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Confronting total systemic failure? The May 2018 truckers' strike in Brazil

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Abstract

In May 2018, truckers in Brazil went on strike for 10 days to protest against rising diesel prices and for better freight payments. The strike caused an unprecedented level of disruption in many supply-and-distribution networks affecting almost all sectors of the economy and the society. Using causal loop diagrams (CLDs) within a systemic-inquiry approach, an analysis of the circumstances that led to the strike and the resulting systemic failures is developed. Although the main driver of the strike was the fuel-price policy of Petrobras, a semi-public Brazilian corporation in the petroleum industry, the level of the observed disruption was primarily the result of a cascade of failures in a range of coupled systems. From the circumstances that led to the strike and its disruptive effects, lessons for future policy are reported making evident the need for transformative governance arrangements, particularly innovative governance practices to prevent failure and disruption in highly interconnected systems.

Keywords: policymaking; systemic failure; systemic governance; truckers' strike

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1 INTRODUCTION—THE TRUCKERS' STRIKE

On May 21, 2018, in many parts of Brazil, truckers¹ went on strike to protest against rising fuel (diesel) prices and for better freight payments. In the course of a day, the strike assumed a national dimension with truckers paralysing activities in all states and in the Federal District. By its second day, the strike started to cause severe disruption in many supply-and-distribution networks. Blocking roads for trucks, sometimes violently, truckers hindered the distribution of essential goods such as food, fuel, medicines and supplies for hospitals (the distribution of medical care items was later allowed), and chemicals for drinking water treatment. Airports faced major operational difficulties, and factories were closed due to lack of raw materials and spare parts. In the rural sector, the strike hindered the distribution of animal feed causing the death of millions of chickens and threatened to kill up to a billion more as well as 20 million pigs.² Because transport to dairies was not possible, millions of litres of milk were thrown away each day. Also, due to diminishing stocks of fuel, public transportation systems in several major cities and state capitals worked only partially, with negative effects on trade and industry, bringing the whole economy almost to a stop and the country near to a state of emergency with extreme social disruption.

As the strike gained strength, receiving increased support from the population, concern about the risk that the country could undergo a “total systemic failure” also increased. Concern was exacerbated because regulatory systems at different levels of government, foremost the federal, were themselves showing failure to respond to the strike and to its effects. As a consequence, some conservative forces took the opportunity to

claim that a military intervention in the country would be necessary, creating the circumstances and increasing the risk of a (military) coup. After the federal government made several concessions by promising to lower and then freeze the diesel prices for at least 60 days as well as enforcing a whole range of benefits for the truckers, the strike slowly lost strength and finished after 10 days,³ albeit not without the intervention of security forces all over the country to ensure the distribution of fuel (at that time almost all petrol stations in the country ran dry).

The truckers' strike was not only unexpected but also a unique situation of disruption in Brazil. Therefore, an attempt is made to reflect on how the strike almost led the country towards a “total systemic failure” with significant levels of disruption. Systemic failure is common in highly interconnected systems, and it is mostly unpredictable. So it is important to understand the circumstances in which it happens to develop governance mechanisms that may help prevent its occurrence. Thus, from a governance perspective, could the strike have been avoided or its impacts minimized? To prevent systemic failure in future what designs to improve the governance of highly complex and interdependent “critical infrastructure systems” can be pursued? Shedding some light on the situation that led to the strike and on the fragilities resulting from highly coupled systems can perhaps contribute to the design of regulatory systems to respond effectively to future disruptive events. Further, by drawing some lessons from the strike, policies that minimize systemic failure occurrence may be designed, helping to address the pressing need for new systems of governance.

The remainder of the paper is organized as follows. After reviewing briefly the main features of systemic failures, causal loop diagrams are used to explore the causes and consequences of the strike. These diagrams also show how the responses to the strike may lead, in highly connected and interdependent systems, to more failure. The need to design and implement innovative policies to transform current governance practices, reducing failure vulnerability and disruption potential, is also discussed. The paper finishes by making the point that thinking and acting systemically has potential for reducing the occurrence of systemic failure as well as facilitating actions to cope with its consequences.

2 CHARACTERIZING SYSTEMIC FAILURE⁴

Systemic failures are relatively common. They happen all the time and may occur under a wide range of practice situations, in the public and in the private sector, with different intensities and distinct levels of severity. As claimed by Ison (2017) “there are seemingly no shortage of situations in which failing to think and act systemically leads to breakdown or some form of failure.” Systemic failures are “on-going.” Naughton and Peters (1976), cited by Fortune & Peters, (1995) define systems failures as those failures arising from sets of related activities or, in other words, from systems. In a way this understanding of failure builds upon the idea of purpose, because the purpose of a system is what it does (Beer, 1985). Thus, it can be assumed that whenever a system is not producing the expected or desired outcomes—the results of what it does—then some form of failure is occurring. After all, if the system is not doing what it is supposed to do—when it is not fulfilling its purpose—it is failing. During the strike, many of the systems affected by it were showing this failure behaviour.

Garnett (2018) in his considerations about systemic failure, in a context of changing relationships between Earth's systems due to human impact, claims that it is useful to consider two possible ways that a system can fail. First, from the point of view of the (whole) system, a “systemic failure would describe a situation where a failure in one part of the system, or parts of the system, propagates through the whole system resulting in the disappearance of the global system behaviour.” The global financial crisis of 2008 is frequently cited as an example of such a systemic failure (Haldane & May, 2011). Other examples include large-scale electrical blackouts and the disaster following hurricane Katrina in 2005. In Brazil, the sequence of failures in air traffic control that happened in 2006 may be cited as another example of systemic failure. And second, when

parts of the system fail but the consequences are restricted to the parts themselves while the system is conserving its behaviour as in a process of adaptation or change at the system level. Based on this typology of systems failures, the features of the unfolding dynamics of the truckers' strike makes the observed failure resemble the first type of failure, even if not exactly, because it was distributed among different types of systems.

The methodological approach taken to this article exemplifies a systemic inquiry carried out in real time into a complex, wicked issue (Checkland, 1999; Ison, 2017) for the purpose of generating possibilities for systemic failure avoidance and governance innovation. Causal loop diagrams (CLDs) were built based on information retrieved mainly from newspaper reports published as the strike and its events were unfolding. These were used to unveil the causes and consequences of the truckers' strike and to characterize the severe disruption and failure that emerged. CLDs allow exploration of bounded, complex situations by depicting graphically dynamic interrelationships among variables that might not have been considered, or that are not easily seen. These diagrams uncover systemic structures, showing how parts of a system that are separated by location or time might interact to generate problems (such as systemic failures). They also allow hypothesizing about solutions to these problems. CLDs typically contain one or more feedback loops that are either reinforcing or balancing processes, showing cause-and-effect relationships among variables. The CLDs presented here were drawn following the guidelines presented in Anderson and Johnson (1997) and The Open University (1999).

3 THE CAUSES OF THE STRIKE AND THE OCCURRENCE OF SYSTEMIC FAILURES

The main events leading to the strike and some of its effects and emergent properties are depicted in Figure 1. By its very nature, there are many factors that can give rise to any case of systemic failure (Ison, 2017). Figure 1 illustrates this point. The strike has shown that failure in one system (transportation) led recursively to failures in a range of coupled systems (supply-and-distribution systems), a form of cascade of failures (in the sense of Buldyrev, Parshani, Paul, Stanley, & Havlin, 2010, and Haldane & May, 2011), causing social disruption with unforeseen, potentially catastrophic, consequences. As Vespignani (2010) remembers, systems made of interdependent networks, or interdependent subsystems, can be intrinsically more fragile than each network, or each subsystem, in isolation. This behaviour is related to the fact that “the more complex a system is, the more likely that a small failure in one part of the network of components will lead to disruption and systemic failures throughout the network” (Mobus & Kalton, 2015).

strikes could not have been more different.⁷ Remarkably, in both strikes, the role of communication technology was also involved although employed with different purposes. Whereas in Chile, a telex network helped the central government to counteract the effects of the strike, a clear example of technology mediating governance praxis (Ison, Alexandra, & Wallis, 2018), in Brazil truckers used social media such as Facebook and Whatsapp to mobilize for the strike and to get support from the population. While in Chile, cybernetic thinking shaped the path of history (Medina, 2011), recent history in Brazil has been shaped by a dominant command-and-control government culture, based on reductionism and linear thinking, increasingly unable to cope with complex situations, as the responses to the strike exemplify. Although there is no doubt that the October Strike had a dramatic political impact on Chile, the same cannot be said from Brazil, where the federal government survived the strike with the same level of approval it had before: almost none⁸! Nevertheless, the strike had a significant negative impact on Brazil's economy: beyond the direct economic losses (see footnote 6), the strike caused a momentary increase in the inflation rate and led to a reduction of the projected GDP growth for 2018.

4 RESPONDING TO THE STRIKE AND TO ITS CONSEQUENCES: REINFORCING SYSTEMIC FAILURE?

In the height of the crisis triggered by the strike, the main response by the federal government to attempt to finish it, whilst avoiding the risk of major social disruption, was to announce a set of measures to address the main causes (the rising diesel prices and the unsatisfactory freight rates) of the truckers' dissatisfaction. Despite the effectiveness of those measures in finishing the strike, their effects in the long term have been the subject of debate and controversy. The concern is that they may lead to new and more severe forms of breakdown and failure in the near future. Under such pressing, disruptive circumstances, the challenge for the federal government was to come out with a set of measures that were “systemically desirable, culturally and politically feasible, and ethically responsible” (based on Checkland, 1999) which, however, can hardly be said to have occurred.

Among the measures announced by the federal government to finish the strike, two will be highlighted here: the freezing of diesel prices and the establishment of a schedule of minimum freight rates. In open market economies such as Brazil, such measures are almost impracticable, and their negative systemic effects were already known and becoming evident. For example, it is expected that the measure of stabilizing (freezing) diesel prices for at least 60 days and allowing future fuel price adjustments only on a monthly basis (before the strike Petrobras made daily price adjustments) will have significant negative social impacts. Because Petrobras is free to establish its own fuel price policy, its income losses caused by frozen diesel prices will be compensated by the federal government, burdening ultimately the tax payers. Another negative consequence of government interference on fuel (diesel) prices is the reduction of private investment in fuel supply-and-distribution systems impacting negatively on the development of the whole fuel sector in Brazil. As it is expected that the stabilization of diesel prices will lead to an increase of fossil fuel consumption, a further consequence will be not only an increase of greenhouse gas (GHG) emissions but worse it might even impair the modification of the Brazilian energy matrix (Silva, 2018). According to a study released by the Observatório do Clima (Climate Observatory) and the Instituto de Energia e Meio Ambiente (Energy and Environment Institute), in 2016, transportation was accountable for 48.2% of the total amount of GHG emissions of the energy sector in Brazil (Observatório do Clima, Instituto de Energia e Meio Ambiente, 2018). Some of the consequences of freezing diesel prices in Brazil are dynamically depicted in Figure 2.

The second highly contested measure adopted to finish the strike was the release of a Provisional Measure (“Medida Provisória”) by the federal government to regulate the rates for road freight based on truck and cargo type, among other aspects. The key element of this Provisional Measure is a schedule of minimum freight rates⁹ established by representatives from different sectors, such as agribusiness, the productive sector in general, and truckers (Camarotto, Araújo, Jubé, & Zaia, 2018). Not all freight types are included in the schedule, as for example, the so-called return freight,¹⁰ cargo types considered as exceptions, for example, radioactive products, personal effects and garbage collection services including pesticides, batteries, and electronic waste. However, although the government made adjustments and negotiated values for minimum freight rates to be included in the schedule, it is also expecting a flood of judicial challenges against it from shipping companies questioning this policy so as to ensure compliance with freight rates already contracted. Also, the Administrative Council for Economic Defense, an agency linked to the Ministry of Justice in charge of investigating violations of the economic order, has manifested its concerns with the long-term negative effects of the freights-rate schedule.¹¹ According to the Administrative Council for Economic Defense, the schedule infringes the principle of free competition, contributing to the formation of a cartel that is detrimental to consumers who ultimately will pay for price increases in goods and services.

Looking at these responses to the strike and their possible systemic implications reminds us that “the inner logic of government goes almost directly counter to the lessons of systems theory” (Mulgan, 2001). This is particularly true when governments are faced with pressing problems and the seduction of quick fixes such as modifying simple input–output relationships is even more appealing than usual. The unintended consequence of such a governance approach is, however, usually more failure.

5 LESSONS FOR POLICYMAKING?

“The system of transportation is not coherent; it is not treated as integral. Roads compete with railroads and airlines in chaotic fashion, and at immense cost to the nation” (Beer, 1968).

Although 50 years old, Stafford Beer's statement could not be more appropriate for the current situation of the transportation system in Brazil, even if in this country roads do not compete with railroads. Brazil, despite being the fifth largest country in the world, has a legacy of governments favouring road transportation over railway, so the size of its railway network remains embarrassingly disproportional (Georgiou, 2007), and policies to change this situation are almost non-existent. Past attempts to implement them have failed. As a result, road transportation accounts for about 60% of freight transportation in Brazil,¹² and the truckers' strike put into evidence the fragilities in the distribution of essential goods emerging from a dependency on this transportation model.

The strike experience also evidences the necessity to design and implement public policies to regulate freight transport and to transform the transportation infrastructure of the country by decreasing the dependency on roads and trucks. Although railroads could be an alternative option to meet this end, experience is not positive. After their privatization in Brazil, the average speed of rail transport fell in 2017 to its lowest value since 2001¹³ (adding further evidence to the case against privatization and neo-liberal policies). There seems little prospect of changing substantially the transportation infrastructure of the country in the short term.

Institutional reform (Schlindwein & Ison, 2015) is more advanced, as in the Regulatory Framework for Road Freight Transport (“Marco Regulatório do Transporte Rodoviário de Cargas”) currently under discussion in the Brazilian National Congress, which establishes norms to regulate road freight transport (ways of hiring the transporters, rules for road safety, etc.). This can be considered the main policy and institutional innovation in the sector. Although, under discussion since 2016, voting by the National Congress has been accelerated after the truckers' strike. During this time, the size of this regulatory framework almost quadrupled, and the correlation of forces in the Congress “threatens to create a policy with localized benefits and diffuse gains for road users” (Fernandes, 2018). This results in part from the difficulty to integrate and accommodate different perspectives towards effective action, and therefore, it is highly uncertain whether the desired transformation in the governance of road freight transportation will be achieved with this kind of regulatory framework. Furthermore, such regulations need to take into consideration their possible effects on the whole system instead of simply ignoring them as seems to be currently the case. Therefore, given the political circumstances of its design the framework may fail to “create possibilities for action towards improved or better futures” (Junginger, 2016), frustrating the expectation that the design of a policy brings with it the potential for change and improvement so as to achieve more desirable futures. However, desirable futures with less disruption as the result of innovative policy making are achievable as shown in the balancing causal loop depicted in Figure 3. This causal loop might be seen as complementary to the lower causal loop of Figure 1, acting in its opposite direction, against disruption.

From a policymaking perspective, one of the most important lessons to be drawn from the strike is the need to design and implement policies that take into account the interconnectedness of just-in-time retail systems aiming to reduce their failure vulnerability and disruption potential. This issue is also of central concern in the

U.K.'s attempts to move into a post-Brexit world. Another good example here is Petrobras' fuel price policy, the systemic effects of which can be seen in Figure 1. There is clearly a need for a fuel price policy with, for example, tax mechanisms (Ramalho, 2018) to soften fuel price fluctuations, avoiding daily (and abrupt) fuel price changes. As policy making is a form of governance practice, the challenge is further to carry out a paradigmatic shift to different forms of governance, because current governance practices are based on the conservation of a technical and instrumental rationality that prevents significant governance (and policymaking) innovation (Schlindwein, 2016).

6 FAILING TO ENGAGE WITH COMPLEXITY AND UNCERTAINTY: OPPORTUNITY FOR CYBER-SYSTEMIC GOVERNANCE?

The strike itself, the crisis it triggered, and the nature of the responses to it are ultimately the results of the interrelated thinking and practices of different actors that together create the possibility for the emergence of systemic governance failures. These are not the product of some “unknowable system” but the lack of systemic sensibilities, literacy, and capability in the actors, including in policy design (Ison et al., 2018). The circumstances that gave rise to the strike and the governance responses to it resulted not only from systemic policy failures (e.g., the Petrobras fuel price policy) but also from the belief in quick fixes and simple solutions (e.g., freezing fuel prices). From a governance perspective, the responses to the strike may lead to further systemic flaws, adding to the growing evidence that many governance systems are not fit for purpose (Ison et al., 2018). As Bentley (2016) claims, there is a “growing perception that politics has become dysfunctional and paralyzed, incapable of achieving the clear solutions and long term plans that people need in order to chart a course out of the crisis and into the future.” Therefore, the contemporary situations of governing and the challenges to be faced are demanding alternative ways of thinking and acting.

Given the scale and complexity of the issues that led to the strike, the fragmented and disconnected responses to it revealed a failure to institutionalize governance practices more conducive to a systemic appreciation of the situation in order to cope with its uncertainty and unpredictability. The lack of appreciation of the systemic implications and unintended consequences of the measures announced to finish the strike are symptoms of the incapacity of current institutions and practices to steer governance systems that are highly interconnected and interdependent. The capacity to respond to such situations of complexity involves more than dealing with technicalities, requiring instead more integrated intervention across different governance “silos,” where the emerging issues are unfit for compartmentalized responses, calling for more “open-ended” rather than traditional systematic command-and-control based interventions (based on Christiansen & Bunt, 2016).

The challenge is “to design transformative governance arrangements” (Ison et al., 2018), because current governments “are organized to separate activities and problems into component parts,” operating “through fragmented routines” (Bentley, 2016), which ultimately lead to failures. Cyber-systemic concepts such as feedback, recursion, circularity, variety, autopoiesis, and structural coupling offer opportunities to create the circumstances where policy makers might begin to conceptualize policy design and implementation as integrated (Ison & Schlindwein, 2015). From this perspective, policy issues must be understood and responded to systemically if effective action is to be taken (based on Ison, 2011). As the current situation shows, there are pressing needs to institutionalize such cyber-systemic governance practices to inform the design of public policies and innovative governance processes that are “fit for purpose.” This is also an opportunity to avoid the adoption of simplistic understandings of governance reducing it to the application of techno-scientific knowledge and solutions particularly in times of rapid global change and uncertainty.

7 FINAL REMARKS

The truckers strike triggered in Brazil an unprecedented crisis almost leading the country into a “total systemic failure,” with its supply-and-distribution networks and their many coupled retail systems very close to collapse. The situation had some similarities to that experienced in the autumn of 2000 in the United Kingdom

where a fuel crisis suddenly demonstrated the vulnerability of interconnected just-in-time retail systems (Mulgan, 2001). The level of disruption was largely an unintended consequence of the great connectivity and interdependence among systems and demonstrates what can happen when connectivity and feedback among systems, and elements in systems, are not taken into account. The velocity with which the strike spread over the whole country was surprising, showing the power of pervasive social media and communication technologies such as Facebook and Whatsapp which have been used by strikers to “enable coordination and collaboration that cuts across existing hierarchies and organizational structures” (Bentley, 2016). This is an example of how disruptive the use of such digital communication technologies can be when regulatory systems fail systemically, not to mention the role of those technologies in the dissemination of “fake news,” which under such circumstances of generalized systemic failure can be particularly disruptive.

Now, in the aftermath of the strike, it is also becoming increasingly clear that the promises made to the truckers to finish the strike will not be delivered in full. This is in itself another failure resulting not only due to political reasons but to the fragmented and disconnected nature of the measures taken. There is a growing concern that failing to think and act systemically so as to finish the strike may lead to more breakdown or to some new form of failure in the near future. It shows further how limited are the capabilities of governments constrained by current processes and systems of governance (Ison et al., 2018) to deal with interdependent phenomena. The business of the state is still largely organized in departmental silos (Mulgan, 2001), and its practices are based on the assumption that, to be solved, problems need to be separated from their contexts, isolated and simplified (Chapman, 2002). So it is not surprising that the government responses to the strike were not the result of a systemic appreciation of the situation. And although “there are cyber-systemic antidotes to the malaise of modern governance” (Ison et al., 2018), the challenge certainly is how to convey these antidotes into everyday governance practice.

Although systemic failures cannot be completely avoided, learning to think and act systemically can possibly reduce their occurrence as such thinking and practice can facilitate the process of coping with their consequences and disruptive effects. As the truckers' strike has painfully taught Brazilians, systemic connectedness brings with it new kinds of vulnerability and fragilities, and governments need not only to recognize and understand this but also need to learn how to design systems with requisite variety if they wish to be prepared for the disruptive events that may emerge from such situations. Creating awareness of systems failures and shortcomings is necessary at all levels, from a public manager to a street-level bureaucrat, in order to create fertile ground for change (OECD, 2017). This may demand, however, much more than new policies; more challenging than this, it may demand novel (and different) systems of governance with different modes of thinking and acting in their enactment.

The study reveals what is achievable from timely engaging in systemic inquiry. It also reveals fresh systemic understandings and insights conducive to the design of new “social systems” (Metcalf, 2014). The possibility of the praxis that gave rise to this paper is, with investment in capability, open to all stakeholders in a complex issue. The approach is likely to be most effective if organized as a systemic co-inquiry comprising actors with different interests (Foster, Collins, Ison, & Blackmore, 2016).

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