The Egyptian Revolution as a Non-Cooperative Game of Conflict

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Abstract

In this paper, the ongoing subjective debate on the role of different players in the Egyptian revolution is assessed using Fraser Hipel technique for analyzing political conflicts. This analysis will open the door for an objective investigation of the conflict behind the Egyptian revolution. After 18 days of protests, the Egyptian protestors celebrated Mubarak's resignation, and the Supreme Council of Armed Forces (SCAF) led the transitional period. However, the series of confrontations between SCAF and civil opposition have ignited an intense debate about the role of different players in the revolution. Still, most of these debates are based on subjective records and personal opinions. This paper will analyze the Egyptian revolution as a non-cooperative game using Fraser-Hipel technique to reach to a more objective understanding of the revolution. Fraser-Hipel Technique extends the notion of Nash equilibrium to apply it to different political conflicts. Due to the lack of objective records of the revolution, the ongoing debates are modeled into six scenarios to determine which ones can lead to the revolution outcome from a strategic perspective. In addition, the role of different players in realizing the outcome will be assessed. Among the core conclusions, the analysis negates the notion that Mubarak's resignation was achieved through a coup d'état rather than a popular revolution. In addition, the possibility of a neutral stand of SCAF during the revolution is supported by this analysis.

JEL Codes: D74 (Conflict; Conflict Resolution), C72 (Non-Cooperative Games), H12 (Crisis Management).

The Egyptian Revolution as A Non-Cooperative Game of Conflict

Introduction:

On the 25th of January 2011, the Egyptian protestors marched into the streets announcing their demands of ending the 30-year old rule of President Mohamed Hosni Mubarak. During 18 days of protests, three main players occupied the newspapers headlines; Mubarak and his regime, Supreme Council of Armed Forces (SCAF), and the protestors. The conflict ended with Mubarak's resignation, SCAF's being in charge of the country for a transitional period, and protestors celebrating their victory. However, the effectiveness of the roles played by the three players in reaching that outcome is one of the most debated topics about the Egyptian revolution. Due to the lack of accurate objective records of what happened behind the scenes of the revolution, politicians and researchers are disagreeing on the contributions and stand of the different players, especially SCAF and Mubarak.

This paper will investigate the stand and the impact of the main players in reaching the outcome of the revolution using a game theory approach. Six different scenarios of players' preferences are run to investigate the possible equilibrium outcomes under each. Fraser-Hipel Technique of analyzing political conflicts is used to investigate the equilibrium points under each scenario. Putting the results of the different scenarios together, the contributions of different players to the revolution can be understood.

Context of The Conflict and The Revolution Debates:

As one of the events that attracted the attention of the world, the Egyptian revolution has been heavily discussed in different media channels. However, the progress in the academic discourse in studying the Egyptian revolution and the struggle between different powers was less intense. This makes relying solely on the academic sources for reference in understanding what happened behind the scenes insufficient. Accordingly, there will be an urgent need to consider opinion articles and accounts of witnesses who played important roles in the events. Altogether, there is a wide disagreement regarding the actual role played by different players in the revolution.

The role of SCAF in the revolution, and its relation to Mubarak is one of the most controversial topics. However, the existing discussions are characterized with high subjectivity that opens the door to consider all the possibilities. Due to the lack of exact records of the events behind the scenes, most of the literature that covers the role of SCAF in the revolution is highly subjective and politicized. This is due to two main factors. First, the fact that the revolution is a recent event did not allow for accurate research. Second, the role that SCAF played as a ruler of Egypt for the year and half following the revolution might have caused biases in portraying SCAF during Mubarak's era and the revolution. Accordingly, any study of the relation between Mubarak and SCAF during the revolution must consider all the available possibilities.

The literature that tackles the relation between Mubarak and SCAF tends to divide the relationship between them into two eras. First era is characterized by loyalty of SCAF to Mubarak without significant problems. According to September 2008 Wikileaks cable, Tantawi was described by mid-level Egyptian military officers as "Mubarak's poodle". They are both old and resistant to change, sharing the same views (Borger and Ball, 2011). According to these officers, he created a "culture of blind obedience". Robert Springborg, professor at the Department of National Security Affairs at the Naval Postgraduate School in California, and an expert of the Egyptian Military establishment mentions that Mubarak managed to keep the army loyal to him by offering them a cradle-to-grave welfare system. He allowed them to manage the military factors conscribing labor without paying taxes. In addition, they had their own hospitals, preferential mortgages, holiday villages, and officers' clubs (Steavenson, 2011).

The second era is characterized by the rise of businessmen politicians and Gamal Mubarak which led to internal divisions in the regime, fueling the discontent of the military. In his book *Tahrir: The Last 18 Days Of Mubarak*, Abdul Latif El Menawy (2012), the head of news division at Egyptian State TV, diagnose the inner split of the regime into two main coalitions. First coalition included Mubarak's son and future heir, Gamal, Mubarak's wife, the president's close aides in NDP, Minister of Interior, and Minister of Information. The second coalition has the senior military leaders including the minister of defense, along with Omar Suleiman, long time head of the General Intelligence. Members of this coalition were very critical of the attempts of the first to pass the power to Mubarak's son. In his book, *The Military and The Revolution: The Final Days,* Mostafa Bakri (2011) went along the same lines by emphasizing the continuous opposition of the army to the inheritance scenario. Although this might seem to be a political conflict over power, Ewan Stein (2012) adds that there is a strong economic component to this rivalry. The economic reform agenda led by Gamal Mubarak and the Prime Minister Ahmed Nazif involved strong privatization program. Despite the fact that the military assets were left untouched by the program, it constituted a future threat to their control of economic resources as it undermined the state controlled economy favored by the military (Fisher, 2011). So, the second era is characterized by rivalry between these two factions in the regime. It is to be noted that this internal division in the authoritarian regime itself set the ground for negotiations and change in the political system. O'Donnel and Schmitter (1986) argue that "there is no transition whose beginning is not the consequence of important factions within the authoritarian regime itself". They argue that that this will initiate a process of strategic bargaining which might steer the political system towards more democratic outcome. In other words, these pre-revolution divisions facilitated the quick change created by the revolution.

Although there is a general agreement on this internal split, there is less agreement on the relative significance of different actors and events in the Egyptian revolution (Sallam, 2013, p. 248). The role of SCAF in the revolution is one of the controversial topics among researchers. Despite the fact that SCAF has a significant role in the revolution, its stand and the motives behind its actions are debatable.

One of the mainstream opinions regarding the role of SCAF is that it was a revolutionary player that pushed Mubarak to resign. El Menawy (2012) account for the events behind the scenes tends to support this hypothesis. On the 10th of February, the military leaders decided to broadcast an

announcement independently, signaling the president's formal departure from office. Abou Taleb (2011) adds that this statement was the declaration of the army's pro-revolution stand. Abdel Hadi (2011) investigated the role of SCAF behind the scenes to conclude their significance in directly asking Mubarak to step down. Bakri (2011) goes along the same line by stating that the army's decision to side with the protestors was the "decisive factor" in forcing Mubarak's to resign. This view of the army as a supporter of the revolution against Mubarak's regime can also be seen in the mottos of the protestors like "people and the army are one hand". However, this understanding of SCAF's role as the "guarding angel" of the revolution is criticized for two reasons. First, this portrayal of military leaders as the heroes of the revolution was extensively communicated during SCAF rule after the revolution. This might have been to cover and divert the public from focusing on the violations during their rule (Sallam, 2013, p. 251). Also, the time was not enough for conducting accurate investigation and making bold conclusions. The two books by El Menawy and Bakri came out during the rule of SCAF which raise questions about their biases. The second criticism suggests that the pro-revolutionary stand of the army was motivated by its rivalry with Gamal Mubarak and his aides, and protecting its own economic interests from their future plans. It was not aiming at supporting the people, but more of a way to maintain their own economic and political interests (Sallam, 2013, p. 252) (Fisher, 2011).

The second opinion classifies the role of SCAF as an observer of the events rather than an actual player. There are three arguments that support this claim. First, the Field Marshal Tantawi refused Mubarak's offer on January 29th to take on the post of vice president or deputy prime minister (El Menawy, 2013, p.139). This was an indicator that the military did not want to be involved in Mubarak's struggle for survival. Second, although the army forces were deployed to the streets by Mubarak's orders, they maintained a neutral stand targeting only the looters and keeping order in the streets without dealing with protests (Hauslohner, 2011) (World Tribune, 2011). Third, the fact that the military officers opened the way for the armed men who were preparing to attack protestors on 2nd February in what is known as "battle of the camels" supports the notion of their neutral stand. Sallem suggests that it might have been a way to allow for the confrontation between the regime and the protestors and then side with the winner (Sallam, 2013, p.252). Moreover, some observers add that this battle was the last moment of neutral stand of the army. In the next day, 3rd of February, it was reported that the army intervened to push pro-Mubarak demonstrators back, and protect the revolutionaries after the bloody incidents (Beaumont and Shenker, 2011).

Another ongoing debate tackles the stand of Mubarak himself from the revolution. One opinion supports the fact that Mubarak was intending to protect his hold on power under any costs due pressures from his son, Gamal. Mohamed Abou El Gheit (2013), the former Egyptian Foreign Minister during Mubarak's era, supported this theory in his memoir "My Testimony".He adds that this was accompanied with a strong belief of the ineffectiveness of the protesting movement. Hossam Badrawi, one of the leaders of NDP, went along the same lines by emphasizing Mubarak's grab on power due to his son's pressure (Kenner, 2013). On the other hand, Mubarak supporters, after his resignation, believe that Mubarak had chosen to avoid bloody conflicts and support a peaceful transition. "We're sorry Mr. President" is one of the largest pro-Mubarak groups that propagates this idea(Abdel Baki and

Mahmoud, 2011). These two opinions summarize the ongoing debate about Mubarak's stand from the revolution.

To sum up, there is a general disagreement in the public discourse about the stand of both SCAF and Mubarak during the revolution. SCAF is perceived to be either neutral, or revolutionary, while Mubarak is viewed to be either a hardcore dictator, or a preserver of the Egyptian blood. There is no enough evidence to reach a final word, but opinions and biased guesses.Accordingly, there is a need to assess these as parts of a conflict using a clear analytical methodology.

The Methodology; The Fraser- Hipel Technique For Analyzing Political Conflicts:

The Fraser-Hipel Technique for analyzing political conflicts was based on earlier work of Howard (1971) and Fraser and Hipel (1979). It extends the notion of Nash equilibrium (1951) to come up with resolutions for complex political conflicts. It has been used in modeling several political conflicts like the Suez Canal Crisis (1980),Watergate tapes conflict (1982), the Falkland/Malvinas conflict (1988), the Armenian-Azerbaijani conflict (1990), and others. The technique has its advantages of being dependent on simple algorithm that requires no background in game theory, and providing more realistic modeling of complex conflicts (Shupe et al, 1980).

In order to use the method of Fraser and Hipel (1979), the conflict must be formulated as a game. Each player or participant in the game has options. A selection of the options to implement in a given situation is called a strategy. When each player chooses a strategy, the result is referred to as an outcome. Each player has preferences as to a preferred outcome, and when all outcomes are arranged of decreasing preferences, the preference vector for a player is formed. Then, each outcome is analyzed for stability from each player's point of view. Outcomes which are stable for all players are called equilibrium and represent possible resolution of the conflict (Shupe et al, 1980).

Applying this technique to the Egyptian revolution will prove to be useful. It enables for an easy simple representation of the conflict as a non-cooperative game between three players. The easy algorithm developed does not require mathematical knowledge which makes the topic easily accessible and understandable by non-specialists in game theory. It also allows for having different combinations of actions of the three players which enriches the analysis. Moreover, the use of ordinal preferences instead of payoffs is more convenient to the nature of the conflict when quantification of the payoffs is not feasible. The main challenge in applying this method to the Egyptian revolution is the lack of objective information to assume certain order of preferences. However, this was overcome by suggesting different scenarios and assessing their relevance to a given known outcome.

Applying Fraser-Hipel Technique to the Egyptian Revolution:

In order to apply Fraser-Hipel Technique to the Egyptian revolution, we'll start by defining the players and their options. Although, there are many players in the Egyptian revolution, Mubarak (representing the NDP regime), SCAF, and the protestors were the three main players. While protestors were marching into the streets, Mubarak had to choose between resignation, or staying in power "do not resign". SCAF had to decide on its stand as an observer by standing neutral, or supporting the

revolution. Protestors, at any point, faced the puzzling decision of continuing protesting, or giving up their demands. Given these players options, the possible outcomes of the game can be represented as the following:

Possible Outcomes

SCAF								
Neutral	1	1	1	1	0	0	0	0
Pro-Revolution	0	0	0	0	1	1	1	1
Mubarak								
Resign	1	1	0	0	1	1	0	0
Do Not Resign	0	0	1	1	0	0	1	1
People								
Protest	1	0	1	0	1	0	1	0
Give Up "Stop Protesting"	0	1	0	1	0	1	0	1
Decimalized Outcomes	21	37	25	41	22	38	26	42

In the previous table, the outcomes are represented by columns containing "1"s and "0"s. A "0" besides player option indicates that this option is not chosen by the player, while "1" means that it was selected. For instance, the first column represents the outcome that SCAF chose to be neutral, Mubarak resigns, and the people continue protests. It is represents by the number 21 which represents the decimilization of this outcome.

Although there are $2^6 = 64$ possible options, only the above ones are the logical. For instance, outcomes that has "0"s, or "1"s for the two options of any player are omitted as they will prove to be contradictory. This will leave us wih only eight feasible outcomes.

For convenience, the outcomes in the above table are represented as decimal numbers. These numbers appear below the outcome they represent in the table. The decimal numbers are obtained by considering the columns to be binary numbers. For example, the first outcome to the left can be represented by :

$1 \times 2^0 + 0 \times 2^1 + 1 \times 2^2 + 0 \times 2^3 + 1 \times 2^4 + 0 \times 2^5 = 21$

Having decilmalized each outcome, preference vectors for each player are formulated such that the most preferred oucome is placed on the left, and the least preferred outcomes are placed on the right. The placement of each outcome in the prefernce vector is subject to the general rational of the arrangement. While the preferences of the protestors are known, there is a wider disagreement on the preferences of Mubarak and SCAF. This will be overcome by assuming six scenarios of different combinations of the preferences of the three players. While the people will have the same preference vector over the six scenarios, SCAF will switch between two preference vectors, and Mubarak will

choose between three preference vectors. As people are revolting against the regime, they would always prefer to end Mubarak's rule. SCAF will have to choose between playing the role of an observer, or taking a revolutionary stand to support the people which will be reflected on its preferences. Finally, Mubarak will have to weigh the significance of the other players to take a stand, so he could refuse any compromises, or start to compromise with the people or SCAF depending on his assessment of their relative significance. Different combinations of these preference vectors can be represented by the following scenarios.

Table (1): The Six Possible Scenarios

The Scenario	Mubarak's Stand	SCAF's Stand
First	Uncompromising	Observer
Second	Uncompromising	Revolutionary
Third	Compromising with SCAF	Observer
Fourth	Compromising with SCAF	Revolutionary
Fifth	Compromising with Protestors	Observer
Sixth	Compromising with Protestors	Revolutionary

After deciding on the preference vectors for all the players, stability analysis will be done to reach to the equilibrium outcome. An outcome is stable for an individual player if it is not reasonable for him to change the outcome by switching the strategy. An outcome has overall stability if it is stable for all players, and hence constitutes a possible solution of the conflict (Hipel & Fraser, 1979).

The first step in the stability analysis is to determine the Unilateral Improvements (UI) from each strategy. A UI is a more preferred outcome than the outcome under consideration, which can be achieved if the player changed his strategy, assuming other players do not change their strategies. After listing the UIs of each outcome, the rational outcomes would be defined as outcomes in which the players have no strategy change to a preferred outcome. Thus, outcomes with no UI are listed as rational and denoted by (r). Outcomes that are not rational are then analyzed for stability. If an outcome for a given player has UI's to outcome in which other players also have UI's, and if at least one of these UI's puts the particular player in a less preferred position, then the original outcome being examined is "stable" for the particular player. It is denoted by "s". If an outcome is unstable, then there must be a more preferred outcome to which the player under consideration can move, one that cannot be deterred by other players changing their strategies. This would be an unstable outcome, and denoted by "u" (Meleskie, Hipel & Fraser, 1982).

After classifying outcomes as rational (r), stable (s), or unstable (u), the simultaneous stability is determined to decide on the equilibrium outcome. An outcome that is stable or rational for all players would represent equilibrium and are denoted by (E). Any outcome that is unstable for at least one player would not lead to equilibrium and are denoted by (X). The equilibrium outcomes are possible solutions for the conflict. The details of the stability analysis of the six scenarios of the Egyptian revolution game are explained in the next section.

First Scenario:

Observer SCAF, Uncompromising Mubarak:

In this scenario, SCAF prefers outcomes that exert the heaviest possible pressure on Mubarak without their direct interference. They prefer to change the status quo due to their opposition of the inheritance plan and the growing danger of the new elite in the NDP. However, due to uncertainty about revolution outcome and the risks of direct involvement in politics, they prefer to reach their goals while being observers rather than change imposers. Direct interference will be a last and less preferred resort to protect their interests. Accordingly, SCAF's preference vector will be:

SCAF { 37 21 22 38 25 26 42 41 }

Mubarak does not want to give up his grab on power under any costs. This is derived by his regime's intent to pass on the power to his son, Gamal. For him, any compromise might put the future of the whole family in danger, due to possible trials. Hence, Mubarak will have "Don't Resign" as a strictly dominant strategy. For him, resignation is not a preferred outcome under any circumstances. Also, he avoids confrontation with SCAF as much as possible which is reflected on his preferences. He will have the following preference vector:

Mubarak { 41 25 42 26 37 21 38 22 }

After 30 years of silence, protestors marched into the streets aiming at ending Mubarak's era. They prefer any outcome at which Mubarak resigns under any costs. They also prefer to achieve their goal with the least interference from SCAF so that they will not fall under a new military regime. However, if they failed to force Mubarak to resign, they would prefer outcomes that exert the highest possible pressure on Mubarak to force actual changes, even with the support of the military. Accordingly, they will have the following preference vector:

Protestors { 37 21 22 38 26 25 42 41 }

The stability analysis of the game leads to the identification of one equilibrium at (25). SCAF will choose to remain neutral, Mubarak will not resign, while the protestors continue protesting. This indicates that under the observer role of SCAF and Mubarak's persistent grab on power, the protests will prove to be ineffective in pushing him to resign.

Stability Analysis for First Scenario

SCAF

X	**X**	**X**	**X**	**E**	**X**	**X**	**X**	
r	**S**	**r**	**s**	**r**	**u**	**r**	**u**	
21	22	37	38	25	26	42	41	
	21		37		25		42	**UI**

Mubarak

E	**X**	**X**	**X**	**X**	**X**	**X**	**X**	
r	**U**	**r**	**u**	**r**	**u**	**r**	**u**	
25	21	41	37	26	22	42	38	
	25		41		26		42	**UI**

People

X	**X**	**E**	**X**	**X**	**X**	**X**	**X**	
r	**S**	**r**	**u**	**r**	**s**	**r**	**u**	
37	21	25	41	22	38	26	42	
	37		25		22		26	**UI**

r = rational.

s= stable.

u= unstable

UI = Unilateral Improvement.

E= Equilibrium.

X= Not Equilibrium.

Second Scenario:

***Revolutionary SCAF, Uncompromising Mubarak*:**

Under this scenario, SCAF will prefer to take a revolutionary stand rather than being an observer with two goals to be achieved from this. First, SCAF aims at changing the status quo due to the threat of the new political elite in the NDP, and SCAF's oppositionto the power inheritance plan that might affect its political and economic interests. Second, SCAF wants to communicate its image of a revolutionary pro-people leadership so that it can guarantee a favorable position after the downfall of Mubarak, or gain popularity that will add to their political weight if he remained in charge. Accordingly, its preference vector will be as:

SCAF { 22 38 37 21 26 42 25 41 }

Mubarak does not want to give up his grab on power under any costs. This is derived by his regime's intent to pass on the power to his son, Gamal. For him, any compromise might put the future of the whole family in danger, due to possible trials. Hence, Mubarak will have "Don't Resign" as a strictly dominant strategy. For him, resignation is not a preferred outcome under any circumstances. Also, he avoids confrontation with SCAF as much as possible which is reflected on his preferences. He will have the following preference vector:

Mubarak { 41 25 42 26 37 21 38 22 }

After 30 years of silence, protestors marched into the streets aiming at ending Mubarak's era. They prefer any outcome at which Mubarak resigns under any costs. They also prefer to achieve their goal with the least interference from SCAF so that they will not fall under a new military regime. However, if they failed to force Mubarak to resign, they would prefer outcomes that exert the highest possible pressure on Mubarak to force actual changes. Accordingly, they will have the following preference vector:

Protestors { 37 21 22 38 26 25 42 41 }

The stability analysis of the game leads to the identification of one equilibrium at (26). SCAF will support the revolution, Mubarak will refuse to resign, while protestors will continue to protest. This indicates that the fact that SCAF chose to support the revolution was not enough to lead to an outcome at which Mubarak resigns under this scenario.

Stability Analysis for Second Scenario

SCAF

X	**X**	**X**	**X**	**E**	**X**	**X**	**X**	
r	**s**	**r**	**s**	**r**	**u**	**r**	**u**	
22	21	38	37	26	25	42	41	
	22		38		26		42	**UI**

Mubarak

X	**X**	**X**	**X**	**E**	**X**	**X**	**X**	
r	**u**	**r**	**u**	**r**	**u**	**r**	**u**	
25	21	41	37	26	22	42	38	
	25		41		26		42	**UI**

People

X	**X**	**X**	**X**	**X**	**X**	**E**	**X**	
r	**s**	**r**	**u**	**r**	**s**	**r**	**u**	
37	21	25	41	22	38	26	42	
	37		25		22		26	**UI**

r = rational.

s= stable. u= unstable

UI = Unilateral Improvement.

E= Equilibrium. X= Not Equilibrium.

Third Scenario:

Observer SCAF, Compromising Mubarak with SCAF:

In this scenario, SCAF prefers outcomes that exert the heaviest possible pressure on Mubarak without their direct interference. They prefer to change the status quo due to their opposition of the inheritance plan and the growing danger of the new elite in the NDP. However, due to uncertainty about revolution outcome and the risks of direct involvement in politics, they prefer to reach their goals while being observers rather than change imposers. Direct interference will be a last and less preferred resort to protect their interests. Accordingly, SCAF's preference vector will be:

SCAF { 37 21 22 38 25 26 42 41 }

Although Mubarak prefers to stay in power, he also has a significant consideration for compromising to avoid direct confrontation with SCAF and high scale violent conflicts. He prefers outcomes where he can stay in power without SCAF's threat. However, if SCAF presents any threat that might lead to a conflict between presidency and army, he chooses to resign. Mubarak put less weight on conflicts with the protestors than SCAF, due to historical experience of crushing civil opposition. For Mubarak, the worst case scenario is to have both SCAF and the People against him while he insists not to resign which might lead to bloody conflict. Accordingly, his preference vector is:

Mubarak { 41 25 37 21 38 22 42 26 }

After 30 years of silence, protestors marched into the streets aiming at ending Mubarak's era. They prefer any outcome at which Mubarak resigns under any costs. They also prefer to achieve their goal with the least interference from SCAF so that they will not fall under a new military regime. However, if they failed to force Mubarak to resign, they would prefer outcomes that exert the highest possible pressure on Mubarak to force actual changes. Accordingly, they will have the following preference vector:

Protestors { 37 21 22 38 26 25 42 41 }

The stability analysis of the game leads to the identification of three equilibrium outcomes at (22, 37, 25). In the first, SCAF will choose to support the revolution, Mubarak will resign, and the protestors will continue protesting. In the second, SCAF will choose to take a neutral stand, Mubarak will resign, and the protestors will give up. In the third, SCAF will take a neutral stand, people will protest, but Mubarak will not resign.

Under this scenario, comparing the first and third equilibria, the protests of the people will be ineffective without the support of SCAF. Only the switch in SCAF's stand from neutrality to revolutionary is what will push Mubarak to the resign outcome. Hence, even if Mubarak is willing to compromise, SCAF will have to take a revolutionary stand for revolution outcome to take place. Otherwise, the outcome can take place if Mubarak chooses to resign willingly due to his fears of possible conflicts, or misconceptions about the stand of SCAF.

Stability Analysis for Third Scenario

SCAF

X	**E**	**E**	**X**	**E**	**X**	**X**	**X**	
r	**s**	**r**	**s**	**r**	**u**	**r**	**u**	
21	22	37	38	25	26	42	41	
	21		37		25		42	**UI**

Mubarak

E	**X**	**X**	**E**	**E**	**X**	**X**	**X**	
r	**u**	**r**	**s**	**r**	**u**	**r**	**u**	
25	21	41	37	22	26	38	42	
	25		41		22		38	**UI**

People

E	**X**	**E**	**X**	**E**	**X**	**X**	**X**	
r	**s**	**r**	**u**	**r**	**u**	**r**	**u**	
37	21	25	41	22	38	26	42	
	37		25		22		26	**UI**

r = rational.

s= stable.

u= unstable

UI = Unilateral Improvement.

E= Equilibrium.

X= Not Equilibrium

Fourth Scenario

Revolutionary SCAF, Compromising Mubarak With SCAF:

Under this scenario, SCAF will prefer to take a revolutionary stand rather than being an observer with two goals to be achieved from this. First, SCAF aims at changing the status quo due to the threat of the new political elite in the NDP, and SCAF's opposition to the power inheritance plan that might affect its political and economic interests. Second, SCAF wants to communicate its image of a revolutionary pro-people leadership so that it can guarantee a favorable position after the downfall of Mubarak, or gain popularity that will add to their political weight if he remained in charge. Accordingly, its preference vector will be as:

SCAF { 22 38 37 21 26 42 25 41 }

Although Mubarak prefers to stay in power, he also has a significant consideration for compromising to avoid direct confrontation with SCAF and high scale violent conflicts. He prefers outcomes where he can stay in power without SCAF's threat. However, if SCAF presents any threat that might lead to a conflict between presidency and army, he chooses to resign. Mubarak put less weight on conflicts with the protestors than SCAF, due to historical experience of crushing civil opposition. For Mubarak, the worst case scenario is to have both SCAF and the People against him while he insists not to resign which might lead to bloody conflict. Accordingly, his preference vector is:

Mubarak { 41 25 37 21 38 22 42 26 }

After 30 years of silence, protestors marched into the streets aiming at ending Mubarak's era. They prefer any outcome at which Mubarak resigns under any costs. They also prefer to achieve their goal with the least interference from SCAF so that they will not fall under a new military regime. However, if they failed to force Mubarak to resign, they would prefer outcomes that exert the highest possible pressure on Mubarak to force actual changes. Accordingly, they will have the following preference vector:

Protestors { 37 21 22 38 26 25 42 41 }

The stability analysis of the game leads to the identification of one equilibrium outcome at (22). SCAF will choose to support the revolution, Mubarak will resign, and the protestors will continue protesting. According to this scenario, the revolution outcome was a mix of the opposition of SCAF and the protestors, and Mubarak's desire of avoiding conflicts.

Stability Analysis for Fourth Scenario

SCAF

E	**X**	**X**	**X**	**X**	**X**	**X**	**X**	
r	**u**	**r**	**u**	**r**	**u**	**r**	**u**	
22	21	38	37	26	25	42	41	
	22		38		26		42	**UI**

Mubarak

X	**X**	**X**	**X**	**E**	**X**	**X**	**X**	
r	**s**	**r**	**s**	**r**	**u**	**r**	**u**	
25	21	41	37	22	26	38	42	
	25		41		22		38	**UI**

People

X	**X**	**X**	**X**	**E**	**X**	**X**	**X**	
R	**s**	**r**	**u**	**r**	**u**	**r**	**u**	
37	21	25	41	22	38	26	42	
	37		25		22		26	**UI**

r = rational.

s= stable.

u= unstable

UI = Unilateral Improvement.

E= Equilibrium.

X= Not Equilibrium.

Fifth Scenario:

Observer SCAF, Compromising Mubarak With Protestors:

In this scenario, SCAF prefers outcomes that exert the heaviest possible pressure on Mubarak without their direct interference. They prefer to change the status quo due to their opposition of the inheritance plan and the growing danger of the new elite in the NDP. However, due to uncertainty about revolution outcome and the risks of direct involvement in politics, they prefer to reach their goals while being observers rather than change imposers. Direct interference will be a last and less preferred resort to protect their interests. Accordingly, SCAF's preference vector will be:

SCAF { 37 21 22 38 25 26 42 41 }

Although Mubarak prefers to stay in power, he also has a significant consideration for preserving the Egyptian blood. He prefers outcomes where he can stay in power without *people's* threat. However, if the *people* present any threat that might lead to a conflict between presidency and the people, he chooses to resign. For Mubarak, the worst case scenario is to have both SCAF and the People against him while he insists not to resign which might lead to bloody conflict. Accordingly, his preference vector is:

Mubarak { 41 42 37 38 21 22 25 26}

After 30 years of silence, protestors marched into the streets aiming at ending Mubarak's era. They prefer any outcome at which Mubarak resigns under any costs. They also prefer to achieve their goal with the least interference from SCAF so that they will not fall under a new military regime. However, if they failed to force Mubarak to resign, they would prefer outcomes that exert the highest possible pressure on Mubarak to force actual changes. Accordingly, they will have the following preference vector:

Protestors { 37 21 22 38 26 25 42 41 }

The stability analysis of the game leads to the identification of two equilibrium outcomes at (21, 37). At the first outcome, SCAF will choose a neutral stand, Mubarak will resign, and the people will protest. At the second outcome, SCAF will be neutral, Mubarak will resign, and people will not protest. These outcomes indicate that Mubarak will choose to resign due to fears of conflict regardless of the effectiveness of civilian opposition, and SCAF will have no role in affecting the outcome.

Stability Analysis for Fifth Scenario

SCAF

E	**X**	**E**	**X**	**X**	**X**	**X**	**X**	
r	**u**	**r**	**s**	**r**	**u**	**r**	**u**	
21	22	37	38	25	26	42	41	
	21		37		25		42	**UI**

Mubarak

E	**X**	**X**	**E**	**X**	**X**	**X**	**X**	
r	**u**	**r**	**s**	**r**	**u**	**r**	**s**	
21	25	41	37	22	26	42	38	
	21		41		22		42	**UI**

People

E	**E**	**X**	**X**	**X**	**X**	**X**	**X**	
r	**s**	**r**	**u**	**r**	**u**	**r**	**u**	
37	21	25	41	22	38	26	42	
	37		25		22		26	**UI**

r = rational.

s= stable.

u= unstable

UI = Unilateral Improvement.

E= Equilibrium.

X= Not Equilibrium.

Sixth Scenario:

Revolutionary SCAF, Compromising Mubarak With Protestors:

Under this scenario, SCAF will prefer to take a revolutionary stand rather than being an observer with two goals to be achieved from this. First, SCAF aims at changing the status quo due to the threat of the new political elite in the NDP, and SCAF's opposition to the power inheritance plan that might affect its political and economic interests. Second, SCAF wants to communicate its image of a revolutionary pro-people leadership so that it can guarantee a favorable position after the downfall of Mubarak, or gain popularity that will add to their political weight if he remained in charge. Accordingly, its preference vector will be as:

SCAF { 22 38 37 21 26 42 25 41 }

Although Mubarak prefers to stay in power, he also has a significant consideration for preserving the Egyptian blood. He prefers outcomes where he can stay in power without *people's* threat. However, if the *people* present any threat that might lead to a conflict between presidency and the people, he chooses to resign. For Mubarak, the worst case scenario is to have both SCAF and the People against him while he insists not to resign which might lead to bloody conflict. Accordingly, his preference vector is:

Mubarak { 41 42 37 38 21 22 25 26}

After 30 years of silence, protestors marched into the streets aiming at ending Mubarak's era. They prefer any outcome at which Mubarak resigns under any costs. They also prefer to achieve their goal with the least interference from SCAF so that they will not fall under a new military regime. However, if they failed to force Mubarak to resign, they would prefer outcomes that exert the highest possible pressure on Mubarak to force actual changes. Accordingly, they will have the following preference vector:

Protestors { 37 21 22 38 26 25 42 41 }

The stability analysis of the game leads to the identification of two equilibrium outcomes at (22, 37). At the first outcome, SCAF will choose a revolutionary stand, Mubarak will resign, and the people will protest. At the second outcome, SCAF will be neutral, Mubarak will resign, and people will not protest. This scenario entails that the cooperation of SCAF and the people will lead Mubarak to resignation, or that he will choose this outcome willingly.

Stability Analysis for Sixth Scenario

SCAF

E	**X**	**X**	**E**	**X**	**X**	**X**	**X**	
r	**u**	**r**	**s**	**r**	**u**	**r**	**u**	
22	21	38	37	26	25	42	41	
	22		38		26		42	**UI**

Mubarak

X	**X**	**X**	**E**	**E**	**X**	**X**	**X**	
r	**u**	**r**	**s**	**r**	**u**	**r**	**s**	
21	25	41	37	22	26	42	38	
	21		41		22		42	**UI**

People

E	**X**	**X**	**X**	**E**	**X**	**X**	**X**	
r	**s**	**r**	**u**	**r**	**u**	**r**	**u**	
37	21	25	41	22	38	26	42	
	37		25		22		26	**UI**

r = rational.

s= stable.

u= unstable

UI = Unilateral Improvement.

E= Equilibrium.

X= Not Equilibrium

Conclusion:

The first two scenarios that assume Mubarak's persistent grab on power, and having "do not resign" as a strictly dominant strategy do not lead to the revolution outcome. Regardless of the stand of SCAF, Mubarak will remain in power. In the third and fourth scenarios, Mubarak will resign on condition that SCAF is pro-revolution. Although Mubarak puts more weight on SCAF's threats, a neutral stand of SCAF will not be sufficient for Mubarak to resign. This holds even if we considered the outcome of (Neutral, Resign, Give Up). This outcome indicates an optional resignation of Mubarak rather than a forced one as both SCAF and protestors are not playing any roles. In the last two scenarios, when Mubarak chooses to compromise for people, the revolution outcome will take place regardless of the stand of SCAF. There is also a possibility of optional resignation.

Moreover, these results provide insights about the conditions of reaching the revolution outcome. For the revolution to success, Mubarak will have to compromise with either SCAF, or the protestors. From the third and fourth scenarios, despite of the preferences of SCAF to be an observer or revolutionary, a pro-revolutionary action will be a must for a successful revolution if Mubarak chose to compromise with SCAF. This would be accompanied with effective protesting that would lead to the revolution outcome. Under Mubarak's willingness to compromise with SCAF, a neutral SCAF's stand would not be enough to achieve the goal of the revolution. From the fifth and sixth scenarios, Mubarak's willingness to compromise with the protestors would lead to a successful revolution regardless of SCAF's stand. This indicates that there is a possibility of a neutral stand of SCAF under the condition that Mubarak compromises with people while SCAF prefers to be an observer. It is also to be noted that optional resignation can be a way to resolve the conflict if SCAF prefers to be an observer, while Mubarak chooses to compromise.

In addition to the previous remarks, two important points have to be raised. First, the revolution outcome of Mubarak's resignation will not take place under any scenario such that SCAF is pro-revolution while people do not protest. Even if Mubarak puts more weight on avoiding confrontation with SCAF, he would not resign without people's protests. This negates any possibility of coup d'état that might lead to the revolution outcome. Second, protests can lead to the revolution outcome of Mubarak's resignation even if SCAF is neutral in the fifth scenario. Putting these two results together, protestors can achieve the revolution outcome by themselves without the support of SCAF, while the opposite does not hold. This is valid even if Mubarak compromises with SCAF which indicates that Mubarak puts more weight on protests than SCAF's interference.

In a nutshell, applying Fraser-Hipel technique of analyzing political conflicts on the Egyptian revolution provides useful insights about this highly debatable event in the Middle East. There is no evidence on Mubarak's absolute grab on power, but it is evident that he was willing to compromise to avoid confrontation with SCAF, or the protestors, or both. In addition, any claims of having a coup d'état are not supported by this analysis. SCAF was not able to push Mubarak to resign without the support of the protestors even when assuming that Mubarak perceived it to be more threatening to his authority. However, protestors exerted serious pressure on Mubarak that could have pushed Mubarak to resign

even if SCAF took a neutral stand. This indicates that Mubarak put more weight on protestors than SCAF as a threat. Furthermore, given a known non-optional resignation of Mubarak, there is a possibility of having a neutral stand of SCAF, but with limited probability of occurrence.

Although the analysis has provided many insights about the revolution, there are areas of further research. The model can be extended to incorporate more players. For instance, instead of dealing with the civil opposition as a homogenous entity, it can be tackled as different players that might have opposing interests among themselves. Opposition included the Muslim brotherhood, the liberals, the socialists, and the unaffiliated citizens. Some of these players have opposing goals which might affect their preferences and so the outcome of the game. Another extension can be assuming asymmetry of information among different players.

Table (2)

Scenario	**SCAF's Stand**	**Mubarak's Stand**	**Outcome**	**Strategy**
First	Observer	Uncompromising	Revolution fails	(Neutral, Do Not Resign, Protest)
Second	Revolutionary	Uncompromising	Revolution fails	(Pro-Revolution, Do Not Resign, Protest)
Third	Observer	Compromising with SCAF	Mixed outcome, or optional resignation	(Pro-Revolution, Resign, Protest) (Neutral, Resign, Give Up) (Neutral, Do Not Resign, Protest)
Fourth	Revolutionary	Compromising with SCAF	Successful revolution supported by SCAF	(Pro-Revolution, Resign, Protest)
Fifth	Observer	Compromising with People	Successful revolution without the support of SCAF, or optional resignation.	(Neutral, Resign, Protest) (Neutral, Resign, Give Up)
Sixth	Revolutionary	Compromising with People	Successful revolution supported by SCAF	(Pro-Revolution, Resign, Protest)

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