of its usage in political science will be given from (Pierson, 2000) for the general overview. Those accounts are then critically reflected upon. They are followed by later developments of PD in social sciences, with each subsequent development examined. In the end I will, in broad strokes, propose an account of PD that evades all of the controversial points discussed earlier.

This thesis has one main goal: to provide an alternative framework for conceiving PD, resting on a minimal definition, broad enough to contain more specifiable ideas about it. No other project of theoretical grounding for PD took a comparable systematic approach based on simple intuitions behind the term. I find the SA of PD taken from the work of economists Brian Arthur and Paul David to be burdened with accidental or unnecessary constraints. Their account is conditioned by assumptions which make it impossible to apply it to any process in social reality. I find the criticism employed by some authors in the literature based upon adherence to the account originally given by (Arthur, 1989) and (David, 1985) essentially ungrounded or, worse yet, self-refuting. Because, if PD can be conceptualized only in terms of the SA, then PD ought not to be conceptualized at all, because it is theoretically unsound. I will try to offer a conception and definition which will make possible to keep the interesting characteristics of PD processes for social-scientific purposes, while ridding it from those standardly presupposed features that result in a theoretical thicket. Namely, the properties of contingency of initial conditions, multiple preferentially-equivalently ordered equilibria, lock-ins, increasing returns, etc. The notion of PD itself can be taken as an example of a PD

development of a theory – although the SA is imbued with theoretical and practical quagmires, it persists because it was originally defined in a particular way.

My argument for the abandonment of SA rests on these premises:

a) The idealized formal assumptions comprising the SA, i.e. contingency and stochasticity, render it impossible to be instantiated in the real world.

b) The assumption of multiple equilibria, whether (I) equivalently efficient or (II) ordered by efficiency is respectively: incoherent, and it contradicts certain neoclassical assumptions making it incompatible with the economic mainstream.

c) The features that are usually taken to describe the interesting aspects of PD, such as increasing returns, suboptimal outcomes and lock-ins, by themselves are not necessary nor sufficient for PD. Their absence is not enough to conclude that a certain process exhibiting them is not PD, nor is their presence enough to guarantee it is PD. What remains unformalized in the SA is what I take to be enough for a sufficient condition of PD – that the space of possibilities for later events in some process is shaped more by the past than by its concomitant events.

In replacement of SA I propose the minimal account (henceforth: MA) of PD presented in Chapter 4. MA leaves out the common assumptions underpinning SA and its extensions, namely: contingency of initial conditions, the possibility of rationally and efficiently equivalent (nevertheless preferentially ordered without assuming some deficiency in agents, e.g. in their cognition, volition or information), unavoidability of lock-ins, endogeneity, and the purely negative effect of PD on the relationship between *ex ante* and *ex post* rationality[1]. The MA presupposes only that later events in a certain temporal sequence

[1] Meaning that an inefficient outcome is indefinitely preserved rather than an efficient one.

can be constrained (whether in limiting or broadening manner) by former ones, while preserving the possibility that an optimal solution can become too expensive to still be held optimal inside some practical scenario. The proposed MA conserves the practical results of SA but it resolves its theoretical and conceptual difficulties found in the literature where some mechanisms (e.g., increasing returns, self-reinforcement) and outcomes (lock-ins) are claimed to be crucial for PD, leaving out other clearly history-related relevant mechanisms out of this notion (such as structural inertia, institutional layering, repurposing, etc. – MA allows to consider such relevant mechanisms as equally possible causes or instances of PD). For example, it eschews the questions of continuity and change that boggled the literature because it was focused on lock-ins as paradigmatic cases of PD situations. The MA does not give a special place within the theory to lock-ins but takes them as an extreme form of PD situations which do not allow for further changes outside the scope of the supposed developmental logic of the process at hand.

Although I did not derive this notion of PD from any particular notion found in the literature, it was conceived to be in agreement with the theoretical desiderata yielded by the discussion of what the literature found the SA to be lacking. I take MA to be a preferable framework because it is set up systematically on the basis of the most general features of PD considered abstractly, while it also incorporates all of the points raised in isolation by the authors considered. Broadly speaking, the purpose of defining MA is for it to serve as a basis for the kind of analyses made by historical institutionalists. On the other hand, it also provides the ground for the same data which motivated the original work on PD in economics, but without the recourse to abstract mathematical modelling.

Finally, the purpose of this thesis is to work out a general theoretical elucidation of the idea of PD and to devise a framework in which all PD phenomena might be situated, categorized and understood. The purported advantage of this approach is its closeness to pre-

theoretical, intuitive understanding of the term path dependence, from which more specified versions present in the literature could be developed.

1. The Standard account of path dependence in economics

Here I will informally present the general notion of PD. Although it might seem surprising, I do not find it necessary to delve into the intricacies of a formal treatment. The reason for that is that the formal development is built on certain informal assumptions, which I find crucial. Therefore, I believe that an informal account is enough for the purposes this thesis sets forth.[2]

1.1. Key assumptions

(Puffert, 2008) explains PD and gives the overview of its central concepts in the context of economics. His definition of PD takes it in a broad sense as

> "the dependence of economic outcomes on the path of previous outcomes, rather than simply on current conditions. (...) Choices made on the basis of transitory conditions can persist long after those conditions change. Thus, explanations of the outcomes of path-dependent processes require looking at history, rather than simply at current conditions of technology, preferences, and other factors that determine outcomes" (ibid).

Such notion is said not to be an alternative or a contender to mainstream economics, but it supplements it on the basis of assuming that although rational behavior by individuals is constrained by their preferences and available information, it is possible for decisions made earlier in some sequence of events to influence and constrain choices available for later ones. He notes that PD situations in the context of institutions are plausibly similar to the one in economics of technology because both contexts derive their increasing returns from adoption of some convention as a standard, which due to positive network externalities becomes the most efficient outcome, compared to the costs of making a change.

[2] Cf. Appendix 1 to this thesis for an elaboration on methodological issues.

When speaking of the conditions bringing to PD (David, 1985) mentions:

(1) the quasi-irreversibility of investment (on account of sunk fixed costs, comparable to later condition, stated by Puffert, of durability of capital equipment) which is the simplest case and lasts as long as such equipment is durable,

(2) technical interrelatedness – referring to situations where parts of something are being replaced in asynchronous and piecemeal fashion and almost never totally and simultaneously, and finally

(3) economies of scale – resulting in increasing returns, rising from a larger pool of users and coordination, and conversion costs of making a change.

These conditions together invalidate the practicality of incremental change and raise the cost of rapid change, leading to a state of persistence – a lock-in – in a path. David models increasing returns by means of Polya urn, a setting with equal initial number of balls of different colors in which drawing one ball from the urn gets the same color replaced and incremented by additional ball so that the probability of that color being subsequently selected increases afterwards.

Modelling the concept, it is standardly taken from (Arthur, 1989) that small contingent historical events ("events or conditions that are outside the *ex-ante* knowledge of the observer" (ibid, 118)), commonly treated as random, fluctuate over market compositions of competing products or techniques, which are supplemented by positive feedbacks when some of them enlarge their market share, due to the aforementioned positive network externalities, finally getting locked-in when that market share becomes substantial. The SA takes as a given that depending on the taking of one among the multiple contingent paths it is possible to arrive at different initially equally likely stable equilibria as outcomes. Originally all of the equilibria in the model were equally efficient, but later theorists favored to focus on the

possibility, mentioned by Arthur, of having a less efficient outcome as the one becoming locked-in.

1.2. Some problems with the Standard account

Offering their critique of Arthur's standard model (Liebowitz and Margolis, 1995) argued that two assumptions would prevent locking-in, namely: foresight into future effects of present decisions and influencing people's choices by coordinating them with information channeled through the promotion of products in the market. Still, it is possible for PD to arise irrespective of supposed perfect consumer information due to lasting exogenous shocks. Also, it is well documented in the context of hysteresis effect in labor economics (Ball, 2009) that following a recession the unemployment rate often becomes structural and raises the natural rate which becomes insensitive to normal increases in aggregate demand. But more specifically, in the context of technology, we can imagine some technology dependent on a certain type of scarce resource driving it in obsolescence compared with a technology relying on a more available one, despite the former being more efficient (in terms of overall cost or its function) and then when the latter becomes dominant, assuming network effects and fixed costs, even if there is some discovery of previously unavailable reserves or a method of synthesizing the scarce resource which makes it comparable to the abundant one, it could be practically less desirable to replace the whole network than to keep using the theoretically less efficient technology due to the psychological appearance of the cost, considering how we are often prone to give more weight to the more immediate than distant, especially if the payoffs are not dramatically different.

Further, if we assume the mainstream economic framework, it is possible to explain away the notion of multiple equilibria. First, if we assume a situation of equally efficient

multiple equilibria, PD is superfluous in understanding a lock-in. By the usually assumed economic principles multiple equilibria behave the same as a unique equilibrium situation. Under the latter (supposing preference-ordered rationality, perfect competition, perfect information, etc.) a lock-in arises as a result of usual market forces and the only thing that could disrupt an achieved equilibrium is an exogenous shock. With multiple equilibria, things are slightly different but amount to the same. Suppose we have two substitutable goods, A and B, both trading at the same price, both being equally available and demanded. Their market shares should be equally distributed, and the original equilibrium point for either of them, i.e. the equilibrium point for the type of good C which subsumes A and B will be the same. Supply of A and B would then be adjusted accordingly by each producer. Suppose now we drop any one among the equalizing assumptions. One good will start to dominate the other, but it will happen so because the dominating good is still at the point of equilibrium for the supposed type of good, for whatever reasons, while the dominated good no longer is. The idea that one good can dominate another under multiple equilibria supposing all else being equal is incoherent. The contradiction arises because such an outcome can only be the result of a biased choice, while we are supposing unbiased rational agents. Even if such a situation could be conceived, the moment the market started gravitating towards a specific equilibrium it would become locked-in by its forces.

On the other hand, suppose PD can arise for equilibria ordered by efficiency. A natural equilibrium would be a point where supply and demand are met solely due to preferences by their respective agents, without external influences. That equilibrium is to be held the most efficient one. Less efficient equilibria should be taken to represent the rearrangement of the market agents in response to external influences. Depending on the dynamic in a particular time point a meeting point that is not an equilibrium at one time, might become one at another, due to it becoming the least expensive achievable possibility for both parties at that

time. Considering that, less efficient equilibria would be considered non-equilibria from the point of view of the natural equilibrium. Depending on context, the given best achievable equilibrium would, for all practical matters, be taken as a natural one. In that case everything else follows as in the first case. Therefore, every stable equilibrium under these assumptions is to be considered the most efficient equilibrium point attainable, again rendering PD theoretically superfluous.

What would then be necessary for conceiving a situation in which a practically attainable more efficient equilibrium is not pursued? Even in cases of sunk costs or network effects, a rational analysis would dictate that the long-run opportunity cost for keeping the less efficient option would become overwhelming. That would also be allowed by the implausibility of perpetually increasing returns – when some standard becomes generally established its increasing returns would become neglectably marginal, and if it becomes universal the returns could at best be constant. But it will be shown that PD can arise even with decreasing returns, so this cannot be decisive. For it to be possible the constraints taken into account need to be loosened: maybe the relevant information not sufficiently available, or we have a case of monopoly, or agents are irrational in the 'failure-of-will' sense, knowing something is better for them but unable to consistently act on it because of some conative/behavioral deficiencies. But we cannot just compare across different accounts as though they are just multiple instances of the same. An equilibrium obtaining under imperfect information would not obtain under the opposite assumption, everything else being equal. Therefore, a time-slice analysis, under a constant set of assumptions, would always necessarily provide a definite unique choice for the most efficient equilibrium in each subsequent frame or step of analysis.

The possible venue for making sense of PD is taking different contexts - the content of which are different assumptions - into account dynamically. Thus, we move to a lesser degree

of abstraction, in which the operative forces at hand "will be mediated by the contextual features of a given situation often inherited from the past' (Hall and Taylor 1996, p. 941)." (Kay, 2005:565)

Say that good A dominates good B, although, given some other circumstances, the production cost of B could be lower with a greater demand also on account of it being more preferred. Although the present equilibrium is less efficient than a theoretical one regarding B, it will stay as such in the long run in the absence of some lasting external shock. But, if at a certain point in time we change the information parameter, the market can acquire the tendency towards the more efficient equilibrium. Now, a lock-in becomes possible based on the mere degree of informational (in)completeness. Let A have more utility in the long run, but less in the short than B, and that it is dominating. Then, suppose that due to some false discovery the state of information deteriorates resulting in 10% of agents becoming convinced B has more utility. It is possible that enough agents change their preferences in the short run so that positive feedback arises, and B starts dominating. Suppose further that because of some ideological reasons the state of information about A and B rigidifies, making it incredibly costly to accept the truth about their utilities. The result is B dominating A in a lock-in as long as the conditions for that informational deficiency hold, even if a portion of population can evaluate them correctly and prefers A. That portion will depend on further constraints of how costly it is to acquire A and to hold the respective belief privately and publicly. In an extreme scenario where A is taken as a radical ideological anathema to the majority of the population, in time the vast majority of agents may become strongly disincentivized in holding the correct belief about A. In this case, the joint effect of the more immediate benefit of having B and informational deficiency were triggering PD. As a result, from the standpoint of agents with incomplete information, the assumed inefficient equilibrium is the efficient one and no PD obtains.

In any case, regardless of the debate about the status of some of these assumptions in economics, it is fairly obvious that a few if any of them can hold in the context of politics – as is pointed out by Pierson, seen in the next section, political outcomes do not have clear signals of their value, i.e. the worth of various competing political institutions is not straightforward and transparent but opaque, while on the other hand vested interests and ideological polarization – the conflictive nature of political life – is preventing the adoption of any such "blueprints" to the best political organization even if they would be possible and available. Political situations would always constitute either what (Liebowitz and Margolis, 1995) termed first-degree or second-degree PD, meaning respectively that there is no inefficiency involved in the outcome, or that there is a theoretical inefficiency at play but for all practical purposes the theoretical efficiency was impossible to attain. The third-degree PD, consisting of "remediable inefficiency", is, in practice, unattainable in the context of politics because of the aforementioned valuational problems. Although the event of PD in political context is far murkier from the common market agent standpoint, and possibly far less remediable on that account, it is still possible to descriptively evaluate political decisions and institutions, because in many cases they will have great influences on the wellbeing outcomes of the population.

2. Path dependence in political science

In political science PD is usually taken up in the work done by historical institutionalists, trying to describe and explain particular historical conditions which shaped the courses in which institutional frameworks of certain societies developed. Although many historical institutionalists used PD as their term of choice to refer to such cases of historical conditioning, their discussions did not directly try to accommodate SA, as formulated in the context of economics, to their own examples, nor did they give much thought to the origin or the theoretical implications of the concept behind the term. Paul Pierson was the first political scientist who tried to provide a clear and systematic account of PD in the context of political science, synthesizing the main features of SA with the considerations of critical junctures around which historical institutionalists developed their work.

2.1. Pierson's application to politics

As we have seen, the basic idea of SA is that as events progress different routes are being rendered less and less likely to occur because of their cost and the one on which the process in question progresses becomes more and more entrenched, i.e., earlier events matter more for the determination of a path.

In political science this is used to explain the persistence of certain institutions or social phenomena in cases where adhering to them seems to defy the assumption of rational efficiency-seeking but makes sense if increasing returns are assumed. Increasing returns means that "the relative benefits of the current activity, compared with other possible options increase over time" (Pierson, 2000:252), i.e., choosing those other options becomes more

costly the farther we go in a PD sequence. For Pierson, processes exhibiting increasing returns are characterized by unpredictability in their start (because of the initial multiple possible equilibria), inflexibility in their mature phase (due to lock-ins), non-ergodicity (meaning the importance of accidental events happening early on for determining the non-uniform future course of the sequence) and potential inefficiency (on account of the entrenched path not being the optimal one).

According to Pierson, political phenomena are particularly prone to developing PD because of the fundamental concern of politics – the provision of non-marketable public goods through a system of compulsory regulations enforced by an authority, the attainment of which is often a zero-sum game. Politics in general exhibit the following features:

> 1) "the central role of collective action" (depending on other people's decisions which lead to adaptive expectations),
>
> 2) "the high density of institutions" (because political authority is applied universally throughout a polity),
>
> 3) "the possibility of using political authority to enhance the asymmetries of power", resulting in self-reinforcement of power regarding expected reactions and ideological indoctrination, and
>
> 4) its intrinsic complexity and opacity (due to a lack of something equivalent to price signalization in the markets, making the decisions of actors rest on various other considerations) (ibid, 257).

In short, the lack of an inherent efficiency-maximizing procedure, and a bias towards keeping the status quo are all exacerbating increasing returns in politics. Interestingly, (Vincensini, 2001) takes some of those features as obstacles for transposing PD from the context of economics of technology to political institutions. Namely, she finds the underlying mechanisms, the measurement of institutions' efficiency and the picture of technological change to be problematic. She points out that the assumption of increasing returns which holds for technology is not self-evident with regards to institutions. Further, she takes the

possibility of an inefficient outcome to be one of the hallmarks of PD in the context of technology and observes, in line with Pierson, that comparing efficiency of outcomes is far more difficult when studying institutions and that oftentimes the usual institutional interdependence makes taking the level of institutional framework in its entirety more important than the level of single institutions. Ultimately, taking one among several equilibria may not happen in an institutional framework where diverse coexistent institutions are possible, but the same also applies to technology when assuming a Schumpeterian perspective of bricolage, holding that technological change "results from evolutionary recombinations of existing knowledge" (ibid, 4). For the purposes of this thesis, these concerns are beside the point because I am not assuming any of those features (increasing returns, inefficient outcomes and multiple equilibria) to be necessary for PD to arise, the rationale for which is provided in the previous and subsequent discussion when analyzing those respective features. In short, the MA is conceivable without assuming those features as necessary, but optional.

Speaking of features marking political life subjected to path dependent processes Pierson briefly lists them as:

1. *Multiple equilibria*. Under a set of initial conditions conducive to increasing returns, a number of outcomes – perhaps a wide range – are generally possible.
2. *Contingency*. Relatively small events, if they occur at the right moment, can have large and enduring consequences.
3. *A critical role for timing and sequencing*. In increasing returns processes, when an event occurs may be crucial. Because earlier parts of a sequence matter much more than later parts, an event that happens "too late" may have no effect, although it might have
been of great consequence if the timing had been different.
4. *Inertia*. Once an increasing returns process is established, positive feedback may lead to a single equilibrium. This equilibrium will in turn be resistant to change. (ibid, 263)

Institutional change in the theory of PD is brought into effect mediated by critical junctures. Critical junctures are important events happening early on in some sequence of

events which set off some process down a particular path. The assumption of increasing returns postulates that the advent of such critical junctures will be less likely in the later stages of a given sequence, but nevertheless they can occur if the conditions reinforcing and reproducing that path are weakened by some exogenous shock. In that sense critical junctures are compared to the notion of punctuated equilibria in paleontology, which serves the purpose of explaining the abrupt changes after long periods of inertia. At the initial stages of a sequence almost any event could take the role of a critical junction, depending on the many possible outcomes in a situation of non-increasing returns, but later on the pay-offs from it must outweigh the pay-off of changing the entire status quo. The question of what fosters critical junctures and thus brings institutional change into being has been addressed as an open problem in the literature and several solutions have been offered to deal with that puzzle, I am going to address them in the third chapter.

Employing PD in analyzing institutional configurations in a certain timeframe (e.g. the reasons why some institutions persist somewhere in spite of their inefficiency, why we see convergences or divergences where we would expect otherwise, etc.) can help us address the reasons for their continuation. For example, considering an entrenched monopoly or duopoly in some party system, detrimental to its political competition, could be explained by increasing returns of having an already developed institutional apparatus and network of influence, as opposed to considerable start-up costs, or answers to the particular cultural climate. That can help us understand why a change that could be viable at an earlier time is not in a period that exhibits increasing returns.

2.2. Problems with Pierson's application

There are a couple of issues with applying PD to politics. To begin with, there is a problem of potential infinite regress when trying to pick a starting point for the analysis because ever earlier events could be adduced as relevant for the development of some outcome. SA explains away this problem by recourse to its postulate of contingency and stochastic nature of initial conditions. But seriously involving the motto of broadly construed PD that "history matters" – in other words involving the analysis of events in their actual historical situations – makes the assumption of such radically conceived contingency inadequate because none of the proposed starting points (at any single level of analysis, be it individual or collective action of larger social entities) exist in vacuum and rely for their causal arising on further givens that reach more back in past. The purely probabilistic conception of the Polya urn is idealizing concrete reality too far to serve as a useful heuristic device for explaining it. For example, (Mahoney, 2006:133) mentions the commonly invoked case of QWERTY keyboard layout as a case of a contingent event occurring which runs in the face of theoretical predictions, and from the standpoint of the theory it is exogenous and therefore unexplained as though it is random. Its initial selection instead of some more efficient alternative was contingent, looked upon from the framework of mainstream economics. But what is overlooked is that at the time of selection there was no ordering of efficiency with regards to criteria that someone like August Dvorak, the creator of the Dvorak layout, later on studied with the intention of replacing what became perceived as the efficiency cost in QWERTY. At the time of selection there were no alternatives (no alternative keyboard layouts, although there were stenotype machines, but the lack of general awareness of their superiority still persists) which were known to be more efficient. And that makes the choice of QWERTY the only practical and expectable outcome. The event of its

conception was definitely contingent on the process that its creators were trying out but was not contingent in the sense of being randomly selected among multiple fully formed alternatives. Finally, the exact meaning of the notion of some event being contingent to the observer is not clear enough but prone to ambiguity. Is it contingent to a real observer or a hypothetical-idealized one? If the first is the case, what constitutes relevant observers, and should there be some ordering of importance among them? For example, are qualified observers lay people or only well-informed experts? In other instances, the notion is tweaked so as to contingency being theory, rather than observer-related; i.e., if the type of event is left out of some model as an exogenous variable. But then it must be asked, other things being equal, why we should not favor a theory that might explain some change endogenously, rather than exogenously? It seems that invoking theoretical or observer externality as criterion for a more reality-based notion of contingency is equally unsatisfactory because, in principle, it is always possible to find other theories which would take such an event as a probable or even necessary event, supposing some antecedents. Therefore, the notion of contingency as such seems to create more theoretical harm than good.

Another issue is the question by which mechanisms change happens even if positive feedback is not a means for a rigid and permanent lock in – such causes remain exogenous to the models used (Greener, 2005:64). One suggestion is that increasing returns do not happen by automatism but are cultivated by political actors through various means of mobilization and coalition building (Deeg, 2001:13). On the other hand, (Rixen and Viola, 2009:26) suggest that change admitted by PD processes are not to be conceptualized across different equilibria, but as a change in depth inside a particular point, thus mediating between stability and change.

Both of these problems are captured in (Mahoney, 2006) under his discussion of contingency (of the early events in a sequence) and determinism (of the later events). That

relationship of initial contingency and later determinism is termed by him to be the "central paradox" of PD, because the sequences thus characterized are at the same time unpredictable from the theoretical standpoint, but also necessary results of the variables used in the same theory. In his example from economics the origination of the inefficient paths is contradicting the prediction of the neoclassical economic theory and is therefore not fitted to it, but it is nevertheless explained by its mechanisms once already selected. Still, that "paradox" is only seeming in character because the inefficiency usually addressed is only applicable when looking counterfactually and compared to earlier possibilities of completely different paths, once the paths are established and increasing returns developed, the more efficient original option becomes the less efficient one because of its costs. Still, the entire framework of high contingency and determinism attracted criticism from other social scientists:

> Most notably, Thelen (1999, 2003) has argued that this formulation leads to too much contingency at the front end of sequences and too much determinism at the back end of sequences. She suggests that social scientists need to recognize that most sequences are characterized by more subtle processes of selection and reproduction, in which only parts of an institution may be selected for adoption, and in which reproduction is tied to processes of transformation. For example, on one level, the US Congress has been stably reproduced over time; on another level, however, the US Congress has undergone enormous change. Hence, it is unclear if this institution has been reinforced by an increasing returns process. (Ibid, 135).

Various aspects of the problems in this and the preceding chapter were noticed by different authors. The next chapter will review some prominent strains of development in theory of PD.

3. Further developments of the concept of path dependence

In this chapter I will review the proposed extensions (under 3.1) and revisions (under 3.2) of SA, which were developed with the purpose of accounting for change, along with the overall change in focus from deterministic conceptions of PD in economics to conceptions more permissive of change in political science and sociology. The developments in 3.1. are not engaging in conceptual engineering of PD as such, but are trying to provide an intelligible account of change in the face of the paradoxical situation arising under the constraints of SA. Their respective solutions to that paradoxical situation form their extensions and differences from it. In contrast, authors considered under 3.2. undertook a conscious effort to provide different definitions (while 3.2.2. and 3.2.3. even different frameworks) which would accommodate both the seemingly static character of SA as well as other notions of history-constrained change in the context of institutions in general. 3.2.1. and 3.2.3 took a very constrained interpretation of the concept as found in the groundwork laid by Arthur and David. But their reading of it rendered the discussed conditions of PD prescriptive, while Arthur and David had a descriptive theory, identifying certain mechanisms of PD without claiming that no other type could be possible. Nevertheless, both accounts omit some aspects of SA (the first increasing returns and multiple equilibria, the second contingency) and as such are steps in the right direction. 3.2.1. reinterprets the SA in a more permissive way. 3.2.2. provides an example of adducing a completely new theoretical underpinning in the discussion, 3.2.3. is engaging in conceptual rearrangement, trying to have the best of both worlds regarding SA and mechanisms found in the literature dealing with institutional change. All of these authors made significant contribution to the discussion and if not stated otherwise, I agree with their remarks on the matter.

3.1. Extensions

3.1.1. Contingency vs. chance, unchanging change and continued causality

(Martin 2012) offers a rejoinder to several critics of his published lecture on extending PD from a lock-in conception to an evolutionary one in economic geography. I am mentioning it here because it is useful in many respects. First, one of the critiques addresses that by extending SA backwards in time it opens the way to infinite regress. Martin replies that such criticism misses his position because he is not calling for such an extension in events, letting them to be characterized in the same vein as SA does, as accidents of history or events of chance, on account of lack of their anticipation or prediction. But, he states:

> contingent events need not be inexplicable. They are sometimes the result of the intersection or conjuncture of two or more circumstances or other events. This need not set off a search to explain in turn those 'conditioning' events, and thence the causes of these, and so on ad infinitum. (ibid, 186)

He then draws a distinction between contingency and chance in initial conditions, the former being properly taken as beyond the realm of explanation. On the other hand, what is seen from the point of view of some theoretical framework as an event of chance could be a product of some causal chains and their interaction.

Another aspect of his position is broadening PD to a range of different processes of incremental transformations, in contrast to the standard notion of locked-in state. His critic here proposes a peculiar notion of change which Martin then embraces:

> Simandan also suggests we can reconcile change and stability, by invoking a process philosophy perspective, in which 'stability' gets redefined as a situation where something (say a regional economy) keeps 'changing in the same way', whereas 'change' is where 'something [a regional economy] changes its way of changing' (2012: 174). (…) Adapting Simandan's terminology, regional economic stability would mean a constant unchanging form of transformation; whilst regional economic change would imply a changing form of transformation. If we accept this particular way of thinking about stability and change, the former

> might be interpreted as 'lock-in' to a path of 'stable change', and the latter as one of a path dependent 'developmental' (changing) change. (ibid, 189-190)

Last thing I want to mention here is Martin's note that it is possible for sequences of paths to be affected not only by the events placed early on in the sequences, but also by later, more recent elements which could result in preventing a locked-in entrenchment of some decision in a state of fixed stability, leading instead to more incremental and continual transformations and adaptations. Again, Martin does not elaborate how such continued causality of later events in paths should be reconciled with the overall picture of SA without it breaking completely from it.

3.1.2. Open path dependence and developmental view

(Ebbinghaus, 2005) discusses the question of how institutional change is possible under PD. He invokes a broader, non-deterministic sense of the term as conceived in the studies of historical institutionalism where it designates "the long-term developmental pathway of an institution, or complex institutional arrangement, shaped by and then further adapted by collective actors" (Ebbinghaus, 2005:14). Such actors find themselves to decide in a framework limited by institutions at force in former and contemporary times.

The crucial question here being in what way and intensity those past institutions or decisions lay out the possible options for taking current and future ones. The common abstract scheme depicts the development of PD by reference to critical junctures which in certain situations of crisis give birth to some new institutional relations, which are then self-reinforced through the process of institutionalization. The result of that process is that the possible alternative routes available for taking are then structured in accordance with what the certain entrenched institutions allow for. In such a sequence every element represents a

juncture for a possible departure but given the constraints of circumstances the changes will be more or less costly, with more radical changes being in general more costly than the gradual ones. This account is termed as the developmental view of PD and is taken as theoretically more adequate for accommodating for change, in contrast to SA. Under it, three possible cases for institutional development (or change) can be conceived.

First, at the minimal end of it, we can speak of path stabilization that manifests itself in marginal adaptation of the existing path to a change in conditions. Second, there might happen a path departure, which is characterized as a change conditioned by earlier elements in the sequence but not determined by them. Path departures are a hallmark of open PD which works through narrowing down of possible decisions. Some of the possible scenarios here are gradual reorientations over periods of time, functional transformations of the original purposes of some institutions, and layering of a new institution with divergent aims over an earlier one. The last case is a radical path switch or cessation in which the established path is overthrown through an arising of a critical juncture that opens the needed societal resources for bringing the change about.

After laying out these different cases Ebbinghaus goes on to propose a set of four social mechanisms that would serve to explain institutional inertia and change. The first one is marked by utilitarianism and operates on micro-level, where social actors align their decisions to those of others after they start perceiving it as brining about their own personal utility, producing a network effect where the more some convention is used, the more benefit to those involved. The second one is cornered in political institutionalism, which explains how certain institutions shape the framework for factionalist social and political interest groups. PD can arise in such a context through self-reinforcement of policies by those groups seeking to partake in that framework. The third mechanism comes from functionalist system theory and describes how institutions can form symbiotic relationships and become complementary,

supporting each other and thus enduring in a way neither could on its own. Finally, the fourth mechanism is studied by sociological institutionalism and deals with normative and psychological aspects of abiding to rules and following conventions, because certain institutions may persist because they become internalized for actors through socialization. Behaviors may be mimicked not because they are efficient but because they are seen as being legitimate or correct.

3.1.3. Self-reinforcement of an internal "logic"

(Deeg, 2001) asks on what grounds could we differentiate between innovation representing bounded change within an established institutional trajectory and the start of a new path. His position is that new paths never break of completely or radically but are evolutionary in nature "characterized by a hybridization process (not convergence) in which many of the institutions of the old path continue as before, some old institutions are transformed to new purposes, and new institutions are introduced" (ibid, 7). What distinguishes such new paths from the old ones is the underlying rationale, or what he calls a "logic", in his example "the incentive structures for key actors and patterns of strategic interaction among them" (ibid), "routine approaches to problems and shared decision rules that produce predictable patterns of behavior by actors" (ibid, 14). In contrast, a new path is one which exhibits adoption of a new "logic". He takes radical change to be the same as exogenous discontinuous change in terms of violent overturn of the ruling structures either by human agency or forces of nature. On the topic of contingency he broadly follows Mahoney, who takes contingent events to be unexplainable by looking to some earlier events because "they are either events too specific to be explained by prevailing theories, such as the assassination of a political leader or the specific choices of an individual, or they are large

random events like natural disasters or market crashes" (ibid, 9), but departs from him on account of finding this picture to be too restrictive. Deeg conceptualizes critical junctures as emerging from normal constrained processes of change inside a given path (ibid, 11). But more importantly, he holds that a change to a new path does not have to involve contingent events at all to be an instance of PD, because what we may perceive as contingent or insignificant events could actually depend on larger structural conditions, or straight-out big events, because "with each event in the sequence the probability of going back to [an earlier] situation (...) is less and less likely" (ibid, 35). Furthermore, he takes increasing returns or self-reinforcement as being able to both continue an old path and start a new one, due to the possibility of bifurcation in the old path which persists evolving along the same old lines, while the off-shot path develops new "logic", setting it off along a new path.

3.2. Revisions

3.2.1. Path dependence of contingency and self-reinforcement

(Vergne and Durand, 2010) provide a narrower definition of PD as a "property of a stochastic process which obtains under two conditions (contingency and self-reinforcement) and causes lock-in in the absence of exogenous shock" (ibid, 737), making it also applicable only to a smaller set of phenomena within the larger group exhibiting constructs about the relevance of history, which are: absorptive capacity, institutional persistence, resource accumulation, structural inertia, imprinting, first-mover advantage and chaos theory. All of them differ from each other on the strength of the influence which the initial conditions have, the type of triggering events, the type of mechanism sustaining the process, their outcomes and the degree of their predictability. They also generally assume that to achieve a lock-out it

is necessary to suppose an occurrence of an exogenous shock. Nevertheless, they are qualifying this with two considerations: the first being that self-reinforcement mechanisms may be of limited time-span, or limited validity depending on other variables, like in the example of economies of scale where after a certain point further rise in production will not push the cost down but pull it up instead, which provides an instance of endogenous path termination. On the other hand, it is possible for paths to take place in different contexts simultaneously, like institutions in different environments or firms in different industries. A local disruption or a lock-out in one of the contexts may trigger a global lock-out in all of the contexts that the path partakes in.

In the context relevant for political science, they talk of PD on a macro level, identifying institutions as its agents, while they find the main issue being the inefficiency of history stemming from institutional stickiness. To that they provide the example of organizations that help to perpetuate regulations favoring their own survival, despite their overall societal detriment or lack of efficiency (ibid, 738). They are critical of conceptualizing institutions as persistent patterns in society, together with PD as being that very persistence, which renders speaking of PD institutions redundant, and they ask what is PD adding on top of the underlying concept of institutions. Their own suggestion is to make a distinction between PD as a process (which they defined narrowly as we saw) and the outcome of that process (a lock-in). The conditions they proposed as necessary for PD are contingency and self-reinforcement. Contingent events are here taken in the sense of "unpredictable, non-purposive. and somewhat random events" (ibid, 741), which excludes the situations of the first-mover advantage from being an instance of PD. An example of it would be unexpected encounters among the individuals involved in some sequence of events or trial and error processes that result in unexpected consequences. The other condition is self-reinforcement, produced by mechanisms such positive or negative network externalities and increasing

returns, but they maintain that for self-reinforcement to arise it is necessary that at least one negative externality is present, which would make alternative paths less attractive, which means that something can be PD even without increasing returns. For example, in a situation where all the alternatives bear decreasing returns, but at different rates of speed resulting in a lock-in as a state with a minimal potential for endogenous change.[3]

3.2.2. Morphogenetic path dependence

(Greener, 2005) motivates his discussion by making an overview of some critical questions addressed towards PD, the first asking what the instrument of change in path dependent processes is and why do critical junctures arise; while the second inquiring into the status of ideas in PD, especially their potential to keep continuity in history. He proposes Archer's morphogenetic social theory as a general framework for elucidating PD. Elaborating on the levels of morphogenetic analysis Greener writes:

> "The morphogenetic approach divides analysis into three interrelated stages. The morphogenetic approach first analyses the structural and cultural 'conditionings' that act as an influence on human actors, and which create 'emergent properties' and 'situational logics' for their interactions with them (...) Second, it explores how these conditioning factors influence actors within the system through their interactions with them, primarily in the form of their behavior in vested interest groups. The third and final stage analyzes the result of these interactions, and the resulting conditioning effects that will feed into the next morphogenetic cycle." (ibid, 65)

[3] I would like to add here the cases of our current financial framework, which is staggering economic development according to many heterodox economists but persists because of societal inertia. Also, the entire way of running the economy based on growth is detrimental to the environment which becomes ever clearer as time passes, but a lot of entrenched interests are making the transition to some other mode of production impossible for the time being.

The first stage is to be analyzed according to its "emergent properties" which can be either necessary or contingent, in the sense that political actors either see themselves as being interdependent with their opponents or autonomous from them. Those properties can also be viewed as being compatible or incompatible with each other, this time in terms of their vested interests. Combining these characteristics yields a table that gives the likelihood of a group preserving its position as well as the likelihood of a conflict. The four possibilities and their likelihoods of PD are: necessary compatibilities (highest), necessary incompatibilities (medium to high), contingent compatibilities (low) and contingent incompatibilities (lowest). Thus, according to Greener, first possibility, termed "morphostatic", is the most conducive one for bringing PD about and the interaction of interdependence and compatibility are taken as a means for explaining the continuity of a certain system. Change on the other hand is the result of all other departures from that paradigmatic instance of stability. Most interestingly, he reasons that in the context of politics a situation of increasing returns cannot last indefinitely because once "it enters its reproduction phase (...) it seems unlikely that anything greater than the preservation of the status quo is possible" (ibid, 69), thus switching to constant returns. Because of that endogenous change is to be expected within path dependent processes in politics, resulting from the difficulty to keep stability in this context.

The first problem with this approach is the lack of worked-out relations between structural and cultural components in the first stage, i.e., how do the modal and compatibility aspects of each interact with the other and what implications does that bring? Developing that strain would complicate the theory because it is not straightforward what element – structural or cultural – holds more relevance for arising of path dependent situation and how would all of the possible combinations be interpreted. The second problem is that Greener is addressing only what (Dobusch and Schüßler, 2012) are referring to as structural inertia and co-

evolutionary lock-in, leaving other, more standard types of PD completely unaddressed in his framework.

3.2.3. Path dependence as self-reinforced change in depth

(Rixen and Viola, 2009) made their aim to address and get in order what they found as confusion, conceptual stretching and proliferation in the literature on PD as it was developing in appropriation by sociologists and political scientists. I will give more attention to their work here because they were the only ones in this literature who set out to provide the same sort of conceptual framework for PD as I did, but they did it on a set of opposite assumptions to mine: namely, that SA ought to be the paradigm for PD, while all the other uses in political science are to be treated as abuses of that technical term and should be seen as instances of different kinds of processes. Their position is that PD is properly used to describe only one of the processes of institutional change and that this proper usage of PD corresponds to its narrowest definition found in the groundwork laid out by Arthur and David, which consists of endogenously self-reinforcing processes. They hold that invoking PD in much of historical institutionalist analysis via stretching that original concept led to over-diagnosis of PD as a phenomenon when studying institutions and that all such cases in fact refer to other concepts of institutional change, for which they have developed a systematic taxonomy based on the idea of the ladder of abstraction. Nevertheless, their definition of PD is not found in its direct form in the work by those economists, although it could be argued that the properties they take as necessary and sufficient for characterizing PD are derivable from SA.

Citing Arthur they state that "the condition required for PD to occur is that a technology is subject to self-reinforcement, respectively positive feedback" (ibid, 6), and they recognize that Arthur and David use terms like "self-reinforcement", "positive feedback" and

"increasing returns" interchangeably. Nonetheless, they take that the first two apply only to endogenous processes and take the third one to capture the idea of reproducing outcomes, so that by their reconstructed definition PD depends on two conditions: endogeneity and reproduction. This is the first point I find problematic in their paper, because their usage of these terms they take to be key for their analysis is not consistent in their own work.

Their taxonomy differentiates between concepts on two distinct axes: on the vertical dimension it organizes categories on the level of abstraction at which they can be conceptualized, with the most abstract ones at the top, which are rich in range (extension) but poor in conceptual content (intension), and categories become ever more concrete as we follow the ladder down, until we reach the bottom that should only contain variables informed by individual cases. On the horizontal dimension it covers all the conceivable causes of institutional change. These causes are analytically discrete although in practice they may yield joint effects. Their ladder has four distinct levels, each of which is more concrete than the former. The first level is made from an exhaustive dichotomy concerning institutional dynamics, i.e., institutions can exhibit a change, or not. Change itself is divided to pace of change and sources of change, and the latter one is the focus of their further divisions, even though the former, the measurement of change (e.g., gradual or fast) is often taken to be a mark of PD (as slow, incremental change). Sources of change are further divided to exogenous and endogenous sources, but also to a distinct source which takes the interaction effect of the two. Endogeneity here refers to the change having its source within the institutional framework that undergoes the change, by means of creating a feedback or a loop in which earlier events in the process extend their influence on the latter ones, while exogeneity means that the source came from outside the institution in the form of some other societal or natural agents (here, for example, they place the idea of critical junctures). Both categories are merely functional, and the same variables could take on either of them with

respect to different contexts or by passing of time (if an initially exogenous impulse of change becomes co-opted or implemented inside the institution). On the third level both categories are divided into three processes: (self-)enforcement, (self-)reinforcement and (self-) undermining, with un-prefixed processes belonging to exogenous and the prefixed to endogenous categories. All of them are conceptualized in relation to types of returns that characterize them: (self-)enforcement is brought by constant returns, which means that there is a positive linear relationship between the variable causing the change and the institution in question, and those kinds of processes refer to bringing a state of equilibrium about, while the institutional change differs in what type of movement is analyzed: a creation of an institution *ex nihilo* or a change from one institution to another. (Self-)reinforcement deals with institutional reproduction and it is generated by process of increasing returns, affecting the stability of an institution. The last one, (self-)undermining is characterized by decreasing returns and the change is here brought about because the institution becomes less and less effective (ibid, 14-19). The last level of the ladder encompasses some of the examples that the authors chose to illustrate the concepts in the third level. They hold that the "spatial" dimension represented in their taxonomy is oftentimes confused with the temporal dimension of change in which it can occur rapidly or gradually when other authors in the literature take PD to designate both the pace of change as well as its nature, e.g., reinforcement of a particular path rather than switching to another one. Their point, finally, is that PD should not be taken as a concept that designates unchangeable processes, but as reflecting a change which is happening within a particular equilibrium

> "that is a change in depth or space, rather than a change across equilibria. Because the change is one of institutional depth, it can easily be misread as non-change. Thus, stability need not mean non-change, but can instead refer to the fragility of a particular equilibrium, the extent to which it is embedded" (ibid, 25).

Although I value the conceptual clarity they attained and am indebted to them with certain divisions of my own abstract scheme, I have multiple issues with their analysis of the literature, account of PD, criterion posed for something to qualify as a PD process and the taxonomy of institutional change they offer. In the beginning of their paper, they term those conditions to be endogeneity and self-reinforcement, and they use the same terms when presenting and discussing their taxonomy, but the conditions in the crucial part of the paper dealing with distilling these features from the original work on the concept are endogeneity and reproduction. And the problem is that neither of the two will do for either what they aim for or what a good definition should be like. The first issue is that reproduction and self-reinforcement do not designate the same idea. If they meant that reproduction as such when combined with endogeneity is enough for qualifying something as PD then their taxonomy should include both self-enforcing and self-reinforcing processes as PD, but that is exactly what they want to avoid, tying up PD with increasing returns. But on the other hand taking endogeneity and self-reinforcement as two distinct conditions for PD fails, not on account of being too broad, but on account of those two conditions not being independent of each other, as the latter is a subset of the former, which means that saying something is "endogenously self-reinforcing" is redundant, for exogenous self-reproduction would be a contradiction in terms. In their second paper (Rixen and Viola, 2015) they silently acknowledge this by changing the talk from conditions to "core attributes" of only one condition, which they now take to be self-reinforcement, characterized by the attributes of increasing returns and endogeneity (ibid, 305).

Furthermore, on the side of conceptual makings of PD, they never gave any independent argument supporting their decision to treat only the narrowest conception of PD as the only valid one, except stating that this particular conception was the first one elucidated and systematically worked out when PD started to be studied as a phenomenon. There are many

examples from the history of science when a concept first brought in one form was calibrated afterwards until it reached a mature stage in which it served its explanatory role and there is no *a priori* reason to suppose the same could not be the case with PD. Additionally, the authors here are making the fallacy of presupposing what should be established when they criticize other contributors in the literature for the extensions to the concept they produced, on the basis that those extensions are inconsistent with PD because that term should only designate self-reinforcing processes. Surely, one might find arguments serving to establish such a thesis, but they should be of conceptual nature, waging the definition in a process of reflective equilibrium, seeking to establish whether the scope of the concept is validly confined to certain parameters. There is no reason provided for the claim that situations of increasing returns in exogenous cases should not count as PD. It is possible to conceive a situation of increasing returns where exogenous reinforcing processes could be admitted to be PD: imagine members of some institution are taking bribes – and in that capacity operating as private persons outside the confinements of the institution – and diminishing the role of their institution, which makes it easier for later bribes to take place and diminish it even more, and so on. In the long run it will become more effective to rely on corruption to evade the rules that the institution should be securing, and it would become a new rule to just pay some standardized fee to circumvent the original forbiddance. Or, another example, a crime gang could assassinate the judges trying to prosecute them, until future judges stop doing so out of fear, being locked-in in the belief that every judge prosecuting that group will be killed. Intuitively, it is justified to say that their current decisions are resting on the past events more than the present, although they are exogenous and not even self-reinforcing in the sense that the same process is caught in an ever-growing loop.

Given that they did not give a grounded account of criteria for PD, their critique of other authors is without potency, but it also misses the point of those extensions, which were

developed to provide a dynamic account of PD in the context of sociology and political science. Saying that every change is exogenous to PD processes is also unnecessarily limiting the potential for endogenous path cessation in processes that reach a "wall" in their unfolding which would hinder their increasing returns and could open up the way for a lock-out. Again, PD does not need to be increasing in returns, as we saw when discussing Vergne and Durand's paper. Furthermore, we can psychologically motivate an account of change based on the relative satisfaction with some processes on account of its ever more efficient development. In such a case, the observed halting or falling in the rate of improvement could be a source of frustration with the underlying mechanism of that process, and a reason for its abandonment in favor of one that would be even more efficient. For example, say we have an institution that delivers some benefit on the basis of 10% increase of the last state per year. After 10 years of compounding, the rate acquires linearity, which would be perceived as a loss compared with the previous stage. After 10 years of doing so, the rate starts to fall each year by 1%. Finally, in the fourth decade the rate reaches its last stage, yielding a 1% constant increase indefinitely. Suppose now that this institution is the optimal one – given some unchangeable restrictions – but that the majority of the population is not aware of that. We still have a situation of increasing returns here, but it is easy to imagine a disappointed population changing the institution because the returns are not increasing *enough* from their point of view. So, we see that PD does not have to depend either on endogeneity or increasing returns. We can have it both reinforced and weakened by endogenous and exogenous factors, increasing, constant, and decreasing returns.

In the end, what they are describing with parts of their taxonomy as instances of change are not such, as is not the one that they are taking as being the paradigmatic for PD – self-reinforcement. The problem of how change occurs in situations in which history exerts its influence on the present, i.e., how are some processes capable of breaking away from that

influence is not in any way solved by stating that the only possible change in PD processes is the change towards *more* PD, or more of the same. That is only ignoring the issue at hand. The change in depth or breadth of an institution, i.e., strengthening a current equilibrium, qualifies only for a change in degree, which is not the kind of change we are interested in this discussion.

I take that all of the processes mentioned by Rixen and Viola's taxonomy can be instances of PD. But I do not take any of them individually as a necessary condition of it. Also, processes of layering, conversion, displacement and drift developed by other authors in the literature like (Thelen, 2003) are also hereby vindicated as possible instances of PD, although none of them needs to be such.

4. The framework of the Minimal Account of path dependence

4.1. Motivation for a new framework

Bearing in mind the discussion in this thesis it may be observed that PD, as standardly defined, cannot stand the test of closer scrutiny. The standard definition omits a lot of plausible PD phenomena and in a very strict sense permits none. Among the extended definitions, it is apparent that a lot of mutually unrelated and conflicting conceptions of PD can be found in the literature, e.g. being true only of stochastic processes and initially contingent events or not, having lock-ins or not, having endogenous options for lock-outs or not, being gradual in change or not, being true only of processes exhibiting increasing returns or not, being true only of agent-based actions or not. It is therefore needed to engage in conceptual engineering to devise a more appropriate one. On that basis, I will start by postulating that PD is not intrinsically connected to any particular notion of stability or change, but is instead a mode of conditioning events that are taking place.

Laying the ground for my definition I am here following a couple of authors in their broad approach. First, I am trying to accommodate encompassing concepts of PD such as the definition offered by (Vinscensini, 2001) in which ""history matters" because of legacies and also because of strategic path shaping actions that influence the process of institutional change" and specifically for the context of political science "institutional PD, understood as a historical cumulative process of evolution constrained by legacies and influenced by strategic actions leading to possibly locked-in but not necessarily inefficient situations" (ibid. 11).

It also vindicates the approach taken in (Kay, 2005) in which PD institutions are constrained by policy paradigms made of ideological and technical components that serve as frameworks in the process of policymaking (ibid. 564). Furthermore, (Federowitz, 2000)

conceptualizes institutional change as at least partially mediated by anticipation, i.e., by future-oriented beliefs or expectations which influence the behavior of agents and foster change through, metaphorically speaking, reward or punishment. He holds that such anticipations can explain path-breaking even where there is an established lock-in.

Lastly, I follow (Mahoney, 2006) in taking PD as having many different types, among others increasing returns, structural inertia, co-evolutionary lock-in, reactive sequences, etc.

4.2. The Minimal account

Trying to ground all those aspects I am positing that the defining characteristic of PD processes is the influence of past circumstances on the viability of present possibilities, or stated subjectively, the influence of past circumstances on the ordering of agents' preferences, regardless of whether the function representing some process may behave concavely, with initial reinforcement and mature-stage enforcement, or with an explosion of positive-feedback, or even self-undermining. The dimensions that can describe PD situations, i.e., their source, direction, the rate of change in the direction, their outcomes, the manner of their establishment or cessation and the relationship between the *ex ante* and *ex post* rationality in their analysis can take different values.[4]

[4] These dimensions are derived from different possible aspects of a path dependent process, formulated as respective answers to the questions such as: What was the cause of PD? Is the influence of past events narrowing or expanding the set of possible outcomes in the current latest stage of the process? Is that influence increasing, decreasing or remaining constant? Is it constituting a lock-in of some sort or not? Was that influence established/disestablished gradually or rapidly? Are choice optimum points of theoretical (*ex ante*) cost-benefit analysis the same as the actual (*ex post*) ones or do they diverge, i.e. is the likelihood of reaching an optimum point lower, higher or the same on account of PD?

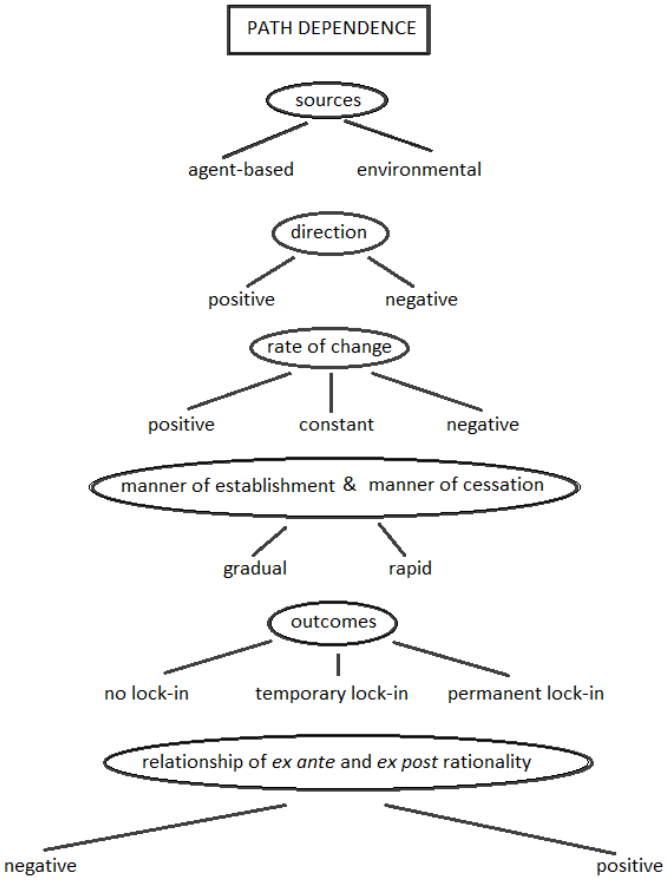

Figure 1, The six dimensions of PD

The sources can be conceptualized in a continuum between the two extremes from purely agent-based PD on the one end in which future outcomes are completely constrained by past and are deemed worthy solely on their basis of being aligned with the past (rigid unreflected traditionalism), to the purely environment-based end in which PD holds over some sequence of events because some external force exerted itself and brought about a lasting change (e.g. the submerging of 94% of the continent of Zealandia more than a 100 million years ago to the evolutionary history of species once inhabiting it). Regarding the societal and political plurality, the distinction between endogenous and exogenous factors are context-dependent: what is endogenous to some agents (or environments and environmental forces) may be exogenous to others. So, one group's endogeneity will be others' exogeneity. I follow (Garud et al., 2010) on this:

> "(…) what is exogenous and what is endogenous is not given, but instead depends on how actors draw and redraw their boundaries. Emergent situations are not 'contingencies', but instead afford embedded actors the possibilities to pursue certain courses of action while making others more difficult to pursue. Self-reinforcing mechanisms do not just exist, but instead are cultivated." (Garud et al., 2010:769)

Having that in mind, various imaginable combinations may take place. An initial environmental exogenous factor may divert the development of some society in a particularly constrained way, in response to which the societal forces may come up with a technology they would not have come up with in the absence of those constraints, which sets of an endogenous agent-base change in their further development, which in terms of its complexity may have some unforeseen emergent properties which can trigger an exogenous agent-based change, which could further bring an endogenous environmental change, and so on.

The direction a PD process may be only positive or negative, because PD is defined as a certain influence of past circumstances and they can constrain later events only positively or negatively, i.e. they can be either conductive and permitting or detrimental and opposed to a certain development (a neutral influence is no influence at all). On the other hand, the rate of change of that influence can be positive, negative or constant, as exhibited by reinforcement, undermining, or enforcement (which might be endogenous – e.g., self-reinforcement, exogenous – other-reinforcement, or both – mutual-reinforcement) as, for example, brought by respectively as increasing, decreasing, or constant returns.

Regarding the manner of establishment or cessation, it can be gradual or rapid, in accord with two types of change – change in degree and change in kind. I address the issue of change in path dependent processes in those two ways, the former of which may bring about the latter after sufficient compounded effects emerge which can lead to policy shifts in the long run. Such a change will be seen as gradual. Changes in degree can be both agent-based and environmental, as well as endogenous and exogenous, and can be both gradual and

abrupt. Changes in kind can also take both temporal characteristics. If environmental, they will always be exogenous to agents, but may be endogenous to the environment variables which carried the process of enforcement or reinforcement, although it may be exogenous to them too. On the other hand, agent-based changes will be endogenous either to the whole of the group in consideration (the one instrumental to a PD process), or to parts of it. In the case of there being another preceding group that triggered PD and was replaced with a later group which inherited it, the nature of the process may be said to be exogenous to that group if it did not inherit or internalize the "logic" which carries the process.

Considering the outcomes of PD sequences, a lock-in can be understood in this framework either as temporary or permanent. A temporary lock-in may be surpassed endogenously when the source of increasing returns wears off and can be best understood in the context of a cost-benefit analysis as an added weight on a certain option. A permanent lock-in cannot be surpassed endogenously and a situation resulting in it is bound to it as long as it is dependent on the same set of structural constraints. On the other hand, a PD situation need not enter either of those locked-in states because it might end before it reaches one.

The last and key dimension is the one in which we examine decisions of rational agents in a certain context, which refer only to those processes for which choice optima points depend more on some constraints developed during time, than on the purely abstract cost-benefit analysis. So, although what is rational now under certain assumptions may coincide with what was rational at some earlier time, they tend to diverge when certain structural changes take place. PD bounds rationality not only through the status of preferences (constant or not) but also by changing environmental factors. In this sense, a broader phenomenon which path-dependence is an instance of is structural dependence. PD situations are structurally dependent outcomes of some historical processes, whereas there are also structurally dependent situations which are themselves not outcomes of historical processes,

but of some universal properties of physics, chemistry or biology for example. Some outcome can be the most efficient in theory, but in practice PD on conditions brought about by non-necessary historical events. Such an outcome would be sought by rational agents if it was available but could not have been until the conditions for it came into being. This also means that in a certain sequence of events where changing conditions obtain, something that was a theoretical optimum in an early state of the sequence does not have to be a theoretical optimum later, because more and better possibilities might emerge. In other cases, what is rational and what is theoretically most efficient will diverge. This type of cases is prevalent in what interests us about PD because the former, so to speak, obtains automatically whenever sufficient conditions arise, while the latter needs a change in existing conditions. To reiterate differently: all discussions of interesting examples of PD up to now were concerned only with the prospects of reaching sub-optimal outcomes in the context of the divergence of *ex ante* and *ex post* rationality, while we can see here that there is also a possibility of super-optimal outcomes, i.e., outcomes that were not obtainable under original conditions by the route of choosing the original theoretical optimum, but becomes obtainable after a certain series of sub-optimal choices the joint effect of which can expand the set of possibilities and brings about new optima points.

I will try to illustrate this possibility with an example. Suppose that a crude hedonistic interpretation of positive utilitarianism is true of human psychology in a way that implies that maximal number of people would live maximally satisfied in some sort of "pleasure boxes" where they would spend their lives neurally connected to a machine optimizing their levels of various pleasure and stress hormones. Starting from the conditions present today, the efficient way of achieving such a state for humanity would be to concentrate efforts and resources on that specific goal and its technological prerequisites. Another conceivably possible but sub-optimal way to achieve that could be to pursue other goals which could have accidental

consequences that bring about the prerequisites for that scenario. Then, such a possibility could become exercised by some groups of people on account of their affluence before, after some time, something like that becomes more broadly available. Given that living in a "pleasure box" would be seen as an ultimate superior good, everyone who could afford of doing so would ultimately do so and such mode of living would eventually generally become deemed as the only way of life worth living. A couple of other examples are here to illustrate the usual scenario regarding sub-optimal outcomes. Say that if evaluating anarcho-primitivist claims in a utilitarian framework we conclude, after running the totality of all imaginable costs, that a hunter-gatherer lifestyle is the optimal one for humans in regard to having the least number of pathologies and the greatest number of relative (however absolutely small) benefits concerning individual, societal and maybe even environmental-systemic wellbeing. It would still be possible that, although such a mode of consumption would be superior from the standpoint of some initial pre-agricultural conditions, now it is far less desirable, or even outright disastrous, even if possible to achieve. Or, in the case of some domesticated animals, although their overall wellbeing could have been better if they were never domesticated but left to their adapted fitness, now after a couple of thousands of years, genetically and behaviorally changed as they are they may not be able to attain re-wilding needed for survival in an environment they don't have instincts for. Or, to take a more trivial example, telling the truth about something could be a more effective strategy for attaining some goal, yet after committing to a certain set of lies, it may be that the same would be attainable at a much greater cost, if at all, after coming clean.

Theoretical issues boggling the discussion around PD that are resolved by this framework are:

a) Inapplicability to real world – as no idealized assumptions are core to this account (e.g. stochasticity of the process at hand, contingency, multiple equilibria) it translates

to empirical situations directly. *A fortiori*, given that all historical events are PD in the broader uninteresting sense of the term, the analyst just has to focus on explicating the six dimensions of PD to see if the interesting aspects obtain in a particular situation (the narrowing or broadening of the set of possible outcomes relative to past events exhibiting the same "logic", divergence of ex ante and ex post rationality and lock-ins).

b) Infinite regress – it is trivial that all current events depend on past ones, but the search for a starting point of some PD sequence of events is always bound by the "logic" of a sequence exhibiting interesting PD properties such as the divergence of theoretical (or *ex-ante*) and practical (e*x-post*) choice optima. When such a "logic" changes in a given sequence, the dependence on that particular path ceases. The same goes for the creation of a path, the starting point of which is bounded by some "logic" in the same way.

c) Acceptance of a broad range of intuitively acceptable cases – there is no seemingly arbitrary decision dividing narrowly defined PD processes and similar ones where history matters. Processes exhibiting various features like increasing, decreasing or constant returns can all be equivalently situated in this framework.

d) Tension between lock-ins and change – the state of being locked-in and the ability to change some institutions or their aspects endogenously are mutually exclusive in the SA. However, viewing PD as (i) not necessarily connected to situations of increasing returns, and (ii) the sources of PD as being comprised from both agent (who can be in conflicting relations) and environmental factors opens the space for different possibilities of change to be accounted for.

Conclusion

The aim of this thesis was to point out the problems with SA which make it impossible to use for analysis of the real world; to address those problems and review the work of political scientists who adapted the concept for their needs; to critically assess those adaptations; and finally, to contribute to the discussion with conceptual development proposing MA as a broad framework for conceiving PD.

The crux of this thesis is the claim that PD ought to be conceptualized in a looser manner than the SA - i.e. without the postulation of multiple equivalent equilibria, contingency, stochasticity, necessary lock-ins, increasing returns, exclusively negative direction or agent-based actions as the only source of PD - making it possible for societal processes to be analyzed from perspective of PD if they satisfy the condition that the range and/or likelihood of possibilities coming later in a given process is shaped more by earlier events than the current ones, which would allow the cost-benefit analysis employed in the questions of their optimal outcomes to be constrained by their history. I tried to provide a definition grounded in the ordinary use of language, encompassing the most simple intuitions of the concept: that PD is a trait of processes in which later states in a given sequence are influenced by the earlier ones in such a way that some otherwise possible outcomes are rendered improbable or even impossible on the strength of those earlier states, or on the other hand that some otherwise impossible or improbable outcomes are made possible and more likely. Nothing more than this is assumed for the purpose of establishing a general definition. On the other hand, the general framework developed in this thesis, serving as the grounding for the definition, aims to provide an exhaustive taxonomy at the most abstract level of analysis in which the six dimensions or aspects of PD processes can be situated.

Appendix 1: A note on methodology

As we saw from engaging with the literature, a lot of emphasis has been put on the demand for providing conceptual clarity of the concept at hand and a lot of accusations of conceptual stretching have been raised, with the consequence of trying to delineate the crux of PD as a specific phenomenon from other processes exhibited in accounting for influence of the past on present. In such endeavors, PD is tied with specific traits of historical influences, such as increasing, but not decreasing or constant returns. I have found this quest to be counterproductive in terms of lexical clarity. Although it is perfectly valid to define and redefine terms as one pleases - as long as it is done consistently and systematically - the practice of taking a term and narrowing its range of applications to only one of its proper subsets creates more confusion than qualifying those subsets with further specification. Because of that I am taking PD to range over all forms of historical influence that could be subsumed under it from the point of view of 'disciplinary language'. By that I mean what is in philosophy known as ordinary language approach[5], but applied in the context of a particular discipline and its discourse – so, I am trying to see how a certain term is used in a certain discipline. On the other hand, considerably altering the content of an established term is definitely invalid, no matter how mal-named it may be. But this is not the case here, because a lot of literature is dedicated to establishing conceptual boundaries of PD without an emerging consensus. So, with that in mind, my goal here is to provide the notion of PD a fitting (not too narrow, not too wide) conceptualization in line with its use in the studies that employ it.

[5] Ordinary language philosophy was inspired by Ludwig Wittgenstein's treatment of philosophical issues in his late phase, particularly in *Philosophical Investigations*. The main tenets of his analysis were the notions (I) that good philosophy is purely descriptive and its task consists in establishing how the terms under analysis are generally used, and (II) that all the major philosophical ideas and theories stem from philosophers' violating the bounds held by the ordinary usage of terms – culminating in a position that philosophers (as philosophers) should merely be engaged in elucidating activity rather than constructing any theories of their own. A "school" was subsequently formed in Oxford on this basis by the likes of Gilbert Ryle, P. F. Strawson, J. L. Austin, Paul Grice and Friedrich Waismann.

Lastly, given my task here is normative (in the sense of dealing with what the definition of the concept of PD ought to be, if it is to be a coherent and useful concept) and delves in a theoretical subject, the most appropriate manner for evaluating intuitions regarding what can be an acceptable definition, or an adequate content of a concept, is employment of thought experiments and abstract counterexamples. Even if the consequence of an adequate definition is that no PD phenomena are (yet) to be found in the world, it should be accepted on account of its adequacy. For this reason, I mostly left the important job of finding empirical instances of PD out of my scope.

Appendix 2: An example of describing path dependence

To illustrate some of the possible configurations of PD allowed by this framework I will invoke an example from a real world process lasting for more than two and a half centuries. The process consists of an interplay of industrial, societal and environmental developments which triggered climate change and a wave of extinction events across plant and animal kingdoms. We can in the first instance talk of a positive self-reinforced endogenous industrial agent-based PD which broadened the set of possibilities for human influences on eco-systems and climate in general. That resulted in a development of a globalized interconnected civilization of competing nations that existentially depends on those specific industrial mechanisms and their results. Here we can talk of mutual-reinforcement in a race to the top. Each of those nations is trying to grow their economies as big and as fast as possible, resulting in a positive agent-based influence on the environment, changing it in a way that earlier equilibrium points across eco-systems destabilized in a way economists would usually call a deadweight loss. Furthermore, the ideological entrenching encompassing the current mode of production, viewed as a necessary condition of maintaining its smooth and efficient run, is manifested in institutionalization of the free market paradigm in the economy and constitutes a negative PD regarding the capabilities of various societies and their governments for serious state regulation. Given that a global scale direct action is lacking for several decades now (breaching ever newer deadlines for thresholds of ever deadlier projections), while the trajectory extrapolated from the current trends indicates a continuation of harmful anthropogenic influences on climate, it is very likely that the current ecological deterioration will be further exacerbated and propelled, resulting in a permanent lock-in (regarding a time-frame relevant for humanity) of a fairly rapid negative PD scenario in which the environmental factors will take the lead role in shaping the space of possibilities

for human existence, making its processes endogenous (exogenous to humanity) and diminishing human-based agency for influencing further changes, but also radically diminishing the space of possibilities for societal well-being. Eventually, in terms of some geologically adequate timeframe the effects of human actions will diminish either through naturally occurring climate processes or the cumulative adaption of the biosphere to those environmental constrains, ending the "logic" of that path along with the dependence of it to the events in our 19th century.

Bibliography

Arthur, B. "Competing Technologies, Increasing Returns, and Lock-In by Historical Events." *Economic Journal* 99 (1989): 116–31.

Ball, L. M. (2009). "Hysteresis in Unemployment: Old and New Evidence" Working Paper 14818, National Bureau Of Economic Research, 1050 Massachusetts Avenue Cambridge, MA. http://www.nber.org/papers/w14818 (March, 2023).

Bennett, A, Elman, C. (2006). "Complex Causal Relations and Case Study Methods: The Example of PD", *Political Analysis*, 14(3), 250-267.

Boas, T. C. (2007). "Conceptualizing continuity and change: the composite-standard model of path dependence", *Journal of Theoretical Politics* 19(1), 33-54.

David, P. "Clio and the Economics of QWERTY." *American Economic Review, Papers and Proceedings* 75 (1985): 332–337.

Deeg, R. (2001). "Institutional Change and the Uses and Limits of Path Dependency: The Case of German Finance", *MPIfG Discussion Paper*, No. 01/6, Max Planck Institute for the Study of Societies, Cologne.

Dobusch, L., & Schüßler, E. (2012). "Theorizing Path Dependence: a review of positive feedback mechanisms in technology markets, regional clusters, and organizations", *Industrial and Corporate Change*, 22(3), 617–647.

Ebbinghaus, B. (2005). "Can Path Dependence Explain Institutional Change? Two Approaches Applied to Welfare State Reform", *MPIfG Discussion Paper*, No. 05/2, Max Planck Institute for the Study of Societies, Cologne.

Federowicz, M. (2000). Anticipated Institutions: The Power of Path-Finding Expectations, in Michel Dobry (Ed.), *Democratic and Capitalist Transitions in Eastern Europe:*

Lessons for the Social Sciences, Dordrecht: Springer Science+Business Media, 91-106.

Greener, I. (2005). "The Potential of Path Dependence in Political Studies", *Politics,* 25(1), 62-72.

Kay, A. (2005). "A Critique of the Use of Path Dependency in Policy Studies". *Public Administration,* 83(3), 553–571.

Liebowitz, S.J.,, Margolis. S. E. (1995). "Path Dependence, Lock-In, and History", *Journal of Law, Economics, and Organization* 11, 204-26.

Mahoney J. (2006) "Analyzing Path Dependence: Lessons from the Social Sciences". In: Wimmer A., Kössler R. (eds) *Understanding Change*. Palgrave Macmillan, London. 129-139.

Martin, R. (2012). "(Re)Placing Path Dependence: A Response to the Debate", *International Journal of Urban and Regional Research,* 36(1), 179-192.

Pierson, P. (2000). "Increasing Returns, Path Dependence, and the Study of Politics", *The American Political Science Review,* 94(2), 251-267.

Puffert, D. (2008). "Path Dependence". *EH.Net Encyclopedia,* edited by Robert Whaples. http://eh.net/encyclopedia/path-dependence/, (May, 2021.)

Garud, R., Kumaraswamy, A., Karnøe, P. (2010) "Path Dependence or Path Creation?", *Journal of Management Studies* 47(4), 760-774.

Rixen, T., Viola, L. A. (2009). "Uses and Abuses of the Concept of Path Dependence: Notes toward a Clearer Theory of Institutional Change", paper prepared for presentation at the *International Summer School on the Logic of Self-reinforcing Processes in Organizations, Networks, and Markets*, Freie Universität Berlin.

Rixen, T., Viola, L. A. (2015). "Putting Path Dependence in its place: toward a Taxonomy of institutional change, *Journal of Theoretical Politics,* 27(2), 301-323.

Thelen, K. (2003). "How Institutions Evolve: Insights from Comparative Historical Analysis", in J. Mahoney & D. Rueschemeyer (Eds.) *Comparative Historical Analysis in the Social Science,* Cambridge: Cambridge University Press, 208-240.

Vergne, J. P., Durand, R. (2010). "The Missing Link Between the Theory and Empirics of Path Dependence: Conceptual Clarification, Testability Issue, and Methodological Implications", *Journal of Management Studies*, 47(4), 736-759.

Vincensini, C. (2001). "Is Path dependence a useful concept to analyse the evolution of ownership structures in Central Europe? A theoretical and empirical discussion", paper prepared for the conference *Institutions in Transition* organised by IMAD, Otocec, Slovenia.