Effectiveness of Early Warning by International Organizations: Empirical Analysis on the United Nations Mission in South Sudan

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Abstract. How well can international organizations detect early warning signs of conflict escalation? Early warning system (EWS) is one of the core functions of the United Nations peacekeeping operations; however, despite its significance, the effectiveness of the system has not been empirically verified thus far. This research examines its effectiveness, focusing on the operational records of early warning activities by the United Nations Mission in South Sudan (UNMISS). Through building a dataset and using survival analysis, this study quantitatively estimates the effect of EWS to the duration of battles to understand how the system works to prevent conflict escalation. Contrary to expectations, the statistical result shows that the duration of battles tends to be longer if the peacekeeping mission responds to battles during or shortly after the events.

1 Introduction

Two actions essential to international organizations are monitoring what is occurring in the world and taking the measures necessary to address situations. Among the broad functions of international organizations, especially in the field of conflict prevention, early warning (EW) is considered as one of the significant mechanisms of the United Nations (UN) peacekeeping operations. Collecting information and analyzing the political and security environment in host countries and responding to the situations are considered key functions of UN peacekeeping operations, given some tragic failures of peacekeeping operations since the 1990s and the growing need for accurate intelligence to be used as a foundation for policy formation and the performance of effective operations. Thus, the UN has attempted to reinforce its EW capacities by releasing guidelines and establishing an EW system (EWS) within the organization (Abilova et al. 2016; Dorn 2004; Matveeva 2006; Ramjoué 2011; UN Department of Peacekeeping Operations 2006; Zenko et al. 2011).

However, despite the significance of EWSs, scholars and practitioners have not analyzed their effectiveness except for some early policy-analysis studies. This research empirically examines the effectiveness of EWS by focusing on one UN peacekeeping operation: the United Nations Mission in South Sudan (UNMISS). The unique operational environment in the world's newest country provided detailed data with which to evaluate the effectiveness of the mission's EWS. After examining each battle that has occurred in South Sudan and building a dataset on EW and early response (ER) taken by the mission, I quantitatively analyze how the mission's EWS affected the duration of each battle in South Sudan and inferred the effectiveness of the system in terms of preventing conflict escalation.

This paper is organized as follows. Section 2 describes the functions of EWSs in UN peacekeeping operations, their theoretical and operational background, and this study's hypotheses. Section 3 deals with the research design used to measure the effects of the EWS on the duration of battles, the explanation on variables and the coding rules used to build the dataset on the nation. Section 4 presents the results of statistical analysis and their interpretation. Lastly, Section 5 presents the study's conclusions and discusses prospects towards further rigorous empirical studies on the effectiveness of early warning by international organizations.

2 Early Warning System and UN Peacekeeping Operations

The concept of early warning itself is a broad one that is applicable to a wide range of fields; however, specifically within the UN and its peace and security activities, the term *early warning* refers to functions that warn of risks in political or security situations in a timely manner and respond to them effectively. Historically, the UN has worked to enhance its EW capabilities since the UN Secretary-General (SG) first created the Office for Research and Collection of Information (ORCI) in 1992, giving the office a clear EW mandate (Abilova 2016). Also in 1992, in a report titled "An Agenda for Peace," the SG stated the urgent need to develop a comprehensive and coordinated EWS (UN General Assembly 1992). In the field of peacekeeping, at the strategic level, "The UN Peacekeeping Operations: Principles and Guidelines (Capstone Doctrine)" by the Department of Peacekeeping Operations (DPKO) in 2008, clearly states the necessity of establishing an EWS in the context of conflict prevention. The guidelines state the following.

> *"Ideally, it [conflict prevention] should build on structured early warning, information gathering and a careful analysis of the factors driving the conflict. Conflict prevention activities may include the use of the Secretary-General's "good offices," preventive deployment or confidence-building measures* (UN DPKO and Field Support 2008)*."*

At the operational and tactical levels, the DPKO has developed detailed guidelines for an EWS, focusing on organizational settings and standard operating procedures. Within the UN's peacekeeping operations, the Joint Operations Office (JOC) and the Joint Mission Analysis Centre (JMAC) are typically responsible for short- and mid-term situational analysis, respectively. They inform EW data and provide intelligence that mission leadership uses to make decisions. Although they vary in organizational settings, all UN peacekeeping missions since 2006 have included institutionalized intelligence capacities for EW (UN DPKO 2006).

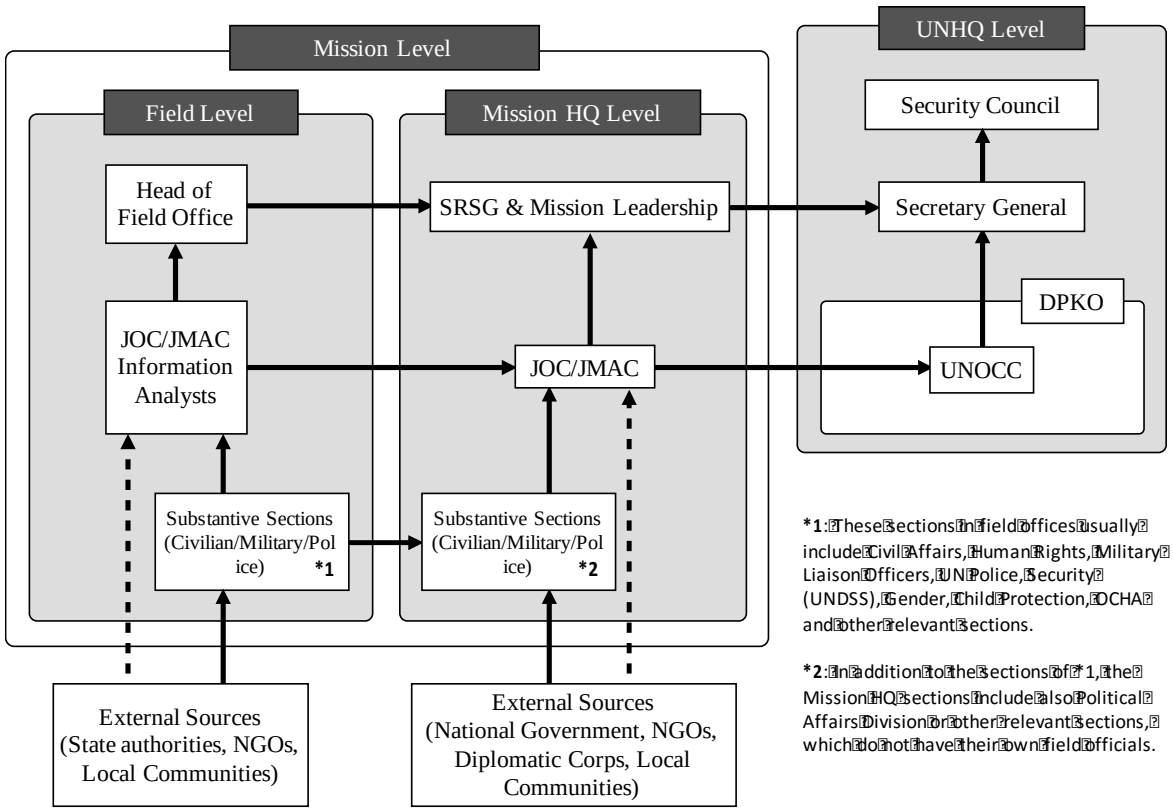


Fig. 1. Typical information flow of the EWS in UN peacekeeping operations (Edited by author based on Ramjoué 2011; UN DPKO 2006)

Figure 1 above shows an example of a UN EWS reporting line. Although the organizational setting of the responsible section depends on the mission and the operational environment, the flow depicted is typical of UN peacekeeping operations: data from field offices is analyzed by the responsible sections at the Mission Headquarters in host countries and then is delivered to the UN Secretariat in New York. In the case of UN peacekeeping operations, JOC officers in the field offices and the Mission Headquarters produce daily or weekly situational reports that are delivered to the UN Operations and Crisis Center (UNOCC), which was established in the DPKO in 2013. The SG and his office compile the data and periodically release individual reports on the countries hosting UN peacekeeping operations. Thus, these country reports or SG reports are to be seen as the final information products of the EWS of UN missions, which are publically available.

2.1 Existing Literature

The existing literature on EWS of international organizations examines their effectiveness by (1) comparing or examining the EWSs of broad organizations (Austin 2004; Barton et al 2008; Choo 2009; International Peace Support Training Centre 2014; Mateeva 2006; Zenko et al. 2011;) and (2) studying policies pertinent to specific EWS(s) (Abilova et al. 2016; Bowers 1996). The first type of research includes broad studies that academically analyze operations within the UN or regional organizations and academic projects. The second type of research includes policy-oriented research by scholars or practitioners who examined the details of each system, specified its limitations, and provided policy recommendations to improve the existing EWSs.

This paper deepens the earlier discussion on the EWS, focusing on the UNMISS. The Republic of South Sudan gained independence from the Republic of the Sudan on July 9, 2011. The UNMISS was established in response to this event and succeeded the prior UN peacekeeping operation in (northern) Sudan based on the United Nations Security Council Resolution 1996. The initial mandate of the UNMISS focused on state building; however, after a fierce conflict broke out in the capital city, Juba, in December 2013, the mission's mandate was revised to focus on protection of civilians (PoC) to deal with the severe influx of internally displaced persons (IDPs), physically protecting vulnerable communities. As of the end of 2017, the mission was one of the largest UN peacekeeping operations in the world, comprising 18,013 personnel, including 2598 civilians, 13,210 contingent troops, and 1,641 UN police (UN Peacekeeping 2017).

The UNMISS is one of the most appropriate missions through which to examine the UN peacekeeping operations' EWS, as it is the only mission that includes PoC sites at which the mission is mandated to provide physical protection to IDPs (UN Peacekeeping 2018). The existence of these sites makes the internal responses of the UNMISS much more visible than those of other missions, and this enables evaluation of how promptly the mission can respond to security developments. Because the UNMISS was established in 2011, well after the 2006 incorporation of JOC and JMAC into all missions, the present study assumed that the UNMISS had always had an operational EWS.

2.2 Theory and Hypotheses

Evaluating the effectiveness of an EWS requires empirically testing whether it has achieved the expected outcome; however, the earlier theoretical literature is limited, which explains the causal mechanism of international organizations' EWSs. Nevertheless, effective EWSs are largely supposed to include three stages: (1) successful collection and analysis of conflict data, (2) providing an EW message within the organization, and (3) enacting an ER based on the EW information (Matveeva 2006). In other words, if the EWS of the mission is working effectively, the mission should be able to predict the risks of a crisis as EW signs and take the necessary measures to respond to them in a prompt manner as ERs. In addition, as mentioned earlier, the strategic primary purpose of the UN's EWS should be apparently to prevent conflict (UN General Assembly 1992). Thus, to evaluate the effectiveness, it is necessary to test whether the activities within the

UN's EWS effectively prevented the recurrence of conflicts. This type of approach ("peace survival" analysis) that examines the correlation between the peacekeeping activities and the duration of conflict-related phenomena has been widely used by earlier "peacekeeping effectiveness" studies (Salvatore et al. 2017).

Based on the primary purpose and process of UN's EWS, I derive the following hypotheses, which will be used to empirically test the effectiveness of the EWSs of UN peacekeeping operations in terms of their effects upon conflict prevention.

Hypothesis 1: If the UN peacekeeping operation releases EW signs before the start of a battle, the battle will be shorter.

Hypothesis 2: If the UN peacekeeping operation enacts an ER to a battle, the battle will be shorter.

3 Research Design

To test the hypotheses above, this paper applies quantitative analysis, particularly survival analysis, utilizing collected data on the activities of UNMISS and an existing dataset on violence in South Sudan. By screening the backgrounds of events and building a dataset, this research estimates how much the EWS of UNMISS affects the duration of battle (time difference between the start and end date of each battle), which were observed in South Sudan.

The target of this research and data availability necessarily stipulate the time period and unit of analysis. As UNMISS was established on July 8, 2011 and South Sudan gained her independence on July 9, 2011, the range of analysis should be from the Independence Day (July 9, 2011) to the date of the latest events that are available as data, the end of 2017 (December 31, 2017). Regarding the unit of analysis, scholars typically use the duration of peace to operationalize conflict prevention and use conflict as the unit of analysis (Salvatore et al. 2017); however, as it is not feasible to operationalize the durations of ceasefires at the subnational level with the existing dataset, this study instead uses the duration of each battle, rather than of peace, to test these hypotheses. Thus, the unit of analysis is set to battle-day, it is necessary to see the effects of EW signs released by a specific UN mission and its responses toward specific battles on a daily basis.

3.1 Independent Variables

The independent variables of this research are: (1) Early Warning (EW) – whether UNMISS released EW signs before an event (battle) happened; and (2) Early Response (ER) – whether UNMISS operationally responded to the event. To collect information on these two variables, I used a series of UN Secretary General's reports (SG reports) on South Sudan and other related official documents, which the Mission Headquarters usually drafts and the UN Secretariat in New York completes based on the compiled situational reports from the field. The SG reports can be seen as a compilation of all situational reports provided by the mission and field offices, which contain records on how the mission perceived the situations and reacted to them. The reports are openly released and updated on the website of the United Nations Security Council (UNSC) as accessible official records on the mission's activities. Moreover, other official UN reports are also helpful for disclosing the actual EW and responses taken by the mission, including post-crisis investigation reports, UNSC presidential statements, and of course, the UNSC resolutions.

To read through the official documents released by the UNSC and extract data from them, this research deals with the two variables below as binary data and codes them in accordance with two different definitions for two variables (four in total) as shown below.

Table 1. Definitions of Independent Variables.

Variables	Narrow Definition	Broad Definition
Early Warning (EW)	Warning signs clearly mentioned in the SG reports or official UN documents ***for specific states/areas*** (EW1)	Warning signs mentioned in the SG reports or official UN documents ***for broader regions or risks*** (EW2)
Early Response (ER)	Activities to respond to a battle conducted only ***during*** the event are clearly reported in the SG reports or official UN documents (ER1)	Activities to respond to a battle conducted ***during and after*** the event are clearly reported in the SG reports or official UN documents (ER2)

Concerning the first independent variable, EW, the characteristics of EW signs that are recorded in the SG reports and other official UN documents differentiate the nature of these signs. Under the narrow definition of EW, in order to code that the UNMISS had released warning signs toward a specific potential battle before the event occurred, records of warning signs to specific states or areas should be clearly mentioned within the SG reports or other UN official documents. Examples of these clear EW signs can be sometimes found also in other official UN documents. By extracting the EW signs and detecting the specific battles to which the signs were supposed to refer, I coded the characteristics of this information as a dummy variable in the dataset.

For ER, the characteristics of the responses taken by the mission toward battles are diverse. The responses vary from the requisite minimum, such as merely strengthening engagement with the host government in hindsight, to the direct provision of force protection to IDPs even during an ongoing battle. Since the core mandate of UNMISS has been the protection of civilians, especially after the breakout of the nation-wide crisis in December 2013, the responses taken by the mission during or after the battles have basically focused on the provision of physical protection to vulnerable civilians who suffered from the deteriorated security situation.

3.2 Dependent Variables

The dependent variable of this analysis is the duration of each battle in South Sudan from July 2011 to the end of 2017. In the earlier studies of conflict prevention, scholars have empirically estimated the effectiveness of peacekeeping operations toward conflicts by analyzing the duration of *peace*, which can be defined as the time period from the date of signing a ceasefire agreement until the recurrence of conflict. However, for this analysis at the sub-national level, it is literally difficult to define when each battle ended and when the situation should be considered a ceasefire, since warring parties do not necessarily sign agreements at the subnational level. Although there were also *local* ceasefire agreements in some states or areas, which were enacted only among limited actors, the attempts were apparently not nation-wide efforts to maintain the ceasefire. It is difficult to operationalize the duration of *peace* to understand the effect of the EWS on the security situation at the sub-national level.

Thus, as the target of this analysis, I use data on the duration of *battle* instead, which can be compiled at the sub-national level throughout the aforementioned period. For this analysis, the dataset provided by the Armed Conflict Location and Event Data (ACLED) project is helpful to obtain comprehensive event data on conflicts within African countries (Raleigh et al. 2010). The dataset surely covers the range of this analysis with more than 3,000 recorded events in South Sudan, including three types of events: (1) violent events such as battles or violence against civilians, (2) demonstrations such as protests or riots, and (3) non-violent actions such as the non-violent transfer of territory or strategic developments.

Nevertheless, to detect the duration of each battle, the disaggregated collection of all events is insufficient, since the dataset does not tell the start and the end of each battle. In order to clean the

data to specify the duration of each battle, I applied the steps below to the original ACLED dataset on South Sudan:

(1) Excluded non-violent actions and events with less accurate time records;
(2) Grouped events that had the same event types, actors, and geographic coordinates as one battle and calculated the total fatalities of each battle;
(3) If there was no event for half of the months where one grouped event (battle) occurred, the next battle with the same event types, actors, and geographic coordinates was grouped as a different battle;
(4) Excluded battles with less than 25 casualties;[1] and
(5) Excluded battles in which one of the main actors was apparently under the strong influence of Sudan (non-South Sudanese actor)

After cleaning the dataset through the steps above accordingly, I detected 117 battles that occurred in South Sudan from July 2011 to December 2017 with specific data on the *duration of battle (time difference)*, which can be calculated as the number of days.

3.3 Control Variables

I added two control variables into the analysis: (1) the total number of fatalities in each battle, and (2) the type of UNMISS mandate (dummy variable). The former control variable, the number of deaths due to armed actions, is a standard variable to estimate the scale of a conflict. For this analysis, since the above-mentioned ACLED dataset contains the number of fatalities for each *event*, I calculated the total number of fatalities for each *battle* by combining the number of fatalities of all events, if the battle lasted more than two days.

Regarding the latter control variable, the UNMISS mandate, I added this to control for the characteristics of the mission, since the mandate was drastically changed after the crisis broke out in Juba between the main warring parties (SPLA and SPLA-IO) in December 2013. Since the establishment of UNMISS on July 8, 2011 until the crisis in December 2013, the UNMISS mandate focused on state-building activities for the newest country. However, due to the crisis, the UN soon revised the mandate and prioritized the protection of civilians by releasing UNSC Resolution 2132 in December 2013 and Resolution 2155 in May 2014, respectively. As I assume the change seriously affected the operational nature of EW and the expected responses taken by the mission, controlling for the change is helpful to estimate the effect of the EWS more precisely.

3.4 Method and Model

As the dependent variable of this analysis is the duration of each battle in South Sudan, I use survival analysis to estimate the effect of the EWS. The survival analysis, which is another name for *time to event analysis*, is helpful "where interest is on analyzing time to events such as clinical trials, job changes, marriage, the birth of children and so forth. (UCLA Statistical Consulting Group 2006)" As explained earlier, in conflict studies or political science, scholars have also applied the method to estimate the duration of peace. For this analysis, however, the events to be analyzed are to be the end of battle instead of the end of peace (recurrence of conflict).[2] In other words, I estimate how the EW and ER by UNMISS affect the survival of *battle*. Regarding the statistical model, I use Cox Proportional Hazards Model as one of the most common regression models to investigate the association between the predictor variables (independent variables) and the survival time (STHDA 2018).

[1] The coding rule for the number of casualties (less than 25 casualties) is based on the existing dataset, such as Uppsala Conflict Data Program & International Peace Research Institute (2017).
[2] For the example of existing studies that used the duration of peace, see Fortna (2004).

4 Analysis

4.1 Descriptive Statistics

The descriptive statistics show the characteristics of battles and the trends in South Sudan for the aforementioned time period since its independence. According to the dataset, at least within the definitions and coding rules explained in the previous section, 61 battles (52.1%) ended within one day, and 101 battles (73.5%) ended within one week (seven days). The longest battle lasted for 28 days in only two cases in Upper Nile and Jonglei states where the security situation has been volatile even shortly after gaining independence.

One of the most interesting things is that in Central Equatoria state, where the capital city of South Sudan (Juba) is located, only seven (7) battles occurred during the period. Among these battles, armed actions were observed precisely in Juba city in only four (4) cases. This means that the other 113 battles (96.6%) in South Sudan happened outside of the capital city. Despite the impact of the crises that have happened in Juba thus far, the number seems to be too small. However, a chronological examination of the trends might indicate that the few battles in Juba triggered the serious deterioration of the security situations in other states. The number reveals that the hot spots of fierce clashes have been actually scattered across the country, including rural regions such as Jonglei state with 32 battles (27.3%), Unity state with 27 battles (23.1%), and Upper Nile state with 19 battles (16.2%) out of 117 battles.

Regarding the independent variables, the data indicates that UNMISS could release EW signs within the narrow definition (specific warning) for 21 cases (17.9%), and within the broad definition (regional warning) for 90 cases (76.9%). For the ER, UNMISS took necessary responses within the narrow definition (during the battle) for 15 cases (12.8%), and within broad definition (during and after the battle) for 69 cases (58.9%).

Table 2. Descriptive Statistics of the Dataset

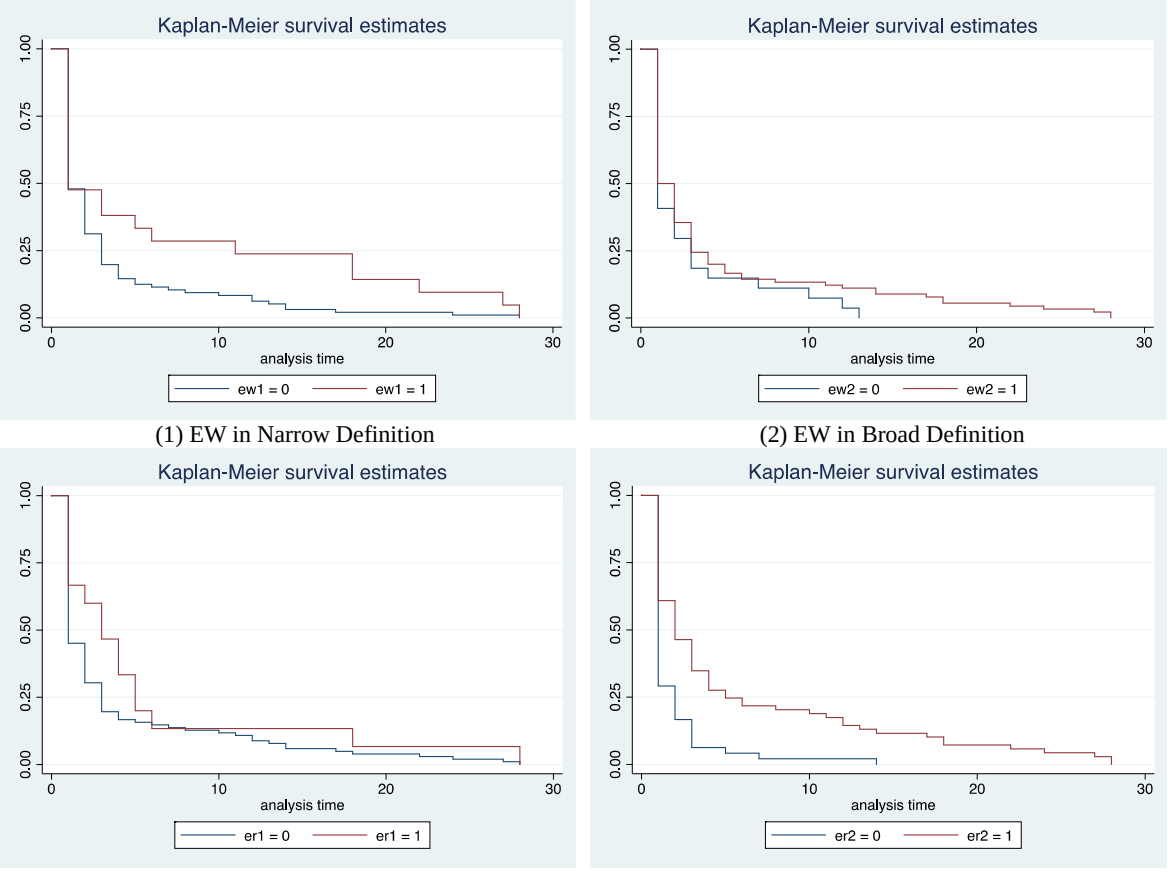
Variables	Observations	Mean	Standard Deviation	Minimum	Max
Duration of Battle	117	3.949	5.961	1	28
EW1 (Narrow)	117	0.179	0.385	0	1
EW2 (Broad)	117	0.769	0.423	0	1
ER1 (Narrow)	117	0.128	0.336	0	1
ER2 (Broad)	117	0.590	0.494	0	1
Total fatalities	117	94.265	112.994	25	752
Mandate	117	0.641	0.482	0	1

4.2 Kaplan-Meier Survival Estimates

In survival analysis, the Kaplan-Meier curves for independent variables help visualize the shape of the survival function (UCLA 2006). The x-axis is time and the y-axis is the proportion of subjects who survived. For this analysis, as the dependent variable is the duration of battles, the y-axis means the probability of battles continuing. In the graphs of Figure 2 below, the blue lines mean the probability of battles continuing when UNMISS conducts nothing for EW (ew1 and ew2 = 0) and ER (er1 and er2 = 0), and the red lines mean when UNMISS' activities are observed for EW (ew1 and ew2 = 1) and ER (er1 and er2 = 1) within each definition.

The graphs show that in all cases, the probability of battles continuing tends to be higher as a whole when UNMISS conducts EW or ER activities. What these curves tell seems to be totally

opposite to the hypotheses; in accordance with the graphs, when the EWS of UNMISS works effectively, the battles are likely to continue for a longer time period.



(1) EW in Narrow Definition (2) EW in Broad Definition

(3) ER in Narrow Definition (4) ER in Broad Definition

Fig. 2. Kaplan-Meier Survival Estimates.

4.3 Results and Interpretation

Table 3 below shows the results of this analysis, reporting the hazard ratios for the combinations of EW and ER within the two definitions. (1), (2), and (3) are models within the narrow definition, and (4), (5), and (6) are within the broad definition. On one hand, the results clearly show that the models within the narrow definition are not statistically significant, irrespective of EW, ER, or a combination of both. On the other hand, within the broad definition, the results show that the duration of battles tends to be longer if UNMISS responds to battles during or after the battle. This is a totally opposite result to the hypothesis that the escalation of violence will be less likely when the UN responds to deal with a battle. Although this analysis is only based on the cases in South Sudan, in which UNMISS was involved or should have been involved, the results appear to indicate that ERs taken by UN peacekeeping operations within the framework of the EWS do not help mitigate the risks of escalating violence in host countries.

Moreover, notwithstanding the statistical irrelevance, it is strange that all the hazard ratios are less than 1 even for EW. Of course, I can say nothing about the association between EW and the duration of battle within this analysis; however, at least, it should also be the case that the duration of battle might be longer when the UN mentions EW signs in its official reports if the data on the other missions are included.

Why were the results of this analysis opposite to the hypotheses? One of the most possible reasons for this would be the reverse causality between the independent and dependent variables. That is, *because* the battle itself had adequate potential to be much longer, the UN may have been

able to detect EW signs prior to the event, enabling it to prepare for the battle beforehand and respond to it in a prompt manner. Or, other factor(s) might have been overlooked that could affect both the UNMISS' activities within the EWS and the duration of the battle much more.

Another interpretation is that if the UN peacekeeping mission with the PoC mandate responds to a battle in a prompt manner, civilians around the battlefield would be more protected. If so, the warring parties might assume that their battle's negative effect toward their community members will be suppressed thanks to the UN, and they will continue to fight with no concern for their communities' well-being. Also, in the context of South Sudan, most of the civilians who are protected at the PoC sites are Nuer tribe, which has provided forces to the rebel group (SPLA-IO). The battle between the SPLA and SPLA-IO might be much longer if some of the SPLA-IO members can run into the PoC sites during the battle, using hit-and-run tactics. In that case, as the mission is able to provide protection as an ER, the battle can be prolonged and will not result in a decisive win in a short period.

At least, within the broad definition and analysis of the cases in South Sudan, I can say that the association between the ERs taken by the UN and the duration of battle is partly observable. This means that there could be a possibility for observers to predict that the duration of a battle could be longer if UN peacekeeping operations respond to the battle, for example, by deploying patrols or reinforcing troops to respond to the situation. In terms of the effectiveness of EWS, it can be also said that UNMISS has been able to efficiently respond to only the battles, which are likely to be protracted and have a severe impact on the security situation in South Sudan.

Table 3. Effects of UN Early Warning and Response to the Duration of Battle in South Sudan (Jul 2011- Dec 2017) Cox Proportional Hazards Model

	(1)	(2)	(3)	(4)	(5)	(6)
	Narrow Definition			Broad Definition		
Explanation	EW	ER	EW + ER	EW	ER	EW + ER
Early Warning (Narrow)	0.690		0.716			
	(0.181)		(0.201)			
Early Response (Narrow)		0.781	0.894			
		(0.226)	(0.277)			
Early Warning (Broad)				0.855		0.878
				(0.193)		(0.198)
Early Response (Broad)					0.557***	0.560***
					(0.116)	(0.116)
Total Fatalities	0.999	0.999	0.999	0.999	0.999	0.999
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
UN Mandate	1.121	1.185	1.118	1.204	1.185	1.182
	(0.237)	(0.246)	(0.236)	(0.247)	(0.244)	(0.243)
Observations	117	117	117	117	117	117

Hazard ratios are reported. Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

5 Conclusion and Future Prospects

Throughout this research, I examined the effectiveness of the EWS, focusing on the cases of UNMISS. However, in addition to the aforementioned potential issue of the reverse causality, there are several other methodological limitations in this analysis, which might question the validity of the results. Firstly, this analysis deals with only one specific country as the host country of a specific mission. It is not necessarily applicable to the other countries or areas, which host or have hosted peacekeeping operations with different types of mandates. As UNMISS mandate focuses on the protection of civilians after the December 2013 crisis in Juba, it is highly expected to take necessary measures to protect civilians who have suffered from deteriorated security situations. Moreover, for UN peacekeeping operations with traditional mandates such as ceasefire monitoring, the meaning of ER should be different from that of UNMISS. It is necessary for future research to expand the target of analysis to different host countries in order to confirm the more comprehensive empirical result.

Secondly, the potential incompleteness of data sources and how to deal with this can be also methodologically examined more deeply. In this analysis, reading through the official documents, dummy variables were coded by examining the characteristics of EW and the responses taken by UNMISS. However, the information on whether or not UNMISS actually warned or responded to battles is totally reliant on the official UN reports. If you intend to analyze the data more rigidly, the most ideal source would be the confidential information products within the organization. The reliability of news sources from ACLED itself is also questionable for some battles and might be biased in some cases, since the dataset is built based on the open news sources.

Despite these points to be improved in the future research, this study still contributes to empirically understand how the EW and ER of UN peacekeeping operations affect conflicts. As the primary purpose of the UN's EWS is conflict prevention, I assumed that at the operational level, if the mission conducted activities related to EW or ER, the duration of battles will be shortened. On the other hand, the statistical results demonstrated that when the mission responded during or after the battle, the duration of battle was likely to be longer. Although further theoretical and empirical analysis is required to infer its cause, the result of this study at least demonstrated the statistically significant association between the ERs by UNMISS and longer battles in South Sudan, which might be inconvenient consequences for the strategic goal of the EWSs in UN peacekeeping operations.

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