Toward a Responsible Global Power?
—A Formal Analysis of China’s Contributions to UN Peacekeeping Operations

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“Peacekeeping is not a job for soldiers but only a soldier can do it.”

— Dag Hammarskjold

The enormous growth of UN peacekeeping in the past three decades presents perhaps the most revealing evidence of the rise of the United Nations (UN) in maintaining international peace and security. Since the end of the Cold War, the UN peacekeeping operations (PKOs) have expanded both in quantity and complexity. Within five years from 1989 to 1994, for instance, the total number of peacekeepers increased almost seven times, from 11,000 to 75,000.\(^1\) During the Cold War, the UN never ran more than six PKOs in any given year. By contrast, between 1991 and 2015, on average there are seventeen ongoing PKOs each year under the UN supervision.\(^2\) In the meantime, the nature of UN PKOs also underwent significant changes. While “traditional” UN PKOs were predominantly tasked with cease-fire observation, the “second-generation” peacekeeping missions in the post-Cold War era are “multidimensional”, broadening their focus to a series of issues, such as institutions of governance, human rights protection, combatants disarmament and demobilization, etc., that are considered essential to “ensure the implementation of comprehensive peace agreements and to assist in laying the foundations for sustainable peace”.\(^3\)

Existing work has almost exclusively focused on the ability for peacekeeping to improve the duration of peace between the combatants (Diehl 1994; Doyle and Sambanis 2000, 2006; Walter 2002; Fortna 2004a, 2004b, 2008; Collier, Chauvet, and Hegre 2008;


\[^2\] Ibid.

Gilligan and Sergenti 2008; Mattes and Savun 2009). In contrast, only a few studies explore why and how these UN PKOs can be formed in the first place. The UN does not have its own military forces. It must rely on member states’ volunteer contributions for those tens of thousands of peacekeepers dispatched across the globe. Now the question is: why countries are willing to sacrifice the lives of their soldiers in those PKOs that might have no direct impacts upon their own countries? Moreover, how they select different levels of contributions to different UN PKOs. Even fewer studies examine the decision of some particular countries. In this study, we try to fill the gap by studying China’s UN PKO personnel contributions. In the remainder of the article, we first review the development of China’s UN PKO policy since 1970. Then we introduce the current status of formal analysis of UN PKO personnel contributions. Our analysis leads to a new supply-side rational choice allocation model on China’s UN PKO contributions. This model generates a number of hypotheses that are tested using the empirical data between 1990 and 2014. Our findings reveal some interesting features of China’s decision on UN PKO contributions.

**China and UN PKO**

Unlike most countries in the world, China’s initial impression of UN PKOs was hardly positive. The three-year bloody military conflicts during the Korean War convinced Chinese leaders that peacekeeping operations are nothing but disguises for interventions into other countries’ domestic affairs. It is therefore not surprised that China’s UN PKO policy in the 1970s was featured on the principle of “three-NOs”: not to vote on (abstain from), not to pay for, and not to participate in UN PKOs (Chen, 2009). Such a hostile position started to soften in the 1980s when China’s reform and open-up policy not only required a peaceful and secure external environment for China’s economic development
but also generated more connections between China and the rest of the world. In 1981, China, for the first time, voted in favor of a UN PKO (UNFICYP in Cyprus), marking an end of its no-voting policy. Later in the year, its no-payment policy was ended when China agreed to share the financial costs of UN PKOs. However, it took a much longer time for China to change its non-participation policy. Because of the inherent inconsistency between UN peacekeeping operations and China’s cherished principle of non-intervention, China was always cautious of sending any military personnel to other countries.

The end of the Cold War completely altered the external condition for China’s calculation over UN PKO contribution. As the UN became more assertive in international politics, peacekeeping missions are more critical to global peace and security. Accordingly, China realized new values from its participations in UN PKOs both to elevate its own international profile and to counterbalance the looming US dominance. In 1989, Chinese civilian officials were sent to the UNTAG. In 1990, China dispatched five military observers to the UNTSO. In 1992, another substantial step was made when China sent its first military forces—800 People’s Liberation Army engineering troops—to the UNTAC. The following years witness China’s rapid growth of its UN PKO contributions. As showed in Figure 1, China’s annual average UN PKO contributions have jumped from 5 in 1990 to 2,622 in 2016. In the meantime, its share of total UN peacekeepers has elevated from .048% (1990) to 2.735% (2016).

China’s active engagement to UN PKO is also reflected into the structure of its personnel contribution. If we can break down China’s personnel contributions into three categories: military observers, civilian police, and military troops, Figure 2 lists the ratio of Chinese peacekeepers in each category. As we can see from the figure, a conspicuous trend in China’s contribution is the increase in China’s military troops.
While in the 1990s and early 2000s, China tends to dispatch more civilian police, the focus has shifted to military troops, another sign of China’s deepened involvement in this participation in UN PKOs. Currently, China has established two training facilities for its peacekeepers. In 2007, Major-General Zhao Jingmin became the first Chinese commander of a UN PKO (MINURSO in Western Sahara).

Compared with other major countries in the world, China has become one of the most significant participants of UN PKO in terms of both number of missions and number of peacekeepers. In Figure 3 and 4, we list the number of PKOs as well as the total peacekeepers the five UN Security Council permanent members and India have participated since 1990. As we can see, China has replaced France as the UN Security Council permanent member with the widest coverage (numbers of PKOs) and deepest commitment (number of peacekeepers per operation). But China’s contribution is still far below the level of India.
Figure 2: Structure of China’s UN PKO Personnel Contributions (2010-2017)

Figure 3: Number of PKOs Major States have Participated (2010-2017)
It should be pointed out that it is true that Africa has become China’s most interested area in China’s PKO contribution. In Figure 5, it is very clear that China’s contributions to all peacekeepers deployed in the region has increased to almost 2.5% recently. However, if we compare the way all countries allocate their peacekeepers between Africa and other regions of the world, the conclusion is different. As demonstrated in Figure 6, where the percentages of China and other countries African UN PKO contributions are compared, we can see that whereas China occasionally surpassed the rest of the world in the last century, this share has been consistently below the average of all other countries in the new century. In conclusion, it is true that China has enhanced its presence in Africa, as many studies pointed out (Rogers, 2007; Wu and Taylor 2011; Ayenagbo et al., 2012). Yet we should not exaggerate the status of Africa in China’s UN PKO strategy. The empirical data shows China also boosts its contribution in UN PKOs in other areas of the world, even at a faster pace.
Figure 5: Share of China’s Peacekeepers in African UN PKOs (2010-2017)

Source: IPI Peacekeeping Database.

Figure 6: Share of Peacekeepers between African and Non-African UN PKOs (2010-2017)

Source: IPI Peacekeeping Database
According to *China’s Military Strategy* issued by in May 2015, ⁴

“China’s armed forces will continue to participate in UN peacekeeping missions, strictly observe the mandates of the UN Security Council, maintain its commitment to the peaceful settlement of conflicts, promote development and reconstruction, and safeguard regional peace and security. ... China’s armed forces will engage in extensive regional and international security affairs, and promote the establishment of the mechanisms of emergency notification, military risk precaution, crisis management and conflict control. With the growth of national strength, China’s armed forces will gradually intensify their participation in such operations as international peacekeeping and humanitarian assistance, and do their utmost to shoulder more international responsibilities and obligations, provide more public security goods, and contribute more to world peace and common development.”

Our discussion depicts a general picture of China’s involvement in UN PKOs in the past three decades. However, one question remains: How can we understand the variations between China’s contributions to these UN PKOs? In other words, why China tends to make more contributions to some PKOs yet less to others? What are the factors that help us understand China’s decision on the level of participation of each UN PKO? Despite their enormous contributions to our knowledge, almost all extant studies fail to address these issues. In the next section, we will present a rational choice model on China’s UN PKO participation.

**Formal Analysis of UN PKO Contributions**

While formal models are widely used by scholars in their examination about states’ behavior in international relations, such as their decision to initiate, continue, and terminate wars,⁵ formal analysis of states’ contributions to UN PKOs are in short supply. Existing studies usually adopt one of the following two approaches. Nevertheless, as we

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⁵See Ye (2012) for a complete literature review.
will demonstrate in details below, neither approach has offered a satisfactory solution to explain our observations of states’ UN PKO personnel contributions in the post-Cold War era.

The Third-Party Intervention Model

The first approach is based on Regan’s (1998) canonical model of third-party intervention. For instance, Bove and Elia (2011) assert, following Regan (1998), the key to understanding a state’s decision to contribute to a UN PKO is its calculation about the prospective benefits and costs. Specifically, if we use $EU^I_i$ and $EU^N_i$ to represent a state $i$’s expected utility from participating and non-participating, respectively, we have

$$EU^I_i = q(U^S_i) + (1 - p)U^F_i - \sum C_i^I,$$  \hspace{1cm} (1)

and

$$EU^N_i = p(U^P_i) + (1 - p)U^C_i.$$  \hspace{1cm} (2)

In equation (1), $U^S_i$ and $U^F_i$ are $i$’s utility from UN’s successful (with probability $q$) and failed intervention (with probability $1 - q$), and $C_i^I$ is the costs of intervention. In equation (2), $U^P_i$ and $U^C_i$ are $i$’s utility from the two outcomes without its participation: successful settlement (with probability $p$) and continued conflict (with probability $1 - p$). The essence of this approach is that the necessary condition for state $i$ to participate in UN PKOs is that the expected utility of doing so must outweigh non-participation, or,

$$EU^I_i > EU^N_i.$$  \hspace{1cm} (3)

Despite the intuitive sense it makes, Regan’s (1998) third-party intervention model is not a good fit for our inquiries into states’ personnel contributions to UN PKOs. For
Regan’s third-party intervention model to work, two preconditions must be satisfied. First, the potential intervening states should have very high stakes in the target conflict. In plain words, the outcomes matter to potential interveners, or using the term in the model, it suggests

\[ U_i^s >> U_i^f \text{ and } U_i^p >> U_i^c. \]  

(4)

Second, their interventions should have significant impacts upon the outcomes, or in plain words, they must be able to make a difference:

\[ q >> p. \]  

(5)

Unfortunately, neither is necessarily the case for states’ participation in UN PKOs. For the first condition (equation 4), according to the IPI Peacekeeping Database,155 states across the world participate in a total of 78 UN PKOs between 1990 and 2017. It is fair to say few of these countries have vital interests in places further away from their neighboring area. Even Bove and Elia (2011) have acknowledged that most of countries are indifferent about the outcomes of peacekeeping operations, namely

\[ U_i^s \sim U_i^f \text{ and } U_i^p \sim U_i^c. \]  

(6)

Furthermore, as showed in Table 1, top UN PKO contributors such as Pakistan, Bangladesh, India, and Nepal, etc., dispatched tens of thousands to troops every year to regions (e.g., Africa) where they have little, if any, interest. The situation of the second condition is no less puzzling. Our analysis of the post-Cold War UN PKOs data shows that those 155 states, on average, contribute from 1 to 5,972 peacekeepers to UN PKO.\(^6\)

\(^6\)The latest data is in March 2017.

\(^7\)Note that the average contributions only involve those years they participated in at least one UN PKO.
Table 1: UNSC Permanent Members and Other Top Contributors to UN PKOs  
(annual average, 1990-2017)

<table>
<thead>
<tr>
<th>Ranking</th>
<th>State</th>
<th>Contributions</th>
<th>Ranking</th>
<th>State</th>
<th>Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pakistan</td>
<td>5972</td>
<td>14</td>
<td>Senegal</td>
<td>1281</td>
</tr>
<tr>
<td>2</td>
<td>Bangladesh</td>
<td>5567</td>
<td>15</td>
<td>Morocco</td>
<td>1141</td>
</tr>
<tr>
<td>3</td>
<td>India</td>
<td>4857</td>
<td>16</td>
<td>China</td>
<td>1041</td>
</tr>
<tr>
<td>4</td>
<td>Ethiopia</td>
<td>3959</td>
<td>17</td>
<td>Indonesia</td>
<td>932</td>
</tr>
<tr>
<td>5</td>
<td>Rwanda</td>
<td>3609</td>
<td>18</td>
<td>Kenya</td>
<td>891</td>
</tr>
<tr>
<td>6</td>
<td>Nepal</td>
<td>2652</td>
<td>19</td>
<td>Italy</td>
<td>885</td>
</tr>
<tr>
<td>7</td>
<td>Nigeria</td>
<td>2562</td>
<td>20</td>
<td>Brazil</td>
<td>879</td>
</tr>
<tr>
<td>8</td>
<td>Ghana</td>
<td>2216</td>
<td>21</td>
<td>UK</td>
<td>867</td>
</tr>
<tr>
<td>9</td>
<td>Jordan</td>
<td>2074</td>
<td>22</td>
<td>Burkina Faso</td>
<td>800</td>
</tr>
<tr>
<td>10</td>
<td>France</td>
<td>1632</td>
<td>23</td>
<td>Saudi Arabia</td>
<td>747</td>
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<tr>
<td>11</td>
<td>Egypt</td>
<td>1517</td>
<td>24</td>
<td>Argentina</td>
<td>745</td>
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<td>12</td>
<td>South Africa</td>
<td>1490</td>
<td>38</td>
<td>US</td>
<td>534</td>
</tr>
<tr>
<td>13</td>
<td>Uruguay</td>
<td>1371</td>
<td>44</td>
<td>Russia</td>
<td>421</td>
</tr>
</tbody>
</table>

Source: IPI Peacekeeping Database.

Nevertheless, with 70 states contributing less than 100 peacekeepers and 30 countries less than 10,\(^8\) it is hard to argue that these countries believe their contributions can alter the peacekeeping outcomes in any meaningful ways.

Because most countries fail to meet the two conditions for Regan’s third-party intervention model, its application in the analysis of their UN PKO contributions could lead to a conclusion akin to the renowned “paradox of voting” (Downs 1957): since they do not care about the outcomes and do not make any difference, if they are rational, they should not contribute at all. But they do. Most of the UN members have dispatched their troops to various UN PKOs during the past 28 years.

\(^8\)The national average annual contributions are badly skewed with the mean of 470 and the median of 145.
The Public-Private Goods Model

Although on the surface, states’ decision to participate in the UN PKOs appears a form of third-party intervention, it essentially involves a quite different type of decision: the key is not “whether” but “how many” to contribute. Regan’s third-party intervention model is a natural extension of the tradition of rationalist explanation for war (Bueno de Mesquita, 1981; Fearon, 1995). Its focus is exclusively on the initiation of a war—from the perspective of the potential intervener though. By contrast, a state’s UN PKO contributions usually do not involve “initiating” the PKOs per se, which was decided by the UN Security Council, but the particular number of contributors. To a state, the decision not to contribute is actually a choice of zero personnel contribution, one of the numerous options available to a country. From this perspective, by focusing on the number of contributors, the second approach, the public-private goods model, begins with the right question to ask. In its analysis of states’ calculations with respect to its UN PKO contributions, this approach selects to delve into the specific benefits and costs associated with UN PKOs.

Without question, the most significant function of UN PKOs is to maintain international peace and security, thereby creating public goods that are universally consumed by all countries in the world. Furthermore, in the post-Cold War era, UN’s multidimensional PKOs involve the following additional tasks, according to the UN Department of Peacekeeping Operations (DPKO), which include “facilitating the political process, protecting civilians, assisting in the disarmament, demobilization and reintegration of former combatants; supporting the organization of elections, protecting and promoting

9Note that the difference between the two is not absolute. In the case of multi-state joint intervention, such as intervention by regional IGOs, the state’s decision involves both models. See Mullenback (2005) for more information on different types of intervention.

human rights and assisting in restoring the rule of law”. Although these are largely “impure” public goods that are usually consumed by all countries in an unequal way Bobrow and Boyer (1997), they indubitably constitute another component of states’ rational calculation. Finally, UN PKOs can generate private goods attained by specific contributing states. For instance, the UN compensates states for both their peacekeeping soldiers, equipment, and self-sustainment services, which in the eyes of some developing countries is a significant source of revenue. Some states may have special political and economic interests in countries or regions where a PKO is performed. Some states may view UN PKOs as an instrument to elevate its national reputation. According to the public-private goods model, the nature of the decision of UN PKO contributions is to figure out the number of peacekeepers that maximizes a state’s utility. For instance, Gaibulloeu, Sandler and Shimizu (2009) develop the following model to examine state $i$’s total PKO contributions:

$$U^i = U^i(y^i, x^i_N, Z^i_N, E^i),$$

where $i$’s utility ($U^i$) is determined by the public goods ($Z^i_N$), impure public goods ($X^i_N$), and private goods ($E^i$) generated by the PKO, as well as its remaining military forces ($y^i$). Therefore, $i$’s contribution $q^i > 0$ should be the one that maximizes $U^i$, or

$$q^i = max\{q^i(y^i, q^i, q^i + \tilde{Q}^i, E^i), 0\},$$

subject to $q^i + y^i = I$, where $\tilde{Q}^i$ is the total contributions from other countries and $I$ stands for $i$’s total available armed forces.

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12It should be noted that their original model includes both UN and non-UN PKOs. Furthermore, states’ PKO contributions ($q^i$, $y^i$, and $\tilde{Q}^i$, $I$ in equation 8) are presented in their monetized forms.
Compared with the third-party intervention model, the biggest advantage of the public-private goods model is it presents a theoretical framework to assess states’ particular UN PKO contributions. Nevertheless, although Gaibulloeu, Sandler and Shimizu (2009) correctly point out a state’s PKO contribution is essentially an optimization problem—the contribution that maximizes its utility, they fail to specify what is the optimal contribution, not to mention how this optimal contribution is affected by the contributing country’s internal and external characteristics. As a result, their model is merely a conceptual configuration of states’ decision and cannot be tested by empirical data.\footnote{Gaibulloeu, Sandler and Shimizu (2009) have to establish a separate statistical model for empirical analysis.} The main reason for their deficiency is because of their ignorance of the fact that a state has to decide to contribute to multiple UN PKOs simultaneously. Between 1990 and 2017, on average there are more than seven PKOs. States do not select the total (annual) contributions, but the specific contribution to individual peacekeeping operations. In other words, the basic unit of analysis should be individual PKOs, although the contribution to each PKO is constrained by the state’s total available peacekeepers. Therefore, states’ decision to contribute to UN PKOs is actually how to allocate its scarce resources—namely, their available peacekeepers—among these PKOs. The decision is more similar to an issue of portfolio management: select the best investment mix with optimal return.

**The Allocation Model**

In their inquiry of South Korea’s personnel UN PKO contributions, Ye, Heo and Li (2017) propose a supply-side rational choice model on South Korea’s allocation of its troops to various UN PKOs. Compared to the formal models introduced above, their allocation model has at two distinctive advantages. First, the unit of analysis is a
PKO-year dyad. Since UN PKOs vary widely in location, duration, risk, as well as size, this setup allows researchers to closely check the impacts of these features on states’ decision. Second, this is both a conceptual and empirical model. With their model, Ye, Heo and Li (2017) simulate how South Korean decision makers determine the level of personnel contribution based on the public/private benefits associated with each peacekeeping operation. They also spell out the optimal level of contribution and look into its relationship with a handful of factors. Each of the conclusions leads to a hypothesis about how various variables can affect South Korea’s contribution to a UN PKO in a given year. Although this model is intended to analyze how South Korea, a growing middle power, has played an active role in global affairs, the core of the model does not rely on any presumptions that are unique to South Korea. Since the fundamental rationale of states’ calculations on their UN PKO contribution should not vary dramatically, we believe the basic research design of Ye, Heo and Li (2017) can be applied to other countries as well. In the remainder of this section, we will present the allocation model to case of China’s UN PKOs contribution. As we will demonstrate shortly, while revisions are made wherever necessary to accommodate China’s particular situation, the general layout of the allocation model remains largely unchanged.

If we use $U^j$ to denote China’s utility from a particular UN PKO, say, $j$, $U^j$ can be written as a function of a series of factors that capture various aspects of China’s assessment of UN PKO $j$:

$$U^j(x^j, y^j, z^j, c^j).$$  

*Public Goods* ($x^j$) $x^j$ represents the public goods generated by PKO $j$, namely, international peace and security. It may also include the enhancement of the status and effectiveness of UN in international politics, as well as the resolution and prevention of humanitarian disasters (Blechman, 1995). Let $t^j \geq 0$ and $T^j > 0$ represent the
peacekeepers contributed by China and all other countries. The public goods of UN PKO $j$ can be expressed as

$$x^j = \alpha_j(t^j + \tilde{T}^j) \frac{t^j + \tilde{T}^j}{R^j}.$$  \hspace{1cm} (10)

In equation (10), $R^j$ is the level of resistance of the operation, which is proportional to the power of the hostile forces. Therefore, $\frac{t^j + \tilde{T}^j}{R^j}$ denotes the chance of a successful PKO $j$. Finally, $\alpha_j > 0$ is the coefficient that captures the positive relationship between the public goods and the two factors (total number of peacekeepers, $t^j + \tilde{T}^j$, and the chance of success, $\frac{t^j + \tilde{T}^j}{R^j}$). Recall that, as public goods, $x^j$ should be consumed by all countries regardless their level of participation of PKO $j$. However, our above discussions also suggest the public goods might be impure, meaning China may consume the public goods from some PKOs more efficiently than from others. In our model, such difference is represented by the coefficient: ceteris paribus, a greater $\alpha_j$ implies more public goods from the peacekeeping operation.

*Private Goods ($y^j$)*

PKO $j$ also creates private goods that are particular to individual contributors. Shimizu and Sandler (2002) specify UN PKOs’ three country-specific benefits: enhancing contributors’ global status, protecting their neighboring countries’ stability, and promoting economic benefits for their trading partners. Nevertheless, for a rising global power such as China, UN PKOs may bring about more private goods. For instance, active participation into UN PKOs demonstrates China responsibility to international peace and stability, a very useful footnote for China’s strategy of peaceful rise and development.\textsuperscript{14} China may use UN PKOs to protect its investment in Africa (Ayenagbo et al., 2012), or punish countries that attempt to flirt

\textsuperscript{14}\textsuperscript{14}See Cho and Jeong (2008) for a thorough introduction and analysis about China’s peaceful rise/development strategy.
with Taiwan.\footnote{In 1999, China used its veto in the UN Security Council to renew the peacekeeping operation in Macedonia because of its relationship with Taiwan (Pang, 2005).} UN PKOs also provide the opportunity for China to train its military forces, test its equipments, communicate with the military from other countries Rogers (2007). All these are necessary for China’s ability to project military power around the globe. Finally, although there is no evidence about China’s sensitivity about the cost to train, dispatch, and deploy its blue-helmet soldiers, the United Nations’ generous monetary compensation to contributing countries does influence China’s calculation of the economic consequences of its UN PKO participations To model China’s assessment of UN PKOs’ private goods, we have

\begin{equation}
    y^j = \beta_j t^j + \frac{T^j}{R^j},
\end{equation}

where $\beta_i$, like $\alpha_i$, is the positive coefficient about the relationship between China’s contribution ($t^j$), the chance of successful PKO ($\frac{t^j+T^j}{R^j}$) and China’s specific benefits from the operation ($y^j$). Compare equations (11) and (10). We can see China’s contribution ($t^j$) exerts independent impact upon its private benefits ($y^j$), whereas it only matters as one of the contributions in equation (10).

**Opportunity Costs** Of course, contributing to UN PKOs is not costless. Our model includes two types of costs in China’s calculation. The first is the opportunity cost attached to each UN PKO. Like all countries in the world, military forces are a scarce resource in China. The more China contributes to one UN PKO, the fewer troops left for its own national defense and other peacekeeping missions. If we use $M$ to denote China’s total armed forces, China’s utility from remaining military forces is written as

\begin{equation}
    z^j = \gamma_j (M - t^j),
\end{equation}
where $\gamma_j > 0$ is the coefficient about the scale of the opportunity costs from PKO $j$. Note that the opportunity cost is expressed as an element of China’s utility of remaining armed forces, the negative sign of $t_j$ in equation (12) implies $z^j$ decreases in $t^j$.

**Cost of casualties ($c^j$)** The second item of costs regards casualties in UN PKOs. Despite a basic principle of UN peacekeeping is “non-use of force except in self-defense and defense of the mandate,” no one can deny the reality that peacekeeping operations are risky business. Since the end of the cold war, more than 2,400 peacekeeping soldiers have been killed in the UN PKOs.\(^\text{16}\) To capture how China assesses the possible casualties of its peacekeepers, we present the following equation:

$$c^j = -\delta_i t^j R^j (\text{VSL}).$$  \((13)\)

In equation (13), the cost of a peacekeeper’s life is measured using the value of a statistical life (VSL), a concept widely adopted in study of public policies. It is true that human life is priceless. But this does not mean decision makers are willing to assign unlimited resources to diminish the risk to people’s life. In short, the VSL focuses on “the willingness of people to trade off wealth for a reduction in the probability of death” (Ashenfelter, 2006, 10). In addition, the total costs of casualties is affected by the number of peacekeepers ($t_j$) as well as the level of resistance of the PKO ($R^j$). The particular relationship is captured by $\delta_j > 0$. It is worth reiterating that since the UN compensate member states for their personnel contributions, equation (13) does not include economic costs.\(^\text{17}\)


\(^{17}\)Furthermore, the UN PKOs have their own budget. Like countries’ financial contributions to the UN budget, states’ financial contributions are mandatory and the share is determined by the UN. For instance, in the 2016-17 fiscal year, China contributed about 10.29% of the total UN peacekeeping budget, next only to the US, which is 28.57%.
Because each element in equation (9) can be further expressed as a function of China’s particular contribution to each PKO in a particular year, \( t^j \), we can figure out China’s particular contribution as an optimization problem: China’s optimal contribution is the one that maximizes China’s utility, \( U^j \). If we adopt the normal assumptions about China’s utility function, that is, \( U^j \) is continuous, twice differentiable, quasi-concave (Kreps, 1990), and strictly increasing in the private and public goods and strictly decreasing in the two cost terms (namely, \( \partial U^j / \partial x^j > 0 \), \( \partial U^j / \partial y^j > 0 \), \( \partial U^j / \partial z^j > 0 \), and \( \partial U^j / \partial (-c^j) > 0 \)), we can spell out the following first-order condition:

\[
2 \alpha^j (t^j + \tilde{T}^j) \frac{\partial U^j}{\partial x^j} + \beta^j (t^j + \tilde{T}^j) \frac{\partial U^j}{\partial y^j} - \gamma^j \frac{\partial U^j}{\partial z^j} - \delta^j R_j (VSL) = 0. 
\]

(14)

The solution is China’s optimal contribution to PKO \( j \):

\[
t^{j*} = \frac{\delta^j (R^j)^2 (VSL) + \gamma^j R^j \frac{\partial U^j}{\partial x^j} - 2 \alpha^j \tilde{T}^j \frac{\partial U^j}{\partial x^j} - \beta^j \tilde{T}^j \frac{\partial U^j}{\partial y^j}}{2 \alpha^j \frac{\partial U^j}{\partial x^j} + 2 \beta^j \frac{\partial U^j}{\partial y^j}},
\]

subject to \( t^j \geq 0 \).

Since equation (15) involves quite a few unknowns, it is unable to tell us how many troops China will contribute to a particular PKO. However, because this equation specifies the relationship between a handful of factors and China’s contribution, it will generate significant insights into how these factors would affect China’s UN PKO contribution. In the next section, we will probe into the impacts of these factors. Our analysis will lead to a number of hypotheses on China UN PKO contributions.

**Hypotheses on China PKO Contributions**

*Costs of Casualties (VSL)*

Probably the most counter-intuitive finding from equation (15) is about the impacts from costs of casualties. Presumably, higher costs of
casualties would discourage countries from sending more peacekeepers. This argument is also supported by some empirical analysis of UN personnel contributions Bove2011. The other side of coin is higher VSL is closely related to more advanced economies, which, as discussed shortly, are more likely to consume UN PKOs public and private goods more efficiently. What is at stake here is how to weigh the positive and negative returns from a state’s PKO contributions. In equation (15), it is easy to see that

$$\frac{\partial \nu^*}{\partial (VSL)} = \frac{\delta_j (R_j)^2}{2\alpha_j \frac{\partial U_j}{\partial x_j} + 2\beta_j \frac{\partial U_j}{\partial y_j}} > 0.$$  

(16)

It suggest that China’s optimal contribution increases in the VSL. Therefore, we have the following hypothesis on the cost of casualties:

**Hypothesis 1** The higher the personnel costs, the more China’s PKO personnel contributions are expected.

**Other Countries’ Contributions (T̃j)** When a country determines its level of contribution to a UN PKO (say, t̃j), what is the impact of the contributions from other countries (i.e., T̃i)? Theoretically, large contributions from other countries create two opposite incentives. On the one hand, the country might be encouraged to contribute more troops because large contributions from other countries make a PKO more likely to succeed (recall the chance of success is $\frac{t_j + \tilde{T}_j}{T}$). On the other hand, because the total number of each PKO is fixed, decided by the UN Security Council, large contributions from other countries mean lower level of demand as well as relevance.\(^{18}\)

\(^{18}\)While the process for countries to pledge their personnel contributions is akin to a simultaneous game, few UN PKOs have ever reached the upper limit set by the Security Council. In other words, a state can always contribute more troops if it is willing to do so.
From equation (15), we can see that
\[
\frac{\partial t^j}{\partial \tilde{T}^j} = \frac{-2\alpha_j - \beta_j}{2\alpha_j \frac{\partial U_j}{\partial x_j} + 2\beta_j \frac{\partial U_j}{\partial y_j}} < 0,
\] (17)
suggesting the negative incentive is dominant. Therefore, we have the following hypothesis:

**Hypothesis 2** The higher the contributions from other countries, the less China’s PKO personnel contributions are expected.

Marginal Value of Public/Private Goods ($\frac{\partial U_j}{\partial x_j}$ and $\frac{\partial U_j}{\partial y_j}$)

In equation (15), $\frac{\partial U_j}{\partial x_j}$ and $\frac{\partial U_j}{\partial y_j}$ denote the marginal effects of a PKO’s public and private goods, or how efficiently these goods can be consumed by China. In both cases, we have
\[
\frac{\partial t^j}{\partial U_j} < 0 \text{ and } \frac{\partial t^j}{\partial U_j} < 0,
\] (18)
suggesting negative relationships between China’s personnel contributions and these two marginal values. Therefore, if we can find out the situations where China’s consumption of UN PKOs’ public/private goods is more efficient, hypotheses can be derived regarding the relationship between China’s personnel contribution and these situations.

So the question is: when China is supposed to consume these public/private goods more efficiently? First, as for public goods, we argue that China’s efficiency is directly associated with its level of globalization. Although China has always been a permanent member of Security Council since 1970, for many years, China did not have much vital interest in areas beyond its immediate neighboring area unless their implications to its core tenets such as the Five Principles of Peaceful Coexistence. However, along with
China’s economic takeoff since the late 1970s, China quickly grown into a major power in the region as well as the world. Currently, it is hard to pinpoint an area in the world where China does not have significant economic, political, or military interests. Therefore, a more globalized China can consume UN PKOs’ public goods more efficiently.

Let us now turn to country-specific private interests. For all the three types of private goods discussed by Shimizu and Sandler (2002), we believe China’s economic interest is the leading factor in China’s assessment of various PKOs. While regional stability is surely a significant concern to Chinese leaders, the reality that there is almost no UN peacekeeping operation in the Asia-Pacific region, where China asserts that it has core national interests, there is no way to examine the impacts of geo-political calculation. Therefore we have the two hypotheses as follow,

**Hypothesis 3**    The more globalized China becomes, the less China’s PKO personnel contributions are expected.

**Hypothesis 4**    The more economic interests China has in a state, the less China’s PKO personnel contributions are expected to missions in the state.

While the negative relationships suggested in the above two hypotheses sound counterintuitive, but they do have a solid rationale. From an economic perspective, when China enjoys high efficiency to consume some private/public goods, a small number of peacekeepers are needed for the same amount of benefits. Furthermore, these conclusions should be understood in a relative sense: once China is more efficient to maintain its political/economic interests in a country, it will have incentives to attribute its peacekeepers to places where they are more needed.

19The only PKO in the region is about East Timor between 1999 and 2000.
Finally, the efficacy of armed forces to enhance a nation’s security \( \frac{\partial U_i}{\partial z_i} \) comes across as straightforward, which can be argued to depend on the quality and professionalism of a state’s military forces. A positive relationship indicates that higher quality of armed forces allows the Chinese government to assign more resources to PKOs without damaging its national security and interests in other places across the world:

**Hypothesis 5** The higher quality of China’s armed forces, the more China’s PKO personnel contributions are expected.

### Data and Method

**Dependent Variable**

Recall that our unit of analysis is PKO-year dyads. Therefore, the dependent variable is China’s annual PKO contribution to a particular mission. The data is from the IPI Peacekeeping Database. The original IPI data only includes monthly personnel contributions. The annual data used in the study is based on the average of all the months of a year when the data is reported. Since China did not send its first peacekeeper until the end of the Cold War, our empirical analysis actually covers all the post-Cold War period. Nevertheless, because of data availability, our empirical examination only cover the period between 1990 and 2014. For a UN PKO, a country can contribute three different types of peacekeepers: “contingent troop”, “experts on mission”, and “individual police”. The dependent variable is the sum of all three types of contributions.

In Table 2, we list all China’s PKO contributions. As we can see, since 1990, China

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\[20\text{Before October 2009, the UN had three contribution categories: “military observers”, “civilian police”, and “troops”. Since November 2009, “military observers” was replaced by “experts on mission”; “civilian police” was replaced by “formed police units” and “individual police”; “troops” now includes both traditional “troops” and “contingent troops”.

---
has dispatched 30,225 peacekeepers to 33 UN PKOs.

Independent Variables

Costs of Casualties (VSL) Since comparable national VSL data at the global level is not available Miller (2000), China’s costs of casualties are measured using its per capita GDP in (logged) 2010 constant U.S. dollars. Data is from the World Bank’s World Development Indicators (WDI).\textsuperscript{21}

Other Countries’ Contributions The contributions from other UN members are from the IPI Peacekeeping Database. For each UN PKO, the number of other countries’ contributions is calculated by subtracting China’s contributions from the total number of peacekeepers.

Globalization The political globalization index developed by ? is used to measure China’s level of globalization.\textsuperscript{22} In this data set, a country’s political globalization index is measured using "the number of foreign embassies resident in a country, the number of international organizations of which the country is a member, the number of UN peace missions in which the country has been engaged and the number of bilateral and multilateral agreements the country has concluded since 1945".\textsuperscript{23} The index runs from 0 to 100, with higher index corresponding to a higher level of political globalization.

China’s Economic Interests in the State of PKO China’s economic interests in the state where a PKO is conducted is measured by the total amount of

\textsuperscript{22}The data set is available at http://globalization.kof.ethz.ch (last accessed on March 13, 2016).
bilateral merchandise trade with China. The data is from Correlates of Wars (COW). In particular, for each country in a year, we use its share of China’s total foreign trade of the year.

**Quality of China’s Armed Forces**

We use China’s per capita military expenditure (constant 2010 US dollars) to measure the quality of its military forces, with the assumption that higher input per head will promote the quality of the military. Both the data of China’s military expenditure and population are from the World Bank’s *WDI* data set.

**Method**

Not surprisingly, there is significant variation in China’s contributions to all the UN PKOs, the annual average contributions running from as low as one to as high as 646. Because our purpose is to explain the reasons behind such variation, a statistical model with the following functional form is used:

\[ y_{it} = \alpha_i + x_{it}'\beta + \epsilon_{it} \]  

(19)

Given that we have a panel data structure, we need to control for intra-mission correlation across years. In addition, \( \alpha_i \) in the above equation controls for the individual-specific mission effects. Depending on whether \( \alpha_i \) is correlated with the independent variables, we could use either fixed or random effects estimation. The Hausman test we conducted is not significant, indicating that the random effect estimator is consistent. Hence, we report the results based on the random effect estimation with robust standard errors.
Findings and Conclusion

The outcomes of our empirical analysis are listed in Table 3. As indicated in the table, three of our hypotheses are supported by empirical evidence. First, hypothesis 1 is supported. Higher personnel costs do not deter China from sending more troops to dangerous UN PKOs. Specifically, for each percentage of increase in China’s GDP per capita, the number of soldiers it contributes increases by roughly 109. This finding confirms the effects of economic development on China’s UN PKO contributions. This finding runs directly against the outcome of systemic examination of states’ peacekeeping contributions (Bove and Elia, 2011). Our study shows China’s very high level of tolerance to cost of casualties.

Second, hypothesis 5 is strongly supported. As the quality of China’s armed forces increases, China does have more PKO contributions. In particular, for each US dollar increase in China’s military expenditure per capita, China can dispatch almost two more peacekeepers. The underlying reason for such a positive relationship is the higher quality of China free its decision makers more precious resources for UN PKOs.

Third, hypothesis 2 is rejected. Our outcomes show that China is more likely to contribute to a UN PKO when there are already high-level of committed contributions from other countries. This outcomes show the free-riding incentive is the more dominant consideration when China determines its level of personnel contribution.

Finally, there is no evidence for two hypotheses: hypothesis 3 and 4. Neither China’s level of globalization and China’s economic interests do not influence China’s PKO contributions. The lack of support of these two hypotheses suggests China is still very insensitive to the public and private benefits generated by UN PKOs. This may reflect the reality that China is still on this way to a global power. This finding also rejects the criticism that China gives priority to countries with which it has significant economic
interests. In other words, while some cases, such as the PKOs in Sudan, lend support to this argument, China also send substantial numbers of peacekeepers to states where it does not have vital economic interests.

Despite its relatively short history in UN PKO participation, China without any doubt, has already become a significant sponsor of UN PKOs. To scholars, China’s UN PKO contributions offer an invaluable opportunity to observe how a rising power can effectively translate its economic resources into global influence. While this study is not the first to examine China’s personnel UN PKO contributions, it is one of the first attempts to scrutinize this country’s UN PKO decision with some vigorous empirical models and data. Our findings reveal some interesting patterns and mechanisms of how China strives to maximize its interests with its limited resources. Some of our findings, for instance, the effect of personnel costs of UN PKOs, run directly against some conventional understanding of UN PKOs participations.

With numerous empirical examinations of UN PKO contributions being been published at the systemic level (Bellanmy, Williams and Griffin, 2010; Bove and Elia, 2011; Shimizu and Sandler, 2002), little has been done for individual states. Our study joins the effort by Ye (2017) to bridge our knowledge of the global peacekeeping endeavors and individual countries’ self-interested calculation. Our empirical model can be adjusted to examine other countries’ UN PKO contributions. It is our hope that this research can stimulate more state-based empirical analysis of UN PKOs.

References


Wu, Zhengyu and Ian Taylor. 2011. “From Refusal to Engagement: Chinese contribu-


<table>
<thead>
<tr>
<th>Mission</th>
<th>Country</th>
<th>Starting Year</th>
<th>Ending Year</th>
<th>Annual Contributions (average)</th>
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Source: IPI Peacekeeping Database.
Table 3: Estimation results

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<th>Variable</th>
<th>Coefficient (Std. Err.)</th>
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<tr>
<td>Costs of Casualties</td>
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<td>Other Countries Contributions</td>
<td>0.011** (0.003)</td>
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<td>Globalization</td>
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<td>Intercept</td>
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N: 398
Log-likelihood: .
$\chi^2_{(5)}$: 27.649

Significance levels: †: 10%  *: 5%  **: 1%