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Abstract

Policy Change or Policy Intractability in Post-Crisis Landscape? Fukushima Explosion and Comparative Nuclear Energy Policy

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From a postpositivist perspective, separation of fact and value is practically impossible. A policy is therefore contingent on not only its effectiveness and rational calculation but also on the emotional turn that is induced by, for instance, crisis either man-made or natural. In particular, the intense feeling incurred in the aftermath of crisis propels actors to re-prioritize gain versus loss. In other words, as many scholars predict, crisis can serve as a catalyst to induce and legitimize policy change that is previously highly controversial. However, no matter how sensible this may sound, many effects of crisis on policy change or policy intractability remain uninvestigated. Do policy makers in different countries react similarly or differently to the same crisis? Why there is a difference? Does policy learning equate to policy change? Or while some crises trigger policy learning, the others ontologically cause a paradigm shift in the value that determines the interpretation of the fact.

In order to answer the above puzzles, this paper uses narrative policy analysis (NPA) to conduct comparative case studies to examine how the devastating Fukushima nuclear explosion affected the nuclear energy policy in different polities. Based on method of difference (MoD), six country cases are selected – United States, France, India, Switzerland; Taiwan and Italy. Whereas the former three most similar cases are those do not exhibit nuclear policy change in the post-crisis landscape, the latter experience major policy reversal. The findings from the comparative case studies cast doubt over the presumed role of crisis as catalyst to induce policy change, demonstrates the need to categorize the ability of crisis to punctuate polities into different levels and proposes a preliminary funnel of causality approach to unravel "what, when, where, who and how" the crisis links to policy making.

Keywords: crisis, policy change, policy learning, nuclear energy policy, narrative policy analysis (NPA)

Introduction

In conventional wisdom, crises cast shadows on the polities in which they occur (Kingdon 1984, Sabatier and Jenkins-Smith 1993, Baumgartner and Jones 1993, Birkland 1998, Boin *et al*. 2009). Historically speaking, however, geographically distant crises can also cast shadows on the polities in which they did not occur. For example, the 911 terrorist attacks in New York City of the United States triggered many introduction of new "hard" and "soft" security strategies in Europe (Levi and Wall 2004). In the extant crisis management literature, not only the latter observation is rarely studied, little comparative effort has been invested in understanding the impact of the same distant crisis on various polities. As a result of the deficiency in the above mentioned area, the paper suspects that the present crisis policymaking research tendency might constrain the researchers and policy makers in the following three fallacies. First, crisis has the automatic potential to "punctuate" institutional inertia and cause major policy reversals, given that far more studies were done in explaining the link between crisis and reform in a single country public policy case study. Second, instead of offering a synthetic analysis, crisis public policy students strive to isolate single variable in post-crisis governance that accelerates the most the pace of policy reform, such as venue shopping, policy entrepreneur, type of crisis, timing of crisis or information. Third, whilst placing over-emphasis on the probability of crisis induced policy change, policy change after crisis is often translated as policy learning (Hoberg 1996, Birkland 2006).

Having suggested the above, this paper does not have the intention to degrade prior scholarly contribution on crisis management. It aims to point out some potential limitations and call for future researches to further balance our knowledge in, first the role of crisis in *both* policy reform and the absence of reform by expanding the single

country policy case study to a *cross-national comparative analysis*; second, how multiple variables in post-crisis governance interact between each other and collectively affect the pace of policy change or status quo; lastly, distinction between crisis induced policy change and policy learning.

To provide empirical examination, the paper proposes to use narrative policy analysis (NPA) to conduct cross-national comparative case studies. In this research, 2011 Fukushima nuclear crisis is targeted as a focusing event whilst its impact on the chosen six countries' respected nuclear energy policy is dissected – namely Italy, Taiwan, Switzerland; United States, India and France. The former three cases are those that experience major energy policy change after 311 Fukushima crisis; the latter are the three that do not exhibit policy change but only the rise of support in anti-nuclear movement. Methodologically speaking, the argument of this paper builds on the findings from the 6 comparative case studies on politics and policy making of nuclear energy. It is a grounded theory approach (Glaser 1978, 1992, Glaser & Strauss 1965, Strauss 1987) and it applies the method of difference (MoD) (Ragin 1987, 2000, 2008, Woodward 2003, Baumgartner 2009) to examine 3 most-similar cases against the other 3 most-similar contrasting cases in order to find their causes. I seek to open the black box of post-crisis politicking in various polities. By comparing their variation, the findings yield new understandings on the role of crisis in reform and absence of reform; "what, when, where, who and how" the crisis links to policy making; and shed light on distinction between policy change and policy learning.

Limitations in Theoretical and Empirical Studies

Three research tendencies in extant crisis management theoretical and empirical studies are pointed out in the succeeding discussion. These tendencies are often taken

for granted or over-emphasized by public policy students. The result of that might constrain research scope and blind researchers from alternative and surprising findings.

1. *Single Country Study of Crisis as Catalyst in Policy Reform*. As important theoretical explanations for major policy reforms, crisis as focusing events and windows of opportunity is frequently cited (Walker 1977, Light 1982, Cobb and Elder 1983, Baumgartner and Jones 1993, Kingdon 1995). A majority of the empirical case studies are based on single country study of how a crisis causes major policy reversals in which they occurred, such as 1996 Dutroux Crisis in Belgium (Walgrave and Varone 2008) or 1989 Exxon Valdez spill crisis (Kurtz 2004). However, parallel to what Nohrstedt (2008) hints, perhaps a more intriguing issue is why some crises result in major policy change while others *do not* (Birkland 2006, Minstrom & Vergari 1996, 't Hart & Boin 2001). Even though it is difficult to establish causal link between crisis and lack of reform due to its nonfalsifiability, its research value should not be ignored. One way to overcome this challenge is to conduct comparative study, instead of single country study. By examining the impact of a crisis on several polities, the variation 0in empirical findings shall yield new insights in further theory building.

2. *Single Variable in Causing Policy Reform*. Whilst many argue that a fully developed theory to explain the crisis-policy change linkage is not available ('t Hart & Boin, 2001, p. 43), theorists focus their attention in identifying the single variable that is pivotal in times of crisis and radical policy reversal, including venue shopping (Godwin and Schroedel 2000, Hansen and Krejei 2000, Burnett and Davis 2002, Pralle 2003), policy entrepreneur (Mintrom and Vergari 2005, Corbin 2010, Kingdon 1995), type of crisis (Nohrstedt and Weible 2010, Gundel 2005), timing of crisis

(Wood 2006, Baumgartner and Jones 1993: 130, Gladwell 2002) or information (James and Jorgensen 2009, Weible 2008, Staw et al. 1981). As a consequence, since scholars are preoccupied by singling out single variable in external shocks that affect policy agenda, it not only downplays other variables in causing policy change but also reinforces the seemingly automatic catalyst role of crisis in policy reversal. It then recursively blinds the scholars from a synthetic understanding of how crisis impacts policy change and fails to appreciate the implication of absence of reform in time of crisis.

3. *Synonym of Policy Change as Policy Learning*.

In many crisis-reduced policy researches, the boundary between learning and policy change is blurred and the causal relation between them is unclear (Bennett and Howlett 1992 and Hall 1993). Especially when applying Sabatier's "advocacy coalition framework (ACF) in analyzing empirical cases, scholars might give prime attention to learning that at times it becomes synonymous with policy change. For instance, in Lertzman, Rayner and Wilson's analysis of learning and change in the British Columbia forest policy sector (1996), the authors conflate policy change with lesson drawing and paradigm shift. The effect of this conceptual blurring is to obscure the fact that learning is an independent variable and policy change a dependent one (Hoberg 1996). It ignores the original idea in ACF to categorize learning as only one of a number of causes of policy change, instead of the primary cause. This synonym of policy change as policy learning therefore prevents scholars from noticing a formidable range of factors that are external to policy maker's decision making and policy learning process and disregards alternative explanations.

Narrative Policy Analysis and Cross-National Study

In order to bridge some limitations in the existing public policy researches, the paper proposes to use narrative policy analysis (NPA) (Fischer & Forrester 1993, Roe 1994, Stone 2002) as theoretical departure to conduct cross-national comparative public policy analysis at the aim of providing alternative explanations to both policy change and absence of change in time of crisis. While doing so, the study will also reveal the deficiency of explanatory power in using single theoretical framework, such as NPA or others. Therefore, this application of NPA in comparative study is not designed to be a theory-confirmation effort but a theory building and expansion one.

To integrate NPA into the traditional policy change theory is a methodological innovation raised by McBeth, Shanahan, Arnell and Hathaway (2007). They argue that, with some exceptions (Baumgartner 1989, Hajer 1993, Radaelli 1999, Schneider & Ingram 2005), NPA and the policy change literature rarely intersect. Yet contrary to the remark of Sabatier (2000, p. 138), narratives are the visible outcome of differences in policy beliefs and political strategizing (McBeth *et al* 2007). They are not random occurrences. By examining the policy narratives, policy beliefs are arguable stable and policy strategies are predictable. NPA can add to the ability of more traditional policy change theories to understand the strategic representation of values in framing the conflict.

Building upon McBeth and advocators of NPA, the paper further attempts to apply NPA in cross-national crisis policymaking analysis, at best to examine the impact of a single crisis on several polities. With this new combination, the empirical examinations can better reveal how do various narratives on the same crisis in different polities play into the role of both policy change or *lack of change*, namely

policy intractability. It can also help to distinguish policy learning at the technical and managerial level from political strategizing in crisis policymaking. This type of research is interested in and seek to answer questions such as "Why did this large-scale crisis cause nonincremental policy change in one polity but not in another? "Is this policy change an outcome of policy learning or strategic action for reasons that are non-problem solving oriented but political survival at domestic politics or even international politics level. Whist the former occupies the core of traditional public policy study, the latter is parallel to the lost dimensions of crisis management as 't Hart (1993) skillfully advocates a more power-critical approach to the analysis of crisis management.

This methodological experimentation purports to provide an overview on the role of crisis in policymaking and expand the research scope of public policy students. It seeks to create a dialogue between the traditional public policy study and the argumentative turn (Fischer and Forester 1993). By conducting a comparative study, the diverse empirical evidences challenge scholars' departing biased theoretical lens. This grounded theory approach research shows to the researchers that some crisis-induced policy can be explained by the interplay of language, action and power advocated by Wittgenstein, Habermas, Foucault and NPA but others might find louder resonance in practitioner-oriented handbooks and guidelines on the 'how-tos' of crisis management (Fink 1986, Raphael 1986, Nudell and Anthokol 1988, Pauchant and Mitroff 1992).

The lesson learned is that it is unrealistic to use a reductionist approach or single variable to explain the crisis policymaking. The causal relation between crisis and policymaking merits more comprehensive examination and multi-angles approach. The blackbox of post-crisis politicking is composed of "what, when, where, who and

how" the crisis links to policy making. No approach is superior than the other in causing either policy change or institutional inertia. Crisis policymaking is contingent to policy entrepreneur, venue shopping, timing, type, information of crisis and others. The list of variables is not exhausted and it requires scholars to unveil the interaction between them. One way to go beyond the current limitation of existing researches is to encourage comparative studies. The following empirical cross-national study on the impact of 311 Fukushima crisis on nuclear energy policy of six polities is to exemplify the potential breakthrough in crisis-management literature.

Comparative Case Study

Case Profile

March 11, 2011, where nuclear energy plants in Fukushima exploded after hit by 8.9-magnitude earthquake and 15-meter tsunami, is probably the date that a generation of Japanese remembers the most if explosion of the atomic bombs in Hiroshima and Nagasaki on August 6, 1945 leaves a mark in the collective memory of the last generation. The former crisis is natural while the latter is man-made. Nevertheless, the unprecedented destruction to public infrastructure, private properties, manufacturing establishments and human life are alike and both are nuclear related.

Statistics show that 441 nuclear power plants are currently operating in 30 countries, including 104 in the United States and more than 50 in France[1]. As a result, Fukushima nuclear plant crisis catches the attention of not only Japanese government and the public but its concern spread to countries that have existing nuclear energy facilities or plan to build new ones. Do countries react similarly or differently to crisis such as the Fukushima accident? If not, why there is a difference in response? Does policy learning equate to policy change? Or while some aspects of natural disaster

[1] International Atomic Energy Agency (IAEA) annual report 2010

promote policy learning, the others ontologically cause a paradigm shift in the value that determines the interpretation of the fact. Those are puzzles that are of interest in crisis-induced policy and crisis management study in general.

In order to explore deeper into the blackbox of policymaking in time of crisis, this research uses narrative policy analysis to analyze data collected in six selected country profiles - United States, France, India, Switzerland, Taiwan and Italy. The rational of case selection follows the method of difference (MoD). Three most-similar cases are chosen against the other 3 most-similar contrasting cases in order to find their causes. In the event of 311 crisis, the former are the three that do not exhibit major policy change but only the rise of support in anti-nuclear movement (see Table 1); the latter are the three cases that experience major energy policy change after 311 event (see Table 2).

As shown in Table 1, the nuclear energy programs of all the three non-crisis-induced nuclear policy change polities did not halt due to the Fukushima nuclear accident. Instead, they continuously initiate new nuclear programs. The United States, even though at the anniversary of Fukushima accident issued new nuclear regulation orders to tighten the safety measure of nuclear power plants which might be seen as act of policy learning, approved new construction of two new nuclear reactors in March 2012. As for the nuclear giant –, French President Sarkozy is the first high-level political leader to visit Japan immediately after the Fukushima incident on March 31, 2011. France also proactively took the advantage that it holds the presidency of G8 and G20 in 2011 to host various major international nuclear energy meetings or informal European ministerial meetings on nuclear safety where French ecology minister is the host. Rather than being discouraged by the nuclear accident, while taking the lead to reassure the safety of nuclear power generation at

international level, domestically France also began to consider the life extension of 22 nuclear plants that are due in 2022. Lastly, except for the first time promise to engage non-government organizations for existing and new power plants, India strives to develop indigenous nuclear power capability through international cooperation to satisfy the growing energy need as a fast modernizing country. Its new discovery of local uranium reserves provides further incentive to execute its original plan before 311 crisis to build 40 more nuclear reactors and supply 25% of electricity from nuclear by 2050.

Table 1: Three Non-Crisis-Induced Nuclear Policy Change Polities

	US	France	India
Policy before 311 crisis	Following a 30-year period since Three Mile Island crisis, it was expected to build 4-6 new units by 2020. The first of those resulting from 16 license applications made since mid-2007 to build 24 new nuclear reactors.	*France is active in developing nuclear technology. *French reactors and fuel products and services are a major export. *France exports nuclear energy to Switzerland, Italy, Germany, Belgium, Spain , UK. 2011 net export was 56 billion kWh.	*develop indigenous nuclear power capability *expect to build 40 more reactors, supplying 25% of electricity from nuclear by 2050. *international cooperation on nuclear energy facility
Policy after 311 crisis	*2 new reactors approved in March 2012 *March, 2012 Nuclear Regulatory Commission issued a new set of orders and recommendations specifically based on the lessons learned from the nuclear crisis in Japan.	*comply raised international safety standards *French Court of Audit's report echos a leaked draft government study which said that extending the life of France's reactors would be a cheaper investment option to 2035-2040 than building any type of new power plant. .	*More new plants are under planning yet worried about lack of uranium reserves *July, 2011 discovered new uranium reserves at a mine that could be the answer to India's nuclear fuel supply problems. *extended international cooperation on technology and regulations

Source: compiled by author from Lexis Nexis Academics news databank

The three crisis-induced nuclear policy change polities – Switzerland, Taiwan and Italy, however as shown in Table 2, all experienced non-incremental policy change in post-Fukushima crisis period. In the case of Switzerland, three months after

the March, 2011 incident, following a cabinet decision, the national Council on June 7, 2011 voted 101 to 54 to endorse the phase-out of nuclear energy in 2034. It overturns the original plan issued by Swiss Federal Office of Energy in 2010 deciding that the Niederamt, Beznan and Muheleberg sites are suitable for building new reactors and new nuclear programs are expected to be authorized by mid-2012. Similarly, Taiwan nuclear authority was planning the evaluation of 6 more new nuclear plants since 2009 and the 4th plant in Lungmen was near completion and expected its commercial operation in 2012. Yet the Japan nuclear crisis in March 2011 suspended all new plans and the 4th plant is on hold until further safety measure is proven. As for Italy, its 2009 nuclear energy revival plan was determined by the referendum held in June 12-13, 2011with an eye-watering 94 percent voted against nuclear power. This sudden nuclear power policy change is also marked as one of the major political defeats for the longest serving Prime Minister Silvio Berlusconi who resigned in November, 2011.

Table 2: Three Crisis-Induced Nuclear Policy Change Polities

Swiss	Taiwan	Italy
2007 strong local support for the ATEL subsidiary Nuclear Power Plant. Canton parliament called for rapid construction of a nuclear power in Niederamt. 2010 Swiss Federal Office of Energy saying that the Niederamt, Beznau and Muheleberg sites are suitable for building new reactors. A federal decision on granting general authorizations for the plants was expected by mid-2012.	6 more are in planning since 2009; The new 4th Plant was under construction in Lungmen, near Taipei. Its commercial operation was expected in 2012	*After 1986 Chernobyl crisis, a referendum rejected parliament's new nuclear energy plan in 1987 and initiated a five-years nuclear moratorium. *1993 government remained steadfast in excluding nuclear energy *2009 legislation setting up to generate 25% electricity from nuclear by 2030
Following a cabinet decision, the national Council on June 7, 2011 voted 101 to 54 to endorse the phase-out of nuclear energy in 2034. Yet actual legislature is still subject to debates and referendum in the future.	All new plans are suspended now until safety measures are secured. Nov. 2011 Taipower said the 4th new plan might be operational in 2014 at best.	2009 revival of nuclear energy plan was vetoed by referendum in 2011. Prime Minister resigned after referendum

Source: compiled by author from Lexis Nexis Academics news databank

Before the cases are systematically dissected, the research acknowledges two methodological challenges: data reduction-representation problem and subjective-objective problem. The first challenge occurs in the methodological process of openly coding the data, such as narratives in policy, where data are broken down into piece, closely examined, compared for similarities and differences as a pedologist studies soil sample brought from a forest to the lab[2]. Categories, concepts and labels are then created. This is the first stop toward theory building – to conceptualize data through classification. However, with this act of data reduction, it inevitably encounters the risk of biased representation. A question such as "Is the selected narrative representative of the policy makers?" might be asked. The second challenge grows in a similar vein as the first one. It is important to recognize that facts (objective) are constructed in a context of telling.[3]" (subjective). In the narrative policy analysis approach, the objective-subjective challenge is even doubled when researchers first subjectively select "narrative" to representation the population. Then the researchers endeavor to interpret the subjective "narrative" of speakers to understand the objective fact.

Basic Analysis of Six Cases

Speaking of the six polities that are subject to 311 nuclear crisis policy examinations, as shown in Table 3, all of them are relatively experienced in nuclear energy generation as Japan who starts its first commercial nuclear power plant in 1966. Among them, the United States possesses the greatest number of nuclear power plants in its territory, followed by France who operates 58 plants at present and India.

[2] Bruno Latour (1999) uses the analogy of pedocomparator in explaining methods of social science inquiry.

[3] Related discussion can be found in *Sociological Inquiry* by Dorothy Smith in 1974.

If only looking at the number of nuclear plants operated in a country, it appears that there is a negative correlation with the likelihood of nuclear crisis-induced policy change – the more nuclear plants a country possesses, the less likely an external crisis will cause a non-incremental policy change. It is however unclear in the correlation between percentage of energy generated from domestic nuclear power plant and likelihood of crisis-induced policy change. For example, before Fukushima crisis, Switzerland generates 40% of its energy from nuclear plants. Despite such heavy reliance on nuclear power generation, non-incremental policy change was nevertheless introduced at the awake of 311 incident. Three months after Fukushima crisis, the Swiss National Council endorsed the phase-out of nuclear energy in 2034. India, nevertheless, with only 12-15% energy generated from nuclear is determined to increase its future reliance on domestic nuclear power in the energy mix. As for whether history of nuclear disaster in territory has an impact on the likelihood of nuclear policy change in crisis, it is equally unpredictable. Strictly speaking, of the six cases, only the territory of the United States, Switzerland and Italy was directly affected by past nuclear disaster either in 1979 Three Mile Island plant crisis or 1986 Chernobyl crisis in Russia (see Table 4). Yet this direct past experience does not serve as a dependable indicator as whether its nuclear programs will be halted when a crisis strikes again despite the fact that Fukushima crisis did not cause damage or direct threat to any of the six cases under examination. For instance, Taiwan did not experience any nuclear disaster for the past forty years since its nuclear program was initiated in 1972. This lack of past crisis experience does not prevent Taiwan from generating fear and loss of confidence in its existing and new nuclear power plants in March 2011.

Table 3: Basic Nuclear Energy Country Profile Comparison

	US	**France**	**India**	Swiss	Taiwan	Italy
Starting of Nuclear energy plan	1960	1974	1969	1969	1972	1963-
Number of nuclear plant	**104**	**58**	**20**	5	3	0
% of energy from domestic nuclear generation*	20%	75%	12-15%	40%	17%	0% since 1990. 1970 2.7% 1980 1.2%
Past major nuclear disaster in territory	1979 Three Mile Island plant crisis in Pennsylvania	Sept. 12, 2011 A blast at a nuclear site in southern France killed one person but posed no risk of radiation contamination	No nuclear energy plant crisis but Indian nuclear military device explosions of May, 1998	Some areas are affected by 1986 Chernobyl in Russia	No experience of past nuclear disaster	Some areas are affected by 1986 Chernobyl in Russia

*Source: data collecting from http://www.world-nuclear.org/info/inf86.html

Table 4: Areas in Europe Contaminated by Chernobyl Fallout in 1986*

	Area with ^{137}Cs deposition density range (km^2)			
	37–185 kBq/m^2	185–555 kBq/m^2	555–1480 kBq/m^2	>1480 kBq/m^2
Russian Federation	49 800	5 700	2100	300
Belarus	29 900	10 200	4200	2200
Ukraine	37 200	3 200	900	600
Sweden	12 000	—	—	—
Finland	11 500	—	—	—
Austria	8 600	—	—	—
Norway	5 200	—	—	—
Bulgaria	4 800	—	—	—
Switzerland	1 300	—	—	—
Greece	1 200	—	—	—
Slovenia	300	—	—	—
Italy	300	—	—	—
Republic of Moldova	60	—	—	—

*Source: Table 3.2 in Environmental consequences of the Chernobyl accident and their remediation : twenty years of experience / report of the Chernobyl Forum Expert Group 'Environment'. — Vienna : International Atomic Energy Agency, 2006.

Narrative Policy Analysis of Six Cases

At the outbreak of Fukushima crisis, political leaders from the selected six countries employ different narratives to describe the crisis in Japan. This various choice of narrative (see Table 5) reflects the diverse emphasis a country places on the meaning of Fukushima crisis for them. Whilst the United States focuses on how they can provide resources and expertise to the Japanese industry, France restlessly called for international awareness and action in response to this crisis. India authority however focuses on the implication that Fukushima disaster is "a crisis but not a deterrent". Although the Fukushima narrative in these three countries connotes different meaning to the crisis, none of these three narratives implies the necessary major policy change that the country needs in response to the crisis.

Table 5: Fukushima Crisis Narrative I

Country	Fukushima Crisis Narrative (incumbent official's narrative)
US	Marvin S. Fertel, president and chief executive officer at the Nuclear Energy Institute, "We appreciate the President's leadership during this difficult time for the people of Japan. ..**we are providing resources and expertise to the Japanese industry…** "A review of our nuclear plants is an appropriate step after an event of this scale and we expect that the Nuclear Regulatory Commission will conduct its own assessment. (March 17, 2011)
France	French President Nicolas Sarkozy is the first foreign leader to visit Japan since 311. At a news conference following a meeting with Japanese Prime Minister Naoto Kan, Sarkozy warned that what happens at the Fukushima Nuclear Plant could have consequences for what he called the **"global village."** Sarkozy said it is necessary to correct the discrepancy that there are no international safety standards for nuclear power plants. He said that in cooperation with the Japanese prime minister, he plans to organize a meeting of nuclear officials from the G20 countries to prepare for the IAEA nuclear safety summit in June. (March 31, 2011)
India	In a news entitled **"A disaster but not a deterrent"** "Ours is a very power-hungry country," said Srikumar Banerjee, the chairman of India's Atomic Energy Commission.. "It is essential for us to have further electricity generation." (March 16, 2011)

Source: compiled by author from Lexis Nexis Academics news databank

Contrary to the above three countries, incumbent officials in Switzerland, Taiwan and Italy made more association in their narratives to link Japan crisis to domestic

nuclear power plant development (See Table 6). Several political leaders in Switzerland mentioned about this notion of "not possible to continue with business as usual". Taiwan officials however made effort to convince the public and their political adversary that Taiwan is located on a different fault line than Japan even though both are in earthquake-prone regions. The Italian official warned that "turning back is unimaginable" and termed Fukushima as "a new fear". In the choice of narratives, leaders from these three countries demonstrate their worries, fear and challenges that they might face. Their choice of narrative is not as firm as their counterparts in the US, France and India whose nuclear policy stayed intact after the Japan crisis.

Table 6: Fukushima Crisis Narrative II

Country	Fukushima Crisis Narrative (incumbent official's narrative)
Switzerland	Ruedi Lustenberger of the Christian Democratic Party said it **wasn't possible** to continue with **business as usual**: "We must draw conclusions from this." (March 13, 2011)
Taiwan	Premier Wu questioned Wall Street Journal report "100 nuclear reactors operate in **earthquake-prone regions..**most of those plants are in just two countries; Japan and Taiwan" He argued "Taiwan is located **on a more stable fault line than Japan**'s islands."(March 30, 2011)
Italy	"We cannot allow a new fear, not at this stage. **Turning back is unimaginable**," Economic Development Minister Paolo Romani told reporters. (March 16, 2011)

Source: compiled by author from Lexis Nexis Academics news databank

Within one to two months after the Fukushima crisis, only Switzerland and Taiwan immediately responded by initiating parliamentary discussion in the attempt to stop its future nuclear power programs (See Table 7). The Fukushima crisis did not make to the major parliamentary debates in France, India or Italy. Instead, France framed this crisis discussion to the international level. India immediately announced for the first time its decision to engage non-governmental organizations for new and existing power plants. Italian government, while still wished to execute Prime Minister Berlusconi'original plan to restart the nuclear program in 2014, announced one-year moratorium. As for the United States, even though two days after the crisis,

the Senate hosted a hearing on the nuclear regulatory commission's report, the hearing was to update the information on the nuclear safety, not to discuss the future of nuclear energy in America.

Table 7: Post-311 Immediate Policy Response

	US	France	India	Switzerland	Taiwan	Italy
Post-311 immediate policy response	*Form a NRC task force responding to 311 *Slow the original expansion *Senate hosted a hearing on the nuclear regulatory commission's nuclear reactor safety report (March 16, 2011)	* President as the first leader to visit Japan (March 31, 2011) *call for raised of international nuclear power plant safety standards	State-owned Nuclear Power Corporation of India (NPCIL) announced its decision to for the first time engage non-governmental organizations for new and existing power plants. (April, 2011)	initiate parliamentary discussion on future of nuclear energy in Switzerland	Legislators at the Social Welfare and Environmental Hygiene Committee crossed party lines and approved a non-binding resolution asking the government to stop work on the No. 4 plant until safety concerns are addressed. (March 15, 2011)	Italian government delayed reintroducing nuclear power for a year (March 23, 2011)

Source: compiled by author from Lexis Nexis Academics news databank

Deriving from narratives collected from these six cases, this project, as shown in Table 8, finds that each country frames nuclear energy differently. These narratives are the visible outcome of differences in each polity's policy beliefs and political strategizing. The three countries that do not experience major policy change after the crisis tends to offer more optimistic narrative to its own nuclear energy program: US frames nuclear energy as a technological or managerial issue that can be fix or improved, and a business opportunity; France frames nuclear energy as its national pride, an export business and a tool to strengthen international cooperation. India frames nuclear energy as a tool to strengthen international cooperation, a link to military used and terrorist, and a way to show sovereignty from super power's

interference. The three countries that experience non-incremental policy change, nevertheless, assign more pessimistic narrative to its own nuclear energy program: Switzerland frames nuclear energy as a technological failure and bad memory; Taiwan frames nuclear energy as an endless political debate topic, an unpopular solution to heavy reliance on import energy and a reliance on foreign technology; Italy frames nuclear energy as a taboo after 1986 Chernobyl crisis, a window of opportunity to defeat the already unpopular Prime Minister Berlusconi.

Table 8: Comparative Analysis

	US	France	India	Switzerland	Taiwan	Italy
What is nuclear energy for this country? *connotation from denotation	- a technology and managerial issue - a business opportunity	- national pride - export business - tool to strengthen international cooperation	- tool to strengthen international cooperation - linked to military usage and terrorist - a way to show sovereignty from super power's interference	- a technological failure and bad memory	- a political debating topic - an unpopular solution to heavy reliance on import energy - a reliance on foreign technology	- a taboo after 1986 Chernobyl - the window of opportunity to defeat the already unpopular Prime Minister Berlusconi

Source: compiled by author from Lexis Nexis Academics news databank

Another interesting observation is that election seems to be a variable that affect whether a crisis will trigger major policy change or not in a polity. If the timing of crisis concurs with the election time, a distant crisis is then easily framed as a domestic political concern. The data shows that the three countries that experience nuclear policy change during crisis are either in the election campaign period or its political leader had unprecedented low political support. On the contrary, when the Fukushima explosion occurred, US, France and India were not under electoral pressure and incidentally their nuclear energy policy stay intact.

In the case of Switzerland (see Table 9), shortly after Fukushima crisis, results from four elections to cantonal parliaments show the Liberal Greens who against nuclear energy among are the clear winners[4]. Political scientist Georg Lutz at Lausanne University in April 2011 also commented that the accident in the wake of a powerful earthquake in mi-March will change the campaign ahead of October's elections to the federal parliament. And it did. In the October 2011 Federal election, the Green Liberal was again the clear winner, gaining 12 seats compared to its 3 seats in 2007 election.

Table 9 Election, Crisis and Policy Change

	US	France	India	Switzerland	Taiwan	Italy
Electoral Environmental/timing	No election	No election	No election	Cannon election/ parliamentary election	Presidential election	Low support of PM
Venue of Policy Dispute	Nuclear science, technical or regulatory agencies	International meeting, Presidential office/Government	Government: Prime Minister, External Affairs Minister, United Nations	Local vs national politics	Presidential election	Constitutional court, referendum, resignation of PM

Source: compiled by author from Lexis Nexis Academics news databank

In Taiwan, the Fukushima crisis made the 4th nuclear plant controversial again the core political dispute in 2012 January presidential election. Three presidential candidates all address their position in nuclear energy development in Taiwan. Incumbent President Ma from KMT party gave a political statement by saying that "The new energy policy should be crafted in a proactive, practical and responsible manner in keeping with the principles of no power rationing, maintenance of stable electricity prices and continued reduction of carbon dioxide emissions to meet international goals."[5] Opposition Democratic Progressive Party Presidential

[4] Swissinfo.ch April 11, 2011 Fukushima fallout spreads to Swiss politics
[5] Economic Forecasts & Opinions January 1, 2012 Fukushima 2.0 in the Making?

candidate Tsai Ing-wen declared that if she wins next year she will close all three of Taiwan's existing nuclear power plants and mothball the Longmen NPP[6], seeking to end Taiwan's nuclear energy program by 2025. Candidate number three, James Soong of the People First Party, favors not extending the service life of the three existing NPPs but favors a "wait and see" approach on the Longmen NPP.

In Italy, although there was no major election when Fukushima crisis occurred, the political support for the former Prime Minister Berlusconi was low. Even before the crisis, in the 2nd half of 2010, only 28% of poll opinion preferred the Berlusconi government staying in place until the end of the term. 42% preferred a grand coalition government taking over. 30% preferred a snap general election[7]. The June 2011 referendum is another major disapproval from the public to the Berlusconi government. Yet, the June referendum is the second setback where two weeks before the referendum, Berlusconi's government which yokes his Freedom People movement to the regionalist and Islamophobic Northern league, first ran into serious trouble on May 30 when his candidate for mayor of Milan[8] lost in a local election runoff. In November 2011, Berlusconi lost his parliamentary majority and pledged to resign after an austerity package was voted in as the country was buffeted by the Eurozone debt crisis.

In sum, if venue shopping is a strategy used by policy makers in policy change, by analyzing "where" the Fukushima crisis and its response were mostly discussed in a polity, the researcher can understand how each country frame the nature of this policy problem. For Switzerland, Taiwan and Italy, the nuclear energy policy in the

[6] Taiwan currently has three power plants: Chinshan NPP license expires in 2018-2019. Kuosheng in 2021-2023 and Maanshan in 2024-2025.

[7] Angus Reid Public Opinion 08/08/10 Few Italians want Berlusconi to finish his term.

[8] Milan is Berlusconi's home city and traditionally a weather-vane accurately pointing to Italy's future political direction. See more in *The Guardian* June 13, 2011 Berlusconi's nuclear power plants crushed.

post-311 period are mostly discussed at electoral campaign at cannon, federal or presidential level and vote-related arena such as referendum. In US, France and India, however, the venue of policy debate is at technological or managerial level or international meetings. As for the United States, its aim is not to push for policy change by legal mean but to improve the technology and management of nuclear power generation. As for France and India, nuclear energy is not merely a domestic policy issue but an issue that need international cooperation and attention.

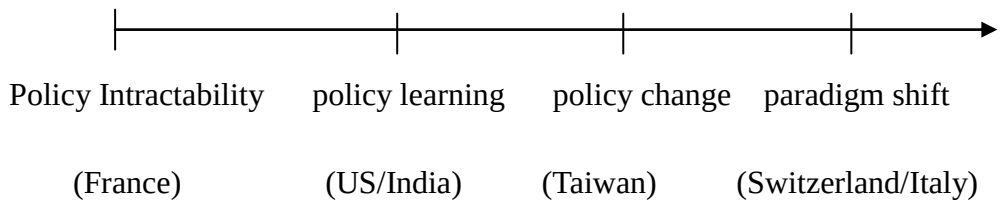
Theoretical Suggestions and Conclusion

In conventional wisdom, crises such as natural disaster may serve as a catalyst to induce and legitimize policy change that is previously highly controversial (Kingdon 1984, Sabatier and Jenkins-Smith 1993, Baumgartner and Jones 1993, Birkland 1998, Boin *et al*. 2009). However, whilst many argue that a fully developed theory to explain the crisis-policy change linkage is not available, many aspects of why some crises result in major policy change while others do not remain in the black box. By conducting comparative case study, this research is a preliminary effort to unravel the post-crisis blackbox politicking. The findings generated from grounded theory approach of collecting and analyzing data contribute to the theory of crisis-management in the following three areas.

Firstly, the innovative way of comparative case study shows that crisis does not always trigger major “policy change” as many claimed. In analyzing the impact of Fukushima crisis on the six countries, the nuclear energy policies in the US, France and India did not experience non-incremental change of policy direction in post-311 period whereas institutional inertia of Switzerland, Taiwan and Italy was clearly punctuated by crisis resulting major policy reversals.

Secondly, data from comparative study shows that crises are indeed as commonly understood to attract increased attention to public problems, known as focusing events (Birkland 1998), even in countries that do not experience major policy change such as France. In other words, the study implies that the ability of crisis to punctuate institutional inertia varies and should be categorized into different levels. For example, the impact of Fukushima crisis to punctuate institutional inertia of the six countries can be divided into four levels (See Figure 1). After the Fukushima crisis, France demonstrates its policy intractability by successfully framing the nuclear energy crisis and related policy at the international level, away from the domestic politics. US and India respond the crisis with a problem-solving attitude. While the US learns from the crisis and demonstrates policy learning by emphasizing technical and managerial improvement, India responds the crisis by engaging non-governmental organizations into existing and new nuclear programs. As for Taiwan, Switzerland and Italy, although they all reversed the direction of their nuclear program, Switzerland and Italy demonstrate a nearly paradigm shift in terms of their belief in developing future nuclear energy programs, instead of a partial policy change such as in the case of Taiwan.

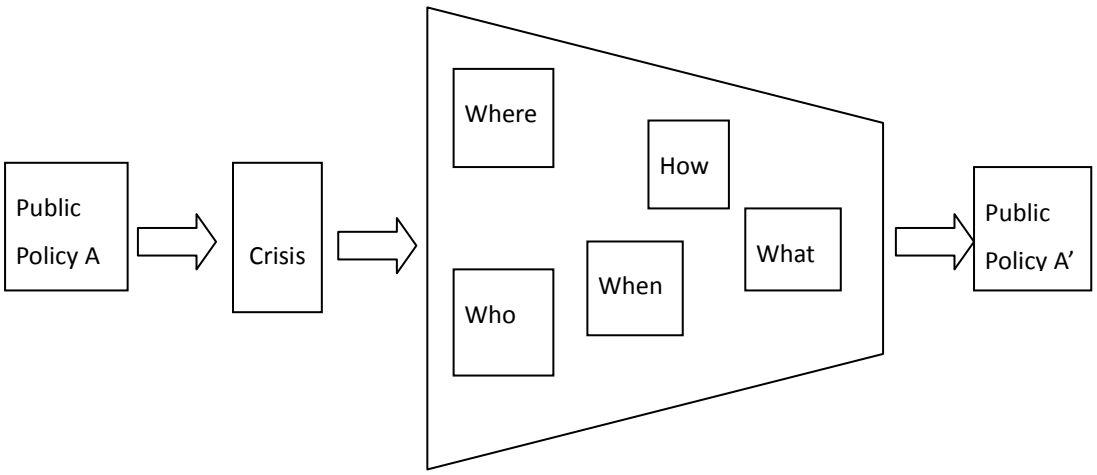
Figure 1: Impact of Crisis on Polities



Thirdly, the comparative data shows the complexity and vast variation in the correlation between crisis and policy reform/lack of reform. It entails that no single variable can best explain the blackbox of post-crisis politicking. To better explain

crisis management, the research proposes a funnel of causality approach (See Figure 2) to unravel "what, when, where, who and how" the crisis links to policy making. This synthetic approach emphasizes to include type of crisis, timing of crisis, venue shopping, policy entrepreneur and political strategy, etc into the analysis.

Figure 2: Post-crisis Funnel of Causality



In conclusion, by conducting empirical examinations of six cases in the post 311 event, this research demonstrates the usefulness of comparative study to widen the researcher's ability to discover new understanding on correlation between crisis and policy making. It can also widen the scope of research to explore why some crises result in major policy change while others do not and contribute to further theory building in crisis-management. The findings from the comparative case studies cast doubt over the presumed role of crisis as catalyst to induce policy change, demonstrates the need to categorize the ability of crisis to punctuate polities into different levels and proposes a preliminary funnel of causality approach to unravel "what, when, where, who and how" the crisis links to policy making. Lastly, what

should be learned from this complexity of comparative crisis-induced policy analysis is that crises do not occur in a political-administrative vacuum. They interfere with ongoing political and bureaucratic process and debates in any given policy area (Nohrstedt and Weible 2010, 26). Especially, in the era of globalization, fast-flow of information and regional cooperation, a crisis is no longer constraint to impact the polity that it occurs. A crisis has more potential today to expand its influence globally, either intentionally such as the case of France in this study, unintentionally or inevitably.

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