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Antecedents and Behavioural Consequences of Violence in Indonesia

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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

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Abstract

Indonesia has a long history of conflict that has often led to violence. Even today, small-scale violence persists. Existing studies on Indonesia have identified ethnic grievances, economic motives and institutional changes as some of the main drivers of conflict. While such studies are important to understand the antecedents of conflict at the macro level, there is a need to dig deeper into the consequences of conflict at the micro-level to understand its effect on individual behaviour. Thus, the objective of this thesis is first to further investigate the antecedents of violence in post-conflict Indonesia and, second, to examine the effect of the conflict experience on individual behaviour. To achieve these objectives, this study conducted a secondary data analysis at the sub-national level and a lab-in-the-field experiment in Aceh, where the last large conflict in Indonesia ended in 2005.

The sub-national analysis of secondary data uses ethnolinguistic fractionalisation weighted by linguistic similarities to objectively measure ethno-cultural diversity. The analysis finds this variable to have a curvilinear (inverted-U shape) relationship with violence—a result that is robust to different measures of violence and fractionalisation, as well as to the use of instrumental variable method and additional covariates. This finding aligns with past studies on ethnic grievances and conflict, although the relationship is non-linear, rather than linear. Most Indonesian districts have levels of diversity lower than the turning point on the inverted-U; hence, ethno-cultural diversity currently has negative effects in the country.

Experimental studies on the effect of conflict on individual behaviour have mostly focused on the prosocial. However, the research agenda is now turning to antisocial behaviour to capture the dark side of human nature. In the lab-in-the-field experiment, this study used an antisocial behaviour game to examine out-group bias between Acehnese and Javanese participants, as the Aceh conflict witnessed inter-ethnic violence between these two groups. In the game, participants could choose to pay to destroy other participants payoffs (for no reason other than spite). The study found that one in four participants destroyed in general, with the Acehnese destroying more against the Javanese. Interestingly, such antisocial behaviour was higher among women who experienced conflict, which aligns with previous studies findings that women experience the worst stress symptoms from conflict. Prior to the field research in Aceh, the same experiment was conducted

with Indonesian migrants in Melbourne, Australia, to identify the antecedents of this sort of antisocial behaviour among Indonesians who have not experienced conflict. Here, the study did not find differential behaviour against out-group members, but found antisocial behaviour to be strongly associated with negative beliefs about the other.

These findings have important policy implications, including suggesting potential avenues for improvements in conflict management by promoting intercultural dialogues. They also highlight the need to fully address the grievances of both women and ethnic minorities to ensure lasting peace.

Acknowledgements

List of Abbreviations

2SLS	Two-stage Least Squares
ANM	*Atlas Narodov Mira*
AUD	Australian Dollar
CSF	Contest Success Function
DI	*Darul Islam*
ELF	Ethnolinguistic Fractionalisation Index
G	Greenberg-Gini Index
GAM	*Gerakan Aceh Merdeka* (Free Aceh Movement)
GDP	Gross Domestic Product
HDI	Human Development Index
IDR	Indonesian Rupiah
JoD	Joy-of-destruction
MB	Money Burning [game]
NVMS	National Violence Monitoring Survey
OLS	Ordinary Least Squares
Podes	*Potensi Desa* (village census)
RA	Research Assistant
RD	Relative Deprivation
SVO	Social Value Orientation
UCDP/PRIO	Uppsala Conflict Data Program/Peace Research Institute Oslo
UK	United Kingdom
UNSFIR	United Nations Support Facility for Indonesian Recovery
USD	United States Dollar

Contents

III The Consequences of Conflict on Antisocial Behaviour 88

5 Antisocial Behaviour Experiments: A Review 89

IV   Discussion   178

8   Discussion and Policy Recommendations   179

List of Tables

List of Figures

Part I

Introduction

Chapter 1

Introduction

The first part of this thesis introduces the research background and objectives (Chapter 1) and briefly elaborates the history of conflict and violence in Indonesia to provide the overall context of the research (Chapter 2). This first chapter provides an overview of the economics of conflict and methods to achieve the thesis's research objectives. Following best practice in the field, a lab-in-the-field experiment was conducted to observe the consequences of past conflict on behaviour. Additionally, a sub-national level analysis was used to understand the antecedents of violence. Therefore, the thesis adopts two approaches simultaneously to study conflict.

1.1   The Context of Indonesia

This thesis examines the antecedents and behavioural consequences of conflict in Indonesia. The country has suffered from large-scale and significant conflict since its declaration of independence in 1945. The four-year revolutionary war against the Allied-backed Dutch only ended in 1949, after the Netherlands recognised the country. Afterwards, Indonesia experienced several insurgencies during the 1950s, an anti-communist purge during the last half of the 1960s, state terrorism throughout the Suharto era (1968 to 1998) and communal violence during the transition era (1998 to 2004). The end of the Aceh insurgency in 2005 has brought the country a period of relative peace, with frequent yet small-scale violence (Barron, Jaffrey, & Varshney, 2016).

The country's rich cultural diversity, with 964 ethnic groups and more than 700 languages spoken by 260 million people, has been exploited by elites and violence specialists to ignite ethno-communal violence (Barron, 2019; Tilly, 2003). Between 1998 and 2004, the country witnessed clashes between Muslims and Christians in Maluku, clashes between Madurese and Dayak ethnic groups in Kalimantan, and anti-Chinese violence in the country capital of Jakarta. The effect of cultural diversity on conflict could operate through the mechanism of group grievances. The government-sponsored policy of settling the Javanese—the largest ethnic group in Indonesia—into the outer islands in the late 1970s through the 1980s may have generated grudges among local ethnic groups, who felt that the migrants were robbing their natural resources. Existing conflict could also amplify underlying group grievances, as in the case of the Aceh insurgency, where inter-ethnic relations were strained by suspicions that ethnic Javanese people provided military intelligence for the national government (Schulze, 2004).

The availability of violence datasets during the past decade has resulted in a proliferation of studies seeking to understand the factors associated with violent conflict. However, most of these studies focused on incidents during the transition era, particularly ethnic conflict, and there remains the question of whether cultural diversity may have influenced violence during the post-conflict period (2005 onwards). Nevertheless, identifying the antecedents of violence is one of the many ways to understand the dynamics of conflict. Another approach is to unveil the consequences of conflict on individual behaviour, where only a handful of studies on Indonesia exist. In addition, unlike the previous approach, where researchers typically use secondary datasets on violence, behavioural research through experiments is more time and resource consuming, as the data must be elicited either in the field or in the laboratory. In particular, it remains unknown whether the last large insurgency in the country, the Aceh civil war, has had an effect on today's behaviour.

The Free Aceh Movement (*Gerakan Aceh Merdeka*, GAM) campaign started in 1976 and was led by remnants of the *Darul Islam* rebel group, who were defeated by the military a decade before. Aceh has rich natural gas deposits that caused grievances, as

the centralised model envisaged by the national government dictated that a significant portion of the resource revenue be transferred to the country capital (for redistribution to various parts of the country). Around 30,000 people were killed during the Aceh conflict (MSR, 2009). After the 2004 Boxing Day tsunami hit the region, a peace agreement was finally reached in 2005. Women were almost completely side-lined during the peace negotiation process, with no female representatives present during the early negotiations, which resulted in the complete absence of discussion on women or gender issues. Women witnessed or experienced violence, such as rape and sexual abuse, during the conflict (Amnesty International, 2004). After more than a decade of relative peace, it is unknown whether traumatic war experiences affect women differently, and if this is reflected in their behaviour.

Combining the two approaches is expected to generate substantive and important policy lessons for decision makers, based on a better understanding of the complexities of post-conflict intercommunity dynamics and behaviour. Critically testing the relationship between cultural diversity and violence will contribute to a clearer picture of how the country's rich culture may *not* necessarily lead to violence. A lab-in-the-field experiment with subjects who lived in Aceh during the conflict will provide evidence for improved policy to strengthen intercommunity relationships.

The remainder of this chapter is organised as follows. Section 1.2 provides an overview of the economics of conflict, followed by the purposes and methodology of the research in Section 1.3. Finally, Section 1.4 presents the structure of the thesis.

1.2   An Overview of the Economics of Conflict

This section provides an overview of how conflict is studied in the social sciences, and examines the approaches used by economists to study conflict. However, before elaborating on these, the first sub-section discusses the two terms of 'conflict' and 'violence' to provide a clear exposition of how they are used in this thesis.

1.2.1 Concepts

This thesis focuses on the economics of *conflict*, yet one of the analyses devotes attention to the antecedents of *violence*. Conflict, of course, does not always involve violence (such as in industrial actions or lawsuits). Consequently, the use of these terms is contingent on the context of the discussion. Broadly speaking, in the literature review (Chapter 2, 3, 5), the definition of these terms follows their original (or common) use in the literature. For example, in cross-country studies, the word 'conflict' typically refers to wars with significant number of casualties. In other cases (e.g., on economic models of conflict), the word should be interpreted more generally. When discussing conflict in Indonesia, the word usually corresponds to large, extended violence (e.g., insurgency or extended inter-ethnic violence).[1]

However, in the empirical investigations (Chapter 4, 6 and 7), some of the operational variables are derived from the original. For example, the National Violence Monitoring Survey (NVMS; data from which are used in the secondary data analysis) defines an incident as violence if it is both intentional and can be observed physically (SNPK, 2019; World Bank, 2018); however, the operational variable 'intensity of violence' is defined as the number of violent incidents per million people.[2]

In short, in this thesis, the terms are used in the way that they appeared in the original literature. It is only in the empirical investigations that some new variables (with different names) are defined, if necessary.

1.2.2 Conflict Study in the Social Sciences

Social scientists' study of conflict can be divided into several disciplines. Classical sociologists, such as Marx and Weber, theorised that class division is the source of social conflict (Weber, 2014), while modern sociological theory on conflict focuses on the role of power (Mills, 1999). Political scientists sometimes model conflict as a contest for political

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[1]Therefore, following the end of the Aceh insurgency in 2005, the years from this time onwards are often referred to as the 'post-conflict period'.

[2]Moreover, the data can be further disaggregated into different types of violence: violent conflict, violent crime, domestic violence, separatism and violence in law enforcement. The definition of the terms used from these data can be viewed on the World Bank's website (external link).
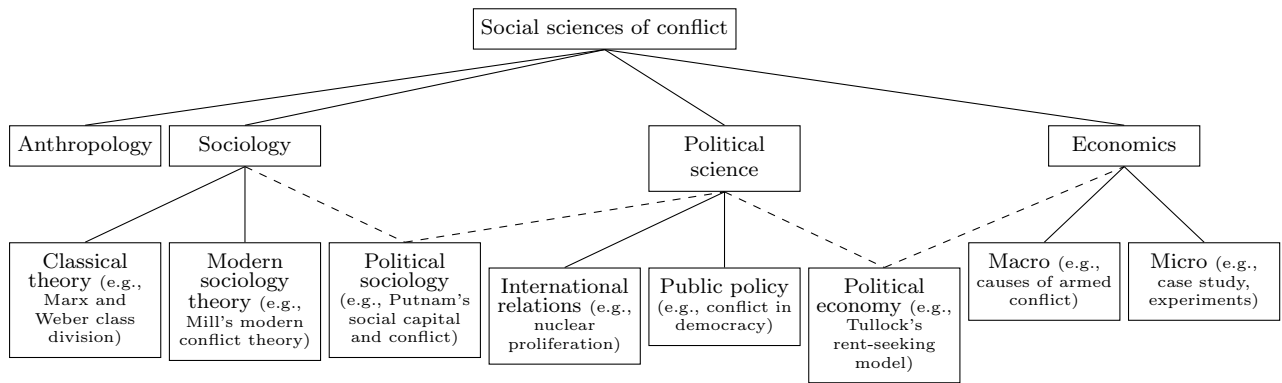
Figure 1.1: The study of conflict in the social sciences

power (Moore & Lanoue, 2003) or analyse it from various institutional lenses (Hall & Taylor, 1996). In contrast, anthropologists occasionally study peace building in post-conflict societies (Millar, 2018).

Figure 1.1 presents the study of conflict in the social sciences.[3] In practice, some social scientists conduct their research using methods from different disciplines; therefore, the branches should not be seen as independent from each other (this is shown by the dashed lines in the figure). For example, economic sociologists place weight on the role of social networks in economic outcomes (Granovetter, 1976). Meanwhile, in political sociology, researchers study how the various components of a society—such as religion and ethnicity—can bring about social capital, which may influence political struggles (Coleman, 1990; Colletta & Cullen, 2000).

In economics, conflict is often viewed as the result of rational decision making of agents trying to maximise their payoffs (Garfinkel & Skaperdas, 2007; Hirshleifer, 2001; Wärneryd, 2014). Some economists use contest games—where agents compete (spend resources on arming) to increase the probability of winning a conflict (for a review, see Garfinkel & Skaperdas, 2007; Konrad, 2009)—and experiments are often conducted to test theoretical predictions (Abbink, Brandts, Herrmann, & Orzen, 2010; Durham, Hirshleifer, & Smith, 1998). However, the assumption of rational choice is criticised for

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[3]This is by no means complete. The branches are only meant to provide examples, rather than an exhaustive list of disciplines/sub-disciplines. Also, psychology was excluded intentionally from the figure, as it has been argued to underpin the behaviour of agents studied by these three branches of social science. For example, political psychology is used to study the behaviour of conflict perpetrators and the judicial system, while economic psychology (behavioural economics) can be used to study the effect of violent conflict on preferences and the limit of human cognitive process (bounded rationality).

reducing conflict to a simple market (bargaining) problem, which ignores the construction of grievances (Keen, 2000; Vahabi, 2009). In addition, different social norms and institutions shape human interactions differently, including the use of violent means to enforce norms (North, Wallis, & Weingast, 2009).

Empirical approaches to studying conflict in economics can be divided into macro and micro studies (Figure 1.2). Macro studies are typically used to identify the common factors associated with conflict and are usually conducted using country- or cross-country-level data. This approach is appealing because of the widely available conflict datasets, such as the armed conflict data hosted by the Uppsala Conflict Data Program/Peace Research Institute Oslo (UCDP/PRIO) and the Global Terrorism Database. However, this approach has been criticised as lacking explanations of the mechanisms that drive the results and as being prone to endogeneity problems (where the factors that contribute to conflict are determined by the variables omitted from the equation) (Blattman & Miguel, 2010).

The second analytical approach to conflict economics—micro studies—is generally used to understand individuals or groups in conflict situations. It can also be in the form of a case study of organisations or events (e.g., Abadie & Gardeazabal, 2003). Analysis at individual or group level can occur through behavioural research (e.g., experiments) or non-behavioural study (e.g., crime economics). Further, the behavioural study of conflict can be categorised into two major types: 'macro' and 'micro' (see the bottom two boxes in Figure 1.2). In 'macro' behavioural studies, researchers are interested with coordination and collective action problems that focus on *mass* social phenomenon, such as riots (Abbink & Doğan, 2018), power struggles (Durham et al., 1998) or anarchy (Powell & Wilson, 2008; A. C. Smith, Skarbek, & Wilson, 2011). Such studies are similar in spirit with (Schelling, 1978) 'macrobehaviour', where individuals' actions shape the social (group) aggregate. In contrast, 'micro' behavioural studies focus on observing behaviour at individual, rather than aggregated, levels. For example, in antisocial behaviour experiments, individual participants engage in a game where they have the opportunity to destroy each other's money (Abbink & Sadrieh, 2009; Zizzo & Oswald, 2001).
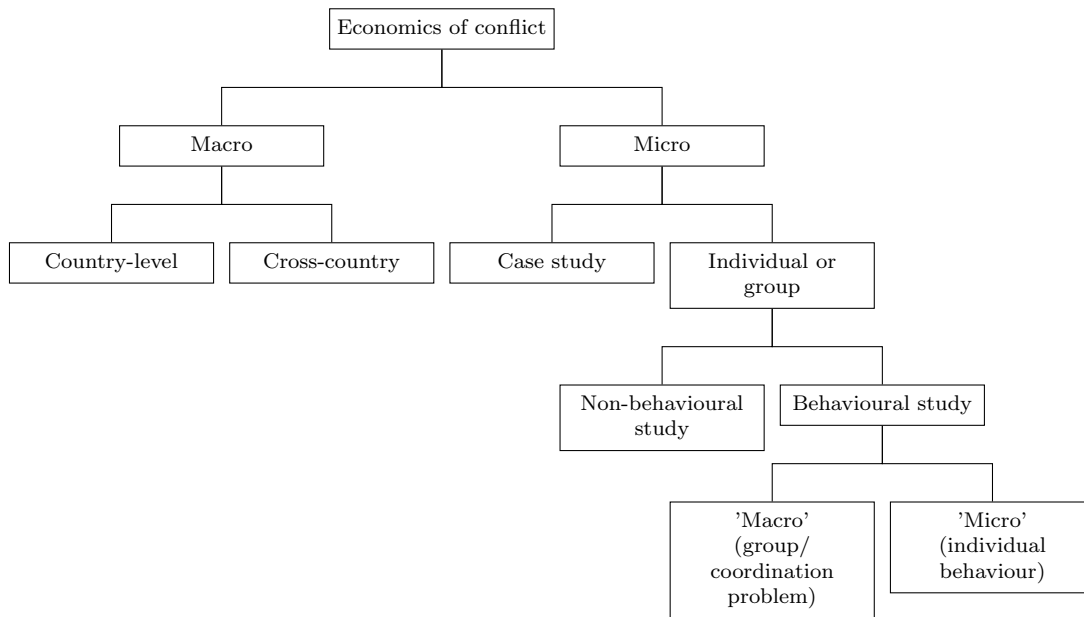
Figure 1.2: Economics study of conflict

Behavioural research through experiments has relatively strong internal validity in establishing the causal mechanism, as the researcher can change elements of the environment and follow strict protocols that ensure the experiment's replicability. Further, they can be used to test theoretical models and complement field data (Abbink, 2012). More importantly, laboratory procedures can also be brought to the field, where participants are taken from the general population. Such experiments are useful when researchers wish to observe behaviour that is affected by the surrounding socioeconomic environment and institutions (Charness, Gneezy, & Kuhn, 2013; Harrison & List, 2004).

Overall, the economic study of conflict has unveiled several important findings that can be broken down into two streams of research: the antecedents and consequences of conflict. As noted previously, empirical investigations that seek to link conflict with its drivers are usually plagued by endogeneity problems, which renders it difficult to establish a strong case for causal identification. Therefore, those drivers should be seen as *antecedents* (or correlates), rather than causes of conflict. Conflict also have behavioural or non-behavioural consequences, where experiments are often used to investigate the former.

Regarding the antecedents of conflict, economists and other social scientists typically found greed, unaddressed grievance and institutions as factors that drive conflict in most

cross-country studies. Yet the question remains how they are related to within-country conflict and violence. Specifically, there is a demand for a deeper understanding of the role of grievances and institutions at country level.

Regarding the behavioural consequences of conflict, Bauer et al. (2016) proposed several theoretical explanations in the context of prosocial behaviour after civil wars, yet it remains unclear whether they are relevant in explaining antisocial behaviour, such as spite. Antisocial behaviour experiments could serve as a point of departure for research in post-conflict regions, as they capture negative behaviour that erodes community cohesion and is inherent in real conflict. In addition, most post-war experiments have been limited to within-community interactions, which does not say much about intercommunity relationships.

1.3 Research Objectives and Methodology

1.3.1 Research Objectives

The previous section has presented an overview of the economics of conflict literature and a number of research opportunities. Regarding conflict antecedents, a deeper understanding (and with better identification) at the country level is needed to enable improved policy. This is relevant for Indonesia, as the country's rich cultural diversity is often exploited to ignite violence, yet existing studies have not critically addressed its potentially endogenous problem. Regarding the consequences of conflict, knowledge of the long-term effects of war on antisocial behaviour would contribute to the ongoing discourse in the post-conflict literature. It is also relevant to Indonesia, as the last civil war (the Aceh conflict) marred intercommunity relationships, and it remains unknown whether the conflict has had consequences for individual behaviour.

Therefore, this study aimed to investigate the antecedents of violence and the consequences of conflict experience on antisocial behaviour. Specifically, it used two approaches to achieve these aims. First, it sought to identify common factors that contribute to violence at sub-national level in post-conflict Indonesia. Second, it examined the conse-

quences of the Aceh conflict on behaviour using a lab-in-the-field antisocial experiment. Together, the thesis provides an extensive economics study of conflict that sheds light on the current dynamics of intercommunity relationships and behaviour.

1.3.2 Methodology

This thesis employed two approaches (secondary data analysis and lab-in-the-field experiment) to attain the two research objectives. Analyses of secondary data was used to answer the first objective (antecedents of violence), while data from the lab-in-the-field experiment were used to answer the second objective (consequences of conflict). The following provides an overview of these two approaches.

An analysis of violence using secondary data at sub-national (district) level was conducted by focusing on the role of cultural diversity, while also controlling for economic and institutional factors. In the empirical model, a combination of violence and other supporting data was used in the regressions. Focus was given to the construction of cultural diversity and tackling the potentially endogenous problem. In addition, the model was further scrutinised by adding more controls, using alternative measures of violence and using different econometric specifications.

While secondary data analysis is important for identifying the antecedents of violence, it can be argued that violent conflict affects people and, therefore, having an understanding of its consequences on behaviour is equally, if not more, important. Therefore, a lab-in-the-field experiment was used to elicit antisocial behaviour using a modified version of the joy-of-destruction (JoD) minigame (Abbink & Herrmann, 2011; Abbink & Sadrieh, 2009). Participants' behaviour was elicited using the strategy method, in which they were asked to make decisions about different types of co-participants based on their ethnicity and gender.

Good conduct of an experiment should generate meaningful data to establish the causal direction. However, regularities in an experiment do not necessarily translate to external validity, and more sessions with a larger sample size are often demanded. Moreover, when an experiment is conducted in the field instead of the laboratory, the

researcher can lose some control over the environment. Therefore, pilot sessions were conducted to identify potential problems during implementation.

1.4 The Structure of the Thesis

This thesis is divided into four parts. Part I introduces readers to the thesis and the overall context. After this first chapter, Chapter 2 explores Indonesia's history of conflict and violence. While this chapter mostly consists of historical accounts of conflict, it also encapsulates the general findings from qualitative studies (mostly outside economics) used to inform the empirical model and interpret the results.

Part II reviews the literature on the antecedents of conflict and the empirical findings on Indonesia. Chapter 3 provides an extensive list of economics of conflict literature, both cross-country and in Indonesia. The chapter not only complements the previous historical chapter (in informing the empirical investigation), but also provides the necessary theoretical foundation. Chapter 4 examines the factors associated with violence using regression analysis. It also critically examines the cultural diversity variable—how it is measured and how to tackle endogeneity—and tests the prediction of a theoretical model of conflict.

Part III elaborates the literature review on antisocial behaviour and the experimental results. Specifically, Chapter 5 reviews the literature in the following ways: how antisocial behaviour (spite) is theorised, how to elicit the behaviour in experiments, what are the general results, and what are the antecedents of such behaviour. Next, the two empirical chapters provide the behavioural evidence from participants who live in conflict and non-conflict regions. The first experiment (Chapter 6—Melbourne) is a precursor to the second (Chapter 7—Aceh), where the original design of the experiment was tested with participants who were much less likely to encounter conflict. Besides some practical knowledge on ways to improve the experiment's implementation in Aceh, the first experiment also identified the factors associated with antisocial behaviour. In contrast, participants in the Aceh experiment were much more likely to be directly affected by conflict. The Aceh study provided evidence on the lingering effects of conflict on antisocial

behaviour. It also highlighted the current state of intercommunity relationships in the region.

Finally, Part IV (Chapter 8) summarises the thesis. The chapter discusses the study's main findings, contributions to the literature, policy lessons, limitations and directions for future research.

Chapter 2

The History of Conflict in Indonesia

This chapter discusses the history of conflict in Indonesia to provide the context for this thesis. Historical accounts indicate numerous large-scale conflicts and violence since the pre-colonial period. However, systematic efforts in surveying conflict and violent incidents have only been made since early 2000, which sparked a number of quantitative studies at the sub-national level. These studies are discussed in greater detail in Chapter 3, Section 3.4, since this chapter focuses on the descriptive and qualitative aspect of the country's conflict history. Together with Chapter 3, the findings from this chapter lead to identification of the roots of violence—economic opportunities, ethnic/group grievances and institutions—which are used as controls in the empirical investigation in Chapter 4. Finally, this chapter provides an overview of the Aceh conflict—the largest insurgency of the last 50 years—which serves as the background for the experiment in Aceh (Chapter 7).

2.1 Introduction

This chapter focuses on the events following Indonesia's proclamation of independence in 1945, where the country underwent several phases—from the Sukarno era to the *Reformasi* era—in which different types of conflict emerged. Before independence, the history of violence in what is now known as Indonesia can be traced back to the pre-colonial period (before the 17th century). During this era, labour served as an important factor of

production, and wars were sometimes aimed at moving people from the conquered to the victor's region (Ricklefs, 2001). The country was under colonial occupations and the effect of these occupations was devastating for the local population. For example, the Dutch colonial army killed around 125,000 people between 1871 and 1910, with more than half of the casualties being Acehnese people (Nordholt, 2002).[1] In addition, in Java, the increasingly stratified social order within the indigenous population created inequality and poverty, which caused violent resistance from the population in late 19th century (Ricklefs, 2001).

This chapter aims to provide the context of the thesis, as well as identifying the factors associated with conflict and violence in modern (post-independence) Indonesia by reviewing a number of qualitative studies. The selection of the literature does not follow a strict rule, but emphasis is given to those studies that considered events from the past 50 years, from Suharto's era (1966 to 1998) to the *Reformasi* (1999 to today), as it is often argued that remnants of Suharto's authoritarian rule are still affecting the current socio-political environment (see, e.g., Hadiz & Robison, 2013). To provide a coherent narrative and consistent timeline, the sections are presented in chronological order and relevant studies are used to explain the occurrence of conflict or violence in each period.

The remainder of this chapter is organised as follows. Section 2.2 examines the Sukarno era, where conflicts were mostly in the form of major internal conflicts. Section 2.3 summarises events during Suharto's era, where a number of violent incidents were perpetrated by the state. Secessionist movements emerged, including the Aceh conflict, during this era. Sections 2.4 and 2.5 divulge events during the *Reformasi* era, with the former focusing on large ethno-communal violence during the early years of *Reformasi* (the transition era), and the latter concentrating on small-scale violence during the more recent years (the post-conflict period). Finally, Section 2.6 discusses the common themes found from the history of violence in Indonesia, as well as the way forward.

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[1]The colonialism also resulted in a number of rebellions by local kingdoms, such as in Makassar (1666 to 1669), Maluku (1817), Java (1825 to 1830), Bali (1846 to 1849), Kalimantan (1859 to 1863) and Aceh (1873 to 1904).

2.2 The Sukarno Era

Under Sukarno's leadership, the newly born nation embarked into a turbulent revolutionary war against the Allied-backed Dutch, which ended in 1949 after the latter acknowledged Indonesia's sovereignty. The war resulted in the death of between 45,000 and 100,000 people from the Indonesian army (Vickers, 2005).[2] After the revolutionary war, the history of violence during the leadership of Sukarno was related with political struggles, as the country was in search of the 'right' system of government. During these times, the parliamentary democracy was in place which created frequent turnovers in government's cabinets.

The first serious internal conflict occurred when the People's Democratic Front, which comprised left-wing parties, took control of Madiun City in East Java on 18 September 1948. This was followed by at least four major internal conflicts during the parliamentary democracy era (1950 to 1968), as summarised in Table 2.1.

The *Darul Islam* (DI) movement was the longest and most widespread rebellion in the history of Indonesia; with geographical coverage from West Java, Central Java, Kalimantan, South Sulawesi and Aceh and took more than 40,000 lives (Vickers, 2005). The movement also became the seed of the Free Aceh Movements (*Gerakan Aceh Merdeka*, GAM) in the mid-1970s. While the aspiration to have an Islamic state was one of the objectives of DI, three other factors contributed to the struggle (van Dijk, 1981): (i) the demobilisation of guerrilla groups following the proclamation of independence; (ii) centralised control in economic and governance, and (iii) class struggle as a result of changes in the agrarian structure.

The Republic of South Maluku was an interesting offshoot of Indonesia's political experiments as the movement was driven by former Dutch soldiers that were native of Maluku islands in the eastern part of modern-day Indonesia. The combination of their distrust with the muslim-majority Indonesian government and their loyalty to the Dutch had led to the uprising which peaked in September to November 1950 where the Indonesian army invade the islands. The fighting was mostly ended by the end of 1950 and the

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[2]The number of civilian casualties ranged from 25,000 to 100,000.

Table 2.1: Major internal conflicts, 1945 to 1968

	Location	Period	Casualties
Madiun Affairs	East Java	1948	8,000
Republic of South Maluku	Maluku	1950 to 1963	Up to 5,000 died
Islamic State (*Darul Islam*/DI)	West Java, South Kalimantan, South Sulawesi, Aceh	1948 to 1962	
The Charter of the Common Struggle	North Sulawesi	1957 to 1961	$\Big\}Up to 40,000 died$
The Revolutionary Government of the Republic of Indonesia	Sumatra	1958 to 1961	

Source: UCDP/PRIO database, Ricklefs (2001) and Vickers (2005).

Netherlands did not want to pursue the issue further.

The Charter of the Common Struggle in North Sulawesi and The Revolutionary Government of the Republic of Indonesia in Sumatra were separate insurgencies but tied with the same dissatisfactions against the central government. There were clandestine supports for the movements from the United States of America as the latter was worried that the Sukarno's government was leaning towards the eastern bloc. However, Sukarno determined to crushed the movements and by the end of 1958 the rebellions were lost. In the aftermath, Sukarno had effectively led the Soviet Union to have an increasing influence in Indonesia's domestic affairs.

As a response to the 'free democracy' which led to a number of insurgencies, Sukarno proposed the 'Nasakom' (an acronym for nationalism, religion [*agama*] and communism) political system in 1957. The new system was greeted with violence between the different groups, most prominently between the communists and the Islamic groups. Political conflicts also spread outside Indonesia, with the country provoking a confrontation with Malaysia and Singapore between 1963 and 1966.[3]

The end of the Sukarno era was marked by the event on 30 September 1965, where six army generals were assassinated, followed by the takeover of Jakarta, allegedly conducted by army troops infiltrated by communist elements. However, it is possible that the communists were not the only masterminds of the event (Ricklefs, 2001). The takeover

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[3]The confrontation was not held in full force, and, combined, the number of casualties was fewer than 1,000 people from both sides (Carver, 1986). One possible explanation for the lack of military interest was the disagreement among Indonesian military generals, as some saw a much greater threat from the Indonesian communist party (Vickers, 2005).

was short-lived and Suharto, the commander of the Army's Strategic Reserve, managed to control the situation. Sukarno's public role was greatly diminished following the event and, in 1966, he signed a letter of transfer of authority to Suharto. A year later, Sukarno was impeached by the legislative body, and the transition to the 'New Order' was completed when Suharto took his first presidential oath in 1968.

2.3 The New Order

Suharto's New Order era was characterised by economic and political stability. The economy grew at around seven per cent annually from 1968 to 1996, while income inequality was at relatively low levels, with Gini coefficients hovering around 0.33 between 1976 and 1998. The political system was also manipulated so that only *Golongan Karya*, the government-owned political body, could win the elections (Ricklefs, 2001). Nevertheless, the country experienced a number of violent conflicts that can be categorised into state terrorism and separatist movements. The following sub-sections examine these types of conflict separately.

2.3.1 State Terrorism

Suharto's 32 years of authoritarian rule were marked by a number of violent events perpetrated by the state (state terrorism). The occurrence of such violence found its justification in the 1965 to 1966 anti-communist purge, which strengthened Suharto's grip over the nation (Heryanto, 2006). The purge was the worst violence experienced by modern Indonesia, with the number of victims greater than that during the pre-independence period combined (A. W. Adam, 2008). There is still no formal report on the number of people killed, but the generally accepted figure is somewhere between 500,000 and one million people (Cribb, 2001). Civilians, supported by the military, were actively engaged in the killings, including those organised through religious organisations (Wertheim, 1966).[4] Also, some Chinese Indonesians were killed during the purge, mostly because of

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[4]In Bali, the killings were supported by the youth wing of the nationalist party and fuelled by the communist party's rejections of Bali's traditional system. It was estimated that the proportion of people

their association with the communist and not because of their ethnicity (Cribb & Coppel, 2009).

State-sponsored terrorism in Indonesia encompassed a wide variety of incidents, from extrajudicial killings to unlawful arrests. State terrorism was institutionalised through the Law No. 11/PNPS/1963 on Subversion, and mostly targeted suspected communists. However, these people were not the only victims of the violence (see Table 2.2).

Military elites and the associated paramilitary groups played important roles in the state terrorism (Collins, 2002). Despite some military reforms following the fall of Suharto, those elites were never held accountable for their alleged crimes. In fact, they reorganised themselves into new political power (Hadiz & Robison, 2013), such as the current defence minister, Prabowo Subianto, who was suspected of kidnapping activists in 1998. A 'culture of violence' is often used as a justification for the military's use of violence.

Table 2.2: Examples of state terrorism during the New Order

	Period	Victims	Casualties	Modus operandi
'Petrus' (mysterious shooter)	1983 to 1985	Suspected thugs and criminals	>5,000 died	Extrajudicial killing by the military; dead bodies placed in public areas.
Tanjung Priok massacre	1984	Muslim protesters	24 died, 55 injured	Open fire towards protesters; imprisonment without warrants.
Talangsari incident	1989	Islamist group	45 died, 5 kidnapped, 88 forced disappearance, 36 tortured	Military attacked the village hiding the group.
Activists kidnappings	1996 to 1998	Activists	One died, 13 missing	Unlawful arrests, killing and kidnappings of activists suspected as being communists.

Source: Bourchier (1990), Komnas HAM (2000, 2016) and Kontras (2008, 2017).

During a 2001 event, Prabowo Subianto claimed that:

Indonesian culture is very violent and the military is a mirror of society ... this whole culture in Indonesia is a culture of violence between tribes and ethnic groups. Indonesians can very quickly turn to violence ... The word 'amok' comes from the *lingua franca* of this archipelago. (Collins, 2002, p. 582).

killed in Bali was higher than that in other provinces in Indonesia.

Although such a deterministic view of culture is generally rejected by most scholars (e.g., Collins, 2002), the concept of violence as a sub-culture is more accepted, as most scholars agree that culture is malleable and not rigid (Cribb, 2002).[5] In addition, violent sub-cultures are often present in local gangsters or thugs, which overlap with paramilitary groups associated with political or youth organisations.

2.3.2 Separatist Movements

This sub-section explores three ethnonationalist separatist movements in Aceh, East Timor and Papua, where three common themes emerge from the literature. First, there is an argument that Suharto's vision of the 'national model' contributed to unresolved violence in these regions. The model 'focused on unity through the formation of homogeneous political, social, developmental, and even some cultural characteristics for all of Indonesia's diverse ethnic groups' (Bertrand, 2003, p. 28).[6] A narrow view of 'unity' translated into military operations in Papua and Aceh, where the two separatist movements were and still are judged to be incompatible with the model and, therefore, need to be eliminated through any means possible.

Second, it has been argued that factions within the military during Suharto's era contributed much to the occurrence of violence, not only the killings in East Timor, but also the anti-communist purge and state terrorism:

> The most definitive finding ... is that the main sponsors of mass political violence in the country during the past four decades have been elite factions connected to the state and the army. (Zinoman & Peluso, 2002, p. 546).

Such factions were allowed to occur because of Suharto's *dwifungsi ABRI* (security force's dual function). In this doctrine, the security force, which consisted of the military and police, actively participated in a public role, affecting economic and sociocultural policies. Many of the elites benefited from these arrangements; however, because they

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[5]Also, as will be seen in Chapter 3, economists have tried to incorporate the malleability of ethnic identities in an economic model that attempts to explain exploitation by a dominant group.

[6]One of the slogans for this model is *NKRI harga mati* ('the Unitary State of the Republic of Indonesia is undisputed'), which is still a popular phrase among military officers, politicians and supporters of nationalist movements.

were often used by Suharto as a tool for personal purposes, they were eventually divided along controversial issues, such as religion (Honna, 2003).

Third, economic grievances also drove the conflict, as evident in the case of Aceh and Papua, where the insurgents demanded more equitable revenue sharing, among other things. The revenue boom following the 1970s oil price shock was redistributed to other regions and, while this helped reduce regional disparity, it nonetheless created grievances in Aceh and other resource-rich regions, including Papua. The regional economic convergence (and the grievance that followed) is argued to have led to secessionist movements, as the redistribution process was centralised and viewed as unfair (Tadjoeddin, 2010, 2011). The following segments discuss the conflict in Aceh, East Timor and Papua.

The Aceh Conflict

GAM started its campaign in 1976—the same year Indonesia occupied East Timor—and only ended in 2005, seven years after Suharto's downfall. Many of GAM's commanders and sympathisers were ex-DI rebels, who were quashed by the government's force in 1962. In the 1980s, GAM's military strength was still relatively small, but the Indonesian government responded heavily by designating the area as being under a military emergency from 1989 to 1998.

The Aceh conflict involved ethnic issues and economic grievances (Aspinall, 2007). Following the DI rebellion in the 1950s, the region was declared a 'Special Region', which strengthened the Acehnese identity and was followed by a sense of entitlement. Together with the increased authoritarian rule of Suharto and the 1970s resources boom, where Aceh was one of the main producers of natural gas, the feeling of entitlement gave birth to the GAM, which portrayed Acehnese as victims of the national government. Further, the presence of a foreign oil and gas company in Aceh was not only seen as a manifestation of resource theft, but also as the entry point for goods and activities deemed immoral—such as alcohol, gambling and prostitution—in the deeply religious region (Ricklefs, 2001).

Although GAM's combatants were mainly men, there were also women who actively participated in the insurgency. *Inong bale* ('widow') was a group of female combatants

with membership in the thousands. These women joined the insurgency because they had witnessed or experienced violence against themselves or their families (Schulze, 2004). In addition, similar to wars in other countries, women participated in the labour force and took over the social roles of men in their communities during the long course of the insurgency.

The targeting of ethnic Javanese was an unpopular and controversial aspect of the Aceh civil war. GAM perceived the central government, and especially ethnic Javanese, to be the usurpers of Aceh's resource. With 40 per cent of the population, the Javanese are the dominant ethnic group in Indonesia, yet a minority in Aceh. The persecution of ethnic Javanese was also grounded in the fear that they would assist the military in providing intelligence.[7] There is evidence that GAM's intimidation of ethnic Javanese led to ethnic tension and outmigration.[8] The outmigration was even more pronounced when the region was placed under the 1989 to 1998 military operation and during the 2003 offensive military operations (Amnesty International, 2004; Czaika & Kis-Katos, 2009; Schulze, 2004; C. Smith, 2015).

After more than two decades of war and the demise of Suharto in 1998, Law No. 25/1999 on Fiscal Balance was introduced to tackle the economic grievances of Aceh and other natural resource-producing regions.[9] However, the law was still amended once again through Law No. 18/2001. Nevertheless, the Acehnese viewed the new law with scepticism, and it did not help much with the peace negotiation.

The peak of the conflict occurred a couple of years after the New Order collapsed through the launch of offensive military operations in 2003, where around 15,000 people

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[7]This seems to fit with the theory of statistical discrimination, where rational, non-prejudiced people discriminate against other people with certain demographic characteristics (Altonji & Pierret, 2001; Dahlby, 1983). Also, it should be noted that, despite very few in numbers, there is evidence that some insurgents were ethnic Javanese (Aspinall, 2009).

[8]Note also that inter-ethnic tensions were not exclusively against Javanese. Indigenous ethnic minorities, who mostly live in central highland districts, were generally against the insurgency (Barter, 2015). In fact, they formed the *Aceh Leuser Antara* around the year 2000, with the aim of forming a new province. In addition, the outmigration had a direct effect on the region's cultural diversity: Aceh ranked in the bottom quartile of the Greenberg-Gini index (which measures diversity) in 2010—a 29 percentage point drop compared with the value of the index in 1990.

[9]The law stipulated that the regional government would only keep 30 per cent of natural gas revenue (minus tax); the share was even lower (15 per cent) for oil revenue. This was hardly fair for Aceh, where 98 per cent of the region's exports value was from liquefied natural gas and condensate in the 2000s.

were killed on both sides. However, in 2004, the largest earthquake ever recorded in Indonesian history hit the western coast of Sumatra, and the subsequent tsunami killed around 160,000 people, mostly in Aceh. The tragedy, alongside other factors, placed tremendous pressure on both sides, and a peace agreement was signed in 2005.[10]

The insurgency displaced more than half a million people during the intense period between 1999 and 2004, and took around 30,000 lives between 1976 and 2005 (MSR, 2009). There are also many accounts of gendered violence in Aceh. For example, Indonesian security forces were accused of torture, rape and public stripping of women, including underage girls. Such incidents were repeated in patterns that indicate the systemic use of violence against women as a war tactic. Women in Aceh also suffered from having their family members killed, and an estimate by the Indonesian human rights committee suggests that 3,000 women were widowed from 1989 to 1998. The Indonesian military responded by holding military tribunals that tried hundreds of soldiers in more than 500 cases, from the beginning of the 2003 Offensive Military Operation (Amnesty International, 2004, 2013).

The conflict affected the economy, with the financial loss corresponding to Indonesian Rupiah (IDR) 107.4 trillion (equivalent to United States Dollar [USD] 10.7 billion at that time) or 7.4 per cent of provincial gross domestic product (GDP) from 1999 to 2004. The national government also bore a financial burden, mainly from expenditure for military campaigns. Inflation in Aceh was always higher than average in Indonesia during the height of the conflict (2000 to 2004), except in 2003, when a cease-fire lasted for several months.[11] Local governments were barely functioning during the last phase of the conflict, as only one-sixth of the provincial budget was spent in 2001, which rendered public service delivery ineffective.

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[10]Other factors contributing to the successful peace negotiation included the active roles of political leaders, pressure from international communities and weakened military powers (Harris, 2010; Schulze, 2007; Tunçer-Kılavuz, 2017).

[11]Aceh's inflation in 2000 was almost twice that of Indonesia's. This trend faded after 2005 and, from 2010 onwards, the rate of inflation in the province has been consistently lower than that of Indonesia.

East Timor and Papua

The country also dealt with separatist movements in East Timor and Papua, where their problematic integration with Indonesia fuelled the conflict. East Timor was annexed in 1976 after the former Portuguese colony declared its independence one year earlier. Papua only became part of Indonesia in 1969 after the Act of Free Choice, which was criticised for failing to fairly represent the voice of Papuans.[12] A report from the Commission for Reception, Truth and Reconciliation in East Timor estimated that close to 20,000 people disappeared or were violently killed during the occupation. However, an estimate by UCDP/PRIO suggests that the number was much higher, with up to 101,250 deaths. Meanwhile, UCDP/PRIO estimates that up to 18,500 battle-related deaths occurred in Papua from 1965 to 1978 (Lacina, 2009; Lacina & Gleditsch, 2005).

The two movements had different fates. The 1999 referendum guaranteed East Timorese a future as a state, as 78.5 per cent of people voted for independence, whereas the conflict in Papua continues today. The ongoing conflict in Papua is partly because of the region's mountainous and rough terrains, which render military operations ineffective. In addition, rapid modernisation and significant changes in demographic composition are important factors that have prolonged the conflict in Papua (McGibbon, 2004). Papua's vast natural resources have brought government-sponsored development projects aimed at modernising the region, followed by the incoming of migrants to meet the demand for skilled labour. However, the local population viewed the projects as meagre compensation for the resource extraction, and the entry of migrants created ethnic divisions, worsened by competition for land and resources. In East Timor, these factors were non-existent, as the region was not resource rich and was not a major transmigration site.

2.4 The Transition Era

The previous section examined events during Suharto's era. The dethroning of Suharto marked the beginning of the *Reformasi* era, which continues today. The pattern of vi-

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[12]The Free Papua Movement began in 1965, one year before Sukarno handed his power to Suharto.

olence during *Reformasi* is best observed by splitting the period into the transition era (1998 to 2004; this section) and the contemporary or post-conflict Indonesia (2005 to today; next section), as the two periods have different characteristics, with the former associated with large communal violence, whereas violent incidents during the latter period have been relatively small yet frequent.[13]

The country suffered from significant ethno-communal violence during the transition era, including anti-Chinese violence in Jakarta and Muslim-Christian violence in Maluku. The former occurred in May 1998 and, in Jakarta only, claimed the lives of 1,188 people and damaged 1,026 houses.[14] The latter occurred in practically all districts in Maluku from January 1999 to June 2000. The large number of casualties (more than 5,000 people killed) makes it the worst of all ethno-communal violence incidents. The United Nations Support Facility for Indonesian Recovery (UNSFIR) data estimates the number of ethno-communal violence events during the transition era jumped to 546 from just 57 during the 1990 to 1998 period.[15] The number of collective violence events—incidents with at least 10 perpetrators—was also higher during the five years of the transition era than during the last 18 years of the New Order.

Ethno-communal violence also emerged between local indigenous people and transmigrants, some of which was episodic. Between December 1996 and January 1997, conflict between the indigenous Dayak communities against the Madurese transmigrants in Kalimantan resulted in 600 deaths (Human Rights Watch, 2001). The violence re-emerged in 2001, with hundreds of casualties. Similar events occurred in Sumbawa, with the 1980 riots between Balinese transmigrants and the local communities resurfacing again in 2013. The transmigration program is another example of the implementation of the aforementioned 'national model' that is considered as one of the causes of violence. It was the largest resettlement scheme in the world, driven by the national government's efforts to unite the country's diverse ethnic groups and to relieve population pressure from Java to

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[13]The year 2004/2005 was chosen as the cut-off period between the two eras, as it coincides with the peace agreement between the Free Aceh Movement and the Government of Indonesia and the introduction of the first direct presidential election.

[14]It should be noted that the anti-Chinese violence also occurred in other parts of Indonesia, such as in the city of Medan in Sumatra and Surakarta in Central Java.

[15]Note that the data only record group violence and do not count general crimes, terrorism or homicides.

the outer islands.[16] The program had been conducted since 1905, yet gained momentum when, between 1969 and 1989, 919,000 families were permanently resettled. It was also partially funded by loans from the World Bank, totalling USD 820 million for projects approved from 1976 to 1992 (Fearnside, 1997). In addition to the government-sponsored migration, the number of voluntary or spontaneous migrants were also large and they were part of the estimated five million transmigrants relocated during the Suharto's era.

Tadjoeddin (2010) argued that population migration, mostly from Java to outer islands, contributed to the convergence across ethnic groups, which led to conflict. Ethnic grievances surfaced as the arrival of migrants generated grudges among local groups, who felt that they were either being cheated (for having their economic resources taken away) or looked down on (as the migrants tended to be more successful in trade). These grudges could lead to violent conflict if supported by elites and weakened central authority, as was the case during the transition era. Nevertheless, other studies have presented more nuanced views on the transmigration program. For example, it was often spontaneous, rather than the government-led transmigrants that were involved in some inter-ethnic violent incidents. In addition, there were peaceful relationships between Javanese transmigrants and their local counterparts, even during the conflict (Barter & Côté, 2015). For example, during the Madurese-Dayak and Maluku conflict, Javanese transmigrants were spared.

Finally, there is also an indication that events following the anti-communist purge had a long-term effect on conflict during the transition era (Farid, 2005). For example, the curtailment of labour unions and direct appropriation of wealth were considered part of Suharto's economic strategy to provide productive assets to military-backed business-people. Consequently, the absence of rule of law during the transition era was claimed to have instigated land and other conflict in some of these locations.

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[16]There was also local transmigration, where people were reallocated to other areas within the same province or district. This was usually conducted to move people from areas designated for development projects, such as dams or plantations.

2.5   Post-conflict Period

This section examines the characteristics of violence in the years following the end of the Aceh insurgency. Unlike during the transition era, which was associated with large incidents of ethno-communal violence, this period was characterised by low-intensity, high-frequency violent incidents, as shown in Figure 2.1. According to data from the NVMS, the number of people killed between 2005 and 2014 (21,166) was roughly the same as that in the shorter period of 1998 and 2004 (21,274). While the number of casualties diminished, the frequency of smaller incidents increased significantly. In addition, separatist violence was greatly diminished following the Aceh peace agreement, and the Papua insurgency is the only threat faced by the government today. See also Figures B.3 to B.9 in Appendix B for the distribution of intensity of violence by region in 2005 and 2014.

Violence sometimes re-emerges in post-conflict regions. For example, on August 2019, a number of large cities in Papua experienced turmoil in which riots—allegedly prompted by racist comments against Papuans—killed at least 23 people and caused a massive flight of the population (BBC, 2019; Detik, 2019).[17] Prior to this event, a number of ethno-communal violent incidents erupted, particularly between the local population and migrants from the Buginese ethnic group (Barter & Côté, 2015).

Inequality is also a major factor that has been argued to ignite violence. The literature generally divides inequality into two types: vertical and horizontal. The former is typically measured using the Gini coefficient of income inequality, whereas the latter is sometimes calculated by comparing group (e.g., ethnic) differences in income. Its historical traces can be found even during the colonial era, as briefly mentioned in the introduction.

The country witnessed relative stability, both politically and economically, during the 30 years of the New Order, which arguably mitigated the risk of conflict. However, during the *Reformasi* era, Indonesia's Gini index increased significantly from 0.285 in 2000 to 0.382 in March 2019, which has raised the question of how it may affect social conflict. In one estimate, relative to regions with low income inequality, 28 more violent

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[17]Note that since the access to the Papuan provinces is limited, especially for foreign media correspondents, it is difficult to make a transparent assessment of the situation in the region (Kine, 2017).

Figure 2.1: Frequency of violent incident and intensity, 1998-2014
Source: Calculated from NVMS.
Notes: The geographical coverage for NVMS between 1998 to 2004 is significantly smaller (nine
provinces) than that between 2005 to 2014 (16 to 34 provinces).

incidents are expected to occur in regions with a high Gini index (World Bank, 2016).
Additionally, the gap between rural and urban inequality is also large: 0.317 (rural)
versus 0.392 (urban) as of March 2019. In terms of geographic distribution, three of the
five provinces with the highest levels of income inequality are in Java.

Institutional changes have bred a new and growing type of violence related to local
elections. Heads of sub-national governments (districts and municipalities) were elected
by their respective local parliamentary prior to 2005, but the enactment of Law No.
32/2004 on Regional Governance and Law No. 33/2004 on Fiscal Balance provided the
legal foundations for greater regional autonomy. Consequently, heads of districts and
municipalities are now directly elected by the citizens as part of this decentralisation
wave. This change resulted in local election-related violence that increased from 187
incidents in 2005 to 477 in 2014. Although these violent incidents rarely resulted in
deaths, many people were injured, with approximately 81 people injured for every 100
local election-related violent incidents from 2005 to 2014.

Table 2.3 summarises the number of violent acts by type during the three periods

following Indonesia's independence. While the 1965 anti-communist purge was the worst in terms of the number of casualties, the *Reformasi* era witnessed the largest number of violent events. Importantly, everyday violence stands out during the *Reformasi* era in terms of the number of people killed, and has prompted a number of quantitative studies.

Nevertheless, decentralisation provides the opportunity for local groups to push the national government to create new districts, which reduces grievances at the local level and eventually relieves inter-group tensions (Diprose, 2009). Decentralisation creates incentives for locals to participate in local governments, both in the legislative and executive, given the greater financial and political opportunities. For example, fiscal transfer to regions increased by almost twofold from just 18 per cent of the national budget in 2000 to 33 per cent in 2010.

Signs of the politicisation of ethno-communal identities were visible in recent local elections. In the 2017 Jakarta gubernatorial election, the incumbent—a Christian Chinese person—was controversially sent to prison for blasphemy charges. Amid growing identity politics, ethnicity does not seem to play a significant role in formal Indonesian politics, as indicated by the absence of ethnic political parties (Aspinall, 2016) and by the 2014 National Survey on Social Resilience, which ranked party affiliation the least important factor for selecting the head of district (BPS, 2014). However, religious identity was twice as important as ethnicity, with almost 70 per cent of the respondents agreeing that it influenced their decision.

One of the latest studies identified three issues that contribute to post-conflict violence in Indonesia (Barron, 2019): (i) failed bargains among elites, (ii) the effect of past conflict on community relationships (ethnic grievances) and (iii) weak institutions (particularly the state).[18] Nonetheless, violence does not necessarily occur every time these issues emerge. In particular, significantly large incentives for all three actors—elites, society and the state (including the military)—are required to make violence profitable.

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[18]The definition of post-conflict violence as 'the episodic violence that occurs in areas emerging from extended violence where extended violence has not restarted' (Barron, 2019, p. 19) is rather restricting, as it excludes areas that have never experienced extended violence (i.e., civil wars and extended communal violence). Therefore, Barron's case studies were limited to six districts that experienced this type of violence.

Table 2.3: Numbers and types of violent acts in the history of modern Indonesia

Types	Sukarno era	New Order era	*Reformasi* era
Open confrontation with foreign entity	1 (<1,000)[1]	0	0
Civil war/insurgency	4 (45,000)[2]	3 (35,000)[3]	2 (8,825)[3]
State oppression	N/A	106 (500,000-1,000,000)	2,855 (1,434)
- Large scale	N/A	1 (500,000-1,000,000)[4]	0
- Small scale	N/A	105 (>5,000)[5,6]	2,855 (1,434)[7]
Ethno-communal	N/A	57 (2,256)[5]	1,840 (8,708)[7]
Routine, everyday violence	N/A	685 (189)[5]	19,137 (23,473)[7]

Notes: The numbers in brackets refer to the estimated number of deaths. The proxy for state oppression is violence in the law-enforcement category in the NVMS. [1] Carver (1986). [2]UCDP/PRIO database. [3]Vickers (2005). [4]Cribb (2001). [5]UNSFIR (1990 to 20 May 1998). [6]Including victims of 'Petrus' shooter (see Table 2.2). [7]NVMS (June 1998 to 2014). The numbers are skewed towards violence in the *Reformasi* era because of data availability.

The two non-state actors are important because, in Indonesia, violence is not the monopoly of the state (Colombijn, 2002). Social factions outside the state contribute to violence, as reflected in paramilitary groups, which are usually affiliated with political parties and youth and religious organisations. Non-state factions are sometimes supported by the military for political purposes, as in the case of *Pamswakarsa*, which was born in 1998 and, in later years, became the umbrella organisation for extreme Islamist groups (Mudhoffir, 2017; Hadiz, 2018). Violence by these groups is not simply an expression of self-administered justice, but also a means to seize power (Collins, 2002). In contrast, Cribb (2002) presented a different view and suggested that Indonesia is predisposed towards such groups, as the country witnessed the recurrence of paramilitary groups during turbulent times (e.g., during the 1965 to 1966 anti-communist purge).

Figure 2.2 displays how different support for violence by the three actors predicts the type of violence that will occur. According to this framework, episodic and infrequent violent incidents are usually supported by actors outside the central state. Meanwhile, small, infrequent acts of violence do not seem to require any support from the three actors above, thereby implying that such violence may occur without coordination from
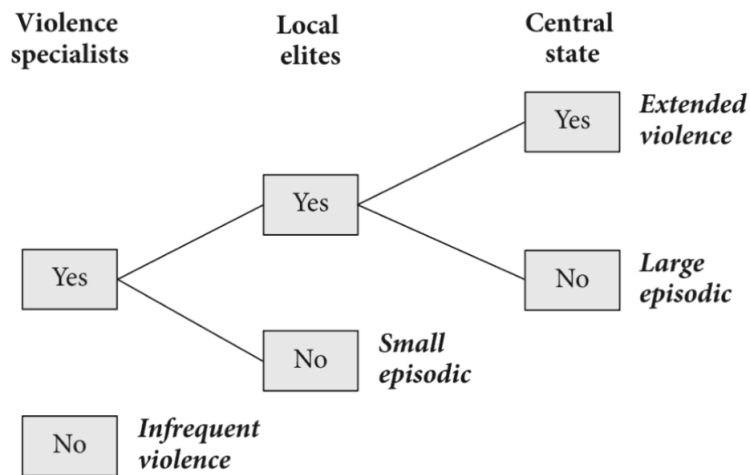
Figure 2.2: Violence actors and types

Source: Barron (2019, p. 42).

the perpetrators.

2.6   Summary

Three broad themes emerged in this chapter: (i) (ethnic and economic) grievances, (ii) institutions and (iii) economic opportunities. These themes are dependent on each other and, together, explain the occurrence of conflict in modern Indonesia. For example, grievance is one of the factors that explain secessionist movements during the New Order, as well as violent incidents during the *Reformasi* era. However, grievance alone would not prolong the conflict in Aceh, unless supported by Suharto's militaristic approach (an institutional factor). Additionally, the large quantity of natural resources in Aceh and Papua (an economic factor) increased the stake of the conflict.

Despite the common themes, the findings in this chapter raise a number of issues regarding how they explain violence in post-conflict Indonesia. For example, several institutional changes only occurred or took effect during this period (e.g., decentralisation) and it would be natural to control for such factors in the empirical model. However, some factors were present before this era and are argued to may have had a long-term effect on recent conflicts. The height of the transmigration program was in the 1980s, but its purported effect on violence (through the mechanism of ethnic grievances) may

reverberated until at least the transition era. In addition, some factors have unclear effects on conflict occurrence. Increased local government revenue following decentralisation may ignite competition among political parties, leading to local election-related violence. However, it also creates space for bargaining among local elites, as the ruling party may share the revenue with the opposition to stymie tension.

These issues can be resolved by reviewing the economics of conflict literature (Chapter 3) as this provides the theoretical foundation for the occurrence of conflict or violence. In addition, Chapter 3 also examines empirical cross-country and Indonesian studies that provide a direct guide for Chapter 4's empirical model.

Beyond Indonesia, the rest of the world could learn from the historical trajectory of post-colonial Indonesia in at least two respects. First, an authoritarian model of government—as in the case of Sukarno and Suharto—would create infighting among the elites, aimed at being the close confidant of the dictator, which resulted in population-wide violence. Such situation would less likely happen in a functional liberal democracy as there will be check and balance from other branches of the government. Second, insurgencies were usually starting with a small support from the population, but when the source of grievances were left unaddressed (or responded with a strong militaristic approach), the movement would quickly escalates to became a large-scale rebellion. This is apparent in the case of the Aceh conflict where the 1989-1998 counterinsurgency operations backlashed and more Acehnese joined the movement. Overall, these lessons show the importance of not only a functional democracy, but also a government that listens to the people and solves the underlying grievances, than the one that only cares with relieving the symptoms by putting more troops on the ground.

Part II

The Antecedents of Violence

Chapter 3

The Economics of Conflict

The second part of this thesis provides a review of the studies examining the antecedents of conflict or violence (this chapter) and an empirical investigation using Indonesian data (Chapter 4). This chapter begins with a review of the theories and empirical findings from cross-country studies examining the occurrence of conflict or violence. It discusses quantitative studies examining conflict in Indonesia, complementing the historical, qualitative explanations of the roots of violence. In sum, this chapter provides the framework that guides the specifications of the empirical model in Chapter 4.

3.1 Introduction

This chapter expands the discussion of the causes of conflict provided in Chapter 2. The literature can be divided, although not exclusively, into three categories that emphasise the importance of: (i) greed, (ii) group grievances and (iii) institutions. Most studies are based on the analysis of cross-country data to understand the occurrence of large-scale conflict, such as civil wars. While these studies provide insights regarding the factors associated with such conflict, these factors may not be important in explaining the routine, everyday violence that occurs in post-conflict Indonesia.

This chapter does not extensively review the literature on terrorism, despite Indonesia's experience of terrorist attacks during the past decade. The number of incidents and casualties caused by terrorist attacks are usually significantly lower than those from other

types of violence. However, some studies have found that terrorism is positively associated
with some ethno-cultural variables, such as ethnic polarisation (Krieger & Meierrieks,
2010), religious fractionalisation (Freytag, Krüger, Meierrieks, & Schneider, 2011) and
ethnic tension (Basuchoudhary & Shughart, 2010). Therefore, this literature does sup-
port a role of cultural diversity in explaining violence (for a compilation of studies on the
determinants of terror, see the appendix of Kis-Katos, Liebert, & Schulze, 2011). Finally,
studies on non-fatal violence in sports (Cuesta & Bohórquez, 2012; Miguel, Saiegh, &
Satyanath, 2008) are also omitted. While it is true that some sports have a high potential
for fatality, such as boxing, they generally have prevention mechanisms that can minimise
such risk.

The remainder of this chapter is structured as follows. Section 3.2 presents explana-
tions and theories on the causes and effects of conflict. Section 3.3 presents a summary of
the studies using cross-country data to examine conflict, while Section 3.4 discusses the
quantitative studies that focus on conflict in Indonesia specifically. Finally, Section 3.5
summarises the chapter.

3.2   What Explains Conflict?

This section examines potential conflict determinants from three theoretical perspec-
tives: (i) rational economic models, (ii) cultural diversity/grievances and (iii) institutions.
Economists and political scientists often use formal mathematical models to posit theories
of conflict. However, such an approach is criticised for reducing conflict to a simple market
problem (Keen, 2000; Vahabi, 2009) and ignoring the role of grievances and institutions
that regulate human interactions, including the use of violence. Also, it is necessary to
note that the grievance hypothesis was developed alongside with the 'greed' or rational
model of conflict (i.e., in Collier & Hoeffler, 2004).

In political science, theories on grievances and conflict can be divided into three
groups: relative deprivation, polarisation (or fractionalisation) and horizontal inequality
(Murshed & Tadjoeddin, 2009). Theories on relative deprivation, for example, argue that
conflict may arise because of the gap between their aspirations and what they actually

achieved. Meanwhile, a polarised or fractionalised societies with salient group identities may lead to conflict for public goods. Lastly, horizontal inequality refers to gaps (e.g., in public spending) between groups, which, again, may resulted in conflict. This section focuses on *ethnic* grievances as ethnicity is a salient feature that strengthened group identities. Moreover, as will be seen in the empirical findings, ethnic polarisation or fractionalisation prominently featured in the regression analysis.

3.2.1 Rationalist Explanations of Conflict

Conflict as a Bargaining Problem

There are five categories of rationalist economic theories, whereby conflict is believed to arise from a bargaining problem between competing parties. The first three categories relate to 'opportunities' (to obtain material gains), 'preferences' (or attitude for hatred) and 'perceptions' (information asymmetries). They are credited to Hirshleifer (1989)—one of the leading authorities in the field of conflict economics. The other two categories— 'incomplete contracting' and 'issue indivisibility'—were proposed by Fearon (1995). In these theories, representative agents in the form of elites are important in determining the conflict outcome.

The opportunistic (materialistic/greed) model is where agents are engaged in com- petition for resources, including by using violent force. In one of the basic versions of the models, agents contest for a prize that can only be obtained through conflict (Garfinkel & Skaperdas, 2007). By producing 'guns' with resources that can be used for positive economic use, agents have a greater probability of winning the contest. Under certain assumptions, a larger prize will induce greater conflict, even after considering the cost of producing guns. These theoretical analyses of conflict relate to representative agent mod- els with Contest Success Functions (CSFs), where the probability of winning is dependent on agents' valuation of winning the prize and exerted efforts (Hirshleifer, 1991). In recent studies, CSF was used to study alliance formation (Konrad, 2014), inter-group conflict (Abbink et al., 2010; Konrad & Morath, 2012) and political stability (Jia & Liang, 2014).

Conflict may also arise from preference incompatibility. Hirshleifer (1995) used an

example from evolutionary biology, where genetic relatedness is thought to be an important factor that explains individuals' willingness to sacrifice for others. Bowles and Gintis (2011) noted that the survival of one group depends on the share of prosocial individuals, leading to in-group generosity and out-group selfishness (parochialism). However, preferences may change following conflict experience. While the research on antisocial preferences indicates spite as a motivation for destructive behaviour (Abbink & Herrmann, 2011; Abbink & Sadrieh, 2009).

Asymmetric information can also lead to conflict. In the simplest case, war occurs when one state miscalculates another state's willingness to enter conflict, as in the case of Japan's miscalculation of the United States' willingness to go to war in 1941. Communication may bridge the information gap, but there are situations where not revealing the truth is preferred. Fearon (1995) elaborated this by arguing that states have incentives to misrepresent (private) information (e.g., to look tough), which reduces the bargaining range. Critics of this approach argue that true fighting capability is quickly observed in the field and, therefore, this theory is unable to explain prolonged wars (Blattman & Miguel, 2010; Fearon, 2004). Another theory based on CSFs predicted the sustainability of peace that was conditional on the material incentive of going to war and the fear of being attacked (Chassang & Miquel, 2010). This model also predicted that, under complete information, stocking guns facilitates peace, which in turns explains the arms race.

Incomplete contracting models do not rely on informational asymmetry to explain conflict. In this approach, a short-term peace contract brokered by elites can be made, yet will not hold in the long term. Backwards induction of a dynamic, two-period game shows that long-term peace is not feasible, since the prize of winning a war in the first period can be carried over to the second period (Garfinkel & Skaperdas, 2007). This result would be stronger when the discount rate is high, and the conflict technology is better.

Finally, issue indivisibility is related to the way issues and disputes are perceived by the conflicting agents. Originally proposed by Fearon (1995), the approach argues that some issues are simply non-negotiable. The prolonged Israel-Palestine conflict is an example of the way in which the unwillingness of both parties to share major religious

sites has brought ongoing violence to the region. To date, there are few economic studies with this theory as the core of its contentions.

Explaining Group Grievances

The theories above focus on models where elites play a large role in the bargaining among adversaries. These theories largely ignore the role of group relations within a society in instigating conflict. The following theories try to explain how variations in groups, such as ethnic groups, can cause conflict. These theories explicitly incorporate *similarities* between ethnic groups in their models.

The first model links conflict with inequality across groups, proxied by three distributional measures (polarisation, fractionalisation and the Greenberg-Gini index divided by total population, G/N) (Esteban & Ray, 1999, 2011).[1] Note that inequality is not restricted to income groups, but can also be between ethnic or political groups. The payoff of an individual in group m exerting efforts r in a conflict with k number of groups is given by:

$$\pi u_{mm} + p_m \frac{\mu}{s_m} - \sum_{n=1}^{k} p_n \pi d_{mn} - c(r),$$

where π is the benefit for all groups (public payoff), μ is the private payoff and $p_{m(n)}$ is the probability of success for group $m(n)$. s_m is group m's population share. Lastly, d_{mn} is the 'distance' or difference in utility between m's ideal policy when n's policy is chosen ($d_{mn} \equiv u_{mm} - u_{mn}$). This inter-group distance captures preferences over public goods.[2] Measuring inter-group distance is important. In a conflict where the groups are similar, the losing side may still receive benefits from the winning group. When the groups are very different, the losers may not receive any benefit. Such situations cannot be captured by the model if inter-group distance is absent.

The equilibrium conflict intensity of this model is determined by individual pref-

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[1]The Greenberg-Gini index is the fractionalisation index weighted by inter-group distance. The distinction between various distributional measures is discussed in Chapter 4 section 4.2

[2]When income group is the focus, the distance is the income gap between each group. When ethno-linguistic group is the focus, the distance can be in the form of similarities in language.

erences and group size, aggregated into the three aforementioned distributional indices. The nature and size of the prize, as well as the level of group cohesion, are important in determining the equilibrium level of conflict intensity, where high levels of polarisation and fractionalisation increase the probability of conflict over public and private goods, respectively, whereas group cohesion increases the effect of both indices.

The second theory emphasises the possibility of individuals changing their identity (Caselli & Coleman, 2013).[3] The cost of changing identity can be in the form of the cost to a person of changing their name and, perhaps more importantly, the feeling of losing their 'real' identity. The cost can be prohibitively high, and changing one's identity is not always possible, such as changing from dark to fair skin.

The utility of an individual from a minority group that 'switches' to the dominant group in a conflict situation is given by:

$$U^S = (1 - \rho) \left[(1 - \varphi)y + \frac{z}{n'} \right],$$

where ρ is the fraction of resource lost from conflict, φ is the cost parameter for switching identity, y is the individual's endowment, and the last term is the (equally-divided) winning prize, z, received by individuals in the (final) dominant group n' that accounts for those who switched.

The model predicts three possible solutions—war, peace or exploitation—that depend on the financial incentives of appropriation by the dominant group. Exploitation occurs when the number of switching is expected to be low. The model also predicts a non-linear relationship between prize size and exploitation. A low prize discourages exploitation, while a large prize motivates those in the minority group to move to the dominant group.

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[3]The authors originally used 'ethnic distance' for the cost of changing one's ethnic identity. However, to avoid confusion with the previous model, a more generic term ('cost') was used in this review instead.

3.2.2   Ethnic Grievances and Cultural Diversity

This sub-section discusses the use of cultural diversity as a proxy for ethnic grievances, which are often used in empirical models, including those used to test the aforementioned theory by Esteban and Ray on inequality and conflict. Cultural diversity is a salient feature that can be easily manipulated to mobilise groups. In studies on ethnonationalist movements, three alternative views regarding the nature of group identities have emerged (Burr & Pitsch, 2003): primordial, instrumental and constructivist. The primordial argument views ethnonationalism as a manifestation of a group of people sharing a similar common ancestor and culture. The instrumental argument views ethnic identity as a means by political elites to obtain power, where they may condone the use of violence. The constructivist approach views ethnicity as, to some extent, a construction by individuals trying to revive traditions or other national identities.[4]

There are three broad theories that seek to explain the relationship between cultural diversity and conflict or civil war. The dominant one, often referred to as 'threat'— or group grievances—theory, asserts that violence and conflict are more likely to arise in diverse environments because of cultural or ethnic groups being threatened by other groups (Blalock, 1967). Threats might stem from access to resources, jobs and income, but also to a group's cultural values and identity. Such threats and grievances grow as the size of out-groups increases. Further, such threats are exacerbated by some groups having greater power than others, and when discrimination occurs (Easterly & Levine, 1997).

An alternative theory, often called 'contact' theory, asserts that a high level of ethnic diversity minimises the chances of conflict because of interactions between groups that overcome stereotypes and biases (Allport, Clark, & Pettigrew, 1954). The potential implication of the theory is that, as out-groups grow in size, the likelihood of inter-group contact and interaction increases, and, as negative stereotypes are dispelled, the chance of conflict between groups falls. Moreover, democracy might be promoted in ethnically

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[4]These views need not be mutually exclusive, as the primordial argument may be true in the short term, but groups' identities may change in the long term, which brings the constructivist argument into play.

diverse countries, since it will be very unlikely that one ethnic group will dominate political power (Reilly, 2001).

An intermediate theory suggests that the relationship between diversity and conflict is non-monotonic. Specifically, the relationship between ethnic diversity and the risk of conflict takes the form of an inverted-U shape. As argued by Horowitz (1985), very low and very high levels of diversity are associated with a low probability of conflict, but mid-levels of fractionalisation engender conflict. Horowitz seminal work was followed by Collier and Hoeffler (1998), who modelled conflict as a collective decision and introduced coordination costs that accrue from changing individual decisions into collective ones. The higher these coordination costs, the lower the probability of conflict. They argued that an ethnolinguistic fractionalisation index (ELF) (which measures the probability that any two citizens will be drawn from a different ethnolinguistic group) provides a good proxy for these costs. At low levels of fractionalisation, coordination costs would be high, since virtually everyone is from the same group and there would be little distinction between them; thus, provoking conflict would be difficult. Coordination costs would also be high (and the risk of conflict low) when levels of fractionalisation are high, since potential rebels would need to coordinate across multiple ethnic groups. Therefore, the risk of conflict is highest in the middle range of the fractionalisation index.

Theories that relate cultural diversity or group grievances to conflict can be criticised on several grounds. First, the mobilisation of people to conduct violence might not be relevant when the prize of conflicts is small. Individual person could just engage in a violent act without waiting for other people to join. Second, following Barron (2019), it is unclear how much influence elites hold over society in a post-conflict period. A diverse society may remain in peace when elites agree to cease conflict; alternatively, elites manipulating existing grievances can lead to conflict recurrence (as in the instrumental argument discussed in the early part of this sub-section). Third, group grievances may not necessarily lead to violence when individuals are unwilling to participate. For example, Caselli and Coleman (2013) theory discussed above tries to capture this issue by assuming that people can migrate to another identity group. Finally, societies are not living in a

vacuum, as there is a set of rules that govern the way people live and behave. Building on this point, the next sub-section discusses the importance of institutions in containing conflict.

3.2.3 The Role of Institutions

Institutions are defined as 'the rules of the game in a society or, more formally ... the humanly devised constraints that shape human interaction' (North, 1990, p. 3). Therefore, institutions are mutable: when a set of rules is deemed irrelevant to existing social interactions, an alternative may be proposed. Consequently, social orders—the patterns of social organisation—change following adjustments in institutions. Different social orders dictate how violence is contained in a society; where most of the world today is still in the form of a 'natural state' as political systems are actively used to control violence and regulate social and economic activities (North et al., 2009). However, some countries or states have developed an open access order, where legitimate use of violence is consolidated under political systems and further constrained by a set of rules. In addition, the transition from natural states to an open access order requires a set of rules of law for the elites, as well as perpetually lived private and public elite organisations (e.g., the state itself).

Organisations such as the state are thought to have emerged to consolidate the power to enforce norms that are needed to prevent widespread conflict. Given that states are expected to have a monopoly over the use of violence, a research agenda has been devoted to understanding the ways states could achieve such a goal. In one of the theories, weak or absent state intervention permits the use of decentralised punishment mechanisms, such as vigilantism, to enforce order (Fearon & Laitin, 1996; Taylor, 1982). When the means of violence is centralised, at the hand of the state, its interaction with existing (formal and informal) institutions might alter the incentives for handling order. Following the works of Fearon and Laitin (1996), Tajima (2013) proposed a game-theoretic model, where two local communities face different incentives to either restrain their in-groups or punish out-groups. The game has multiple equilibria that depend on the degree of state

security intervention in dealing with communal violence. Specifically, the vigilantism equilibrium—where both communities are better off punishing out-groups—exists when there is heavy state intervention in the area. According to this view, the breakdown of state institutions may result in a higher likelihood of communal violence.

Many of the rules are codified into formal institutions, but some persist as relation-based informal institutions that tend to be stronger in developing countries (Boesen, 2007). Informal, relation-based institutions are useful, as they have low establishment costs and are effective in small societies. Nonetheless, because they do not have a written set of rules, they may lead to indefinite enforcement of norms, some of which could lead to violence. Therefore, it is necessary to consider how institutions, whether formal or informal, may affect social order—particularly the incidence of violence.

The limitation of an institutional approach to violence is that it may not be wholly sufficient to explain within-country variations in violence. This is particularly evident when the state is the focus. Rules and structures are generally established at a national level and implemented equally across different sub-national governments (Barron, 2019). Alternatively, one could exploit a specific facet of institutional arrangements that may explain violence.

3.3   Cross-country Empirical Findings

This section summarises the results from cross-country empirical studies to provide an empirical picture of the correlates of conflict. These studies typically used longitudinal data with a binary dependent variable taking the value of one for the onset or incidence of civil war (e.g., defined as internal conflict with at least 1,000 people killed) and zero otherwise. Early works on this topic (Collier & Hoeffler, 2004) used and updated the Correlates of War data (Singer & Small, 1994), but other researchers either developed their own measure of civil conflict (such as Fearon & Laitin, 2003) or used data from UCDP/PRIO (Gleditsch, Wallensteen, Eriksson, Sollenberg, & Strand, 2002).

The past decade has witnessed strong growth in the number of empirical studies examining the source and role of cultural diversity in shaping macro and socioeconomic

processes. The operational variables for cultural diversity are usually distributional indices, such as the ethnolinguistic fractionalisation or polarisation indices calculated from the *Atlas Narodov Mira* (ANM) dataset (Bruk & Apenchenko, 1964).

Posner (2004) criticised distributional indices because they cannot capture the different depths of ethnic division, particularly when the indices are based on ANM data that were collected in the 1960s, given that geographical distribution and composition of ethnic groups may be different today. To overcome this, he constructed a list of ethnic groups that were relevant for African countries to calculate the fractionalisation index. His approach is similar to the 'Fearon groups', which use various data sources to construct a list of relevant ethnic groups that is also used to measure ethnic fractionalisation by country (Fearon, 2003). 'Fearon groups' have been used in empirical studies to assess whether cultural diversity may have a role in increasing the risk of conflict (Cederman & Girardin, 2007; Esteban, Mayoral, & Ray, 2012; Fearon, Kasara, & Laitin, 2007; Fearon & Laitin, 2003).

Further, researchers have incorporated cultural or linguistic distance in the construction of the indices (e.g., Esteban & Ray, 2011; Fearon, 2003) or created alternative measures (e.g., the N* index that captures peripheral groups' interactions with the ethnic group currently in power) (Cederman & Girardin, 2007). The N* index is uniquely designed to analyse ethnonationalist wars and, therefore, may not be relevant to other types of conflict.

Ethnic oppositions can also be elicited using group-level analysis. Researchers associated with the 'Uppsala group' disaggregated ethnic group data into spatial maps and estimated the likelihood of a dyadic conflict between the dominant and periphery ethnic group (Buhaug, Cederman, & Rød, 2008; Cederman & Girardin, 2007). Consequently, the usual metrics of ethnic heterogeneity became irrelevant, since dyads (pairs) of ethnic groups were used as the level of analysis. Using geo-referenced data has the advantage of enabling a large sample size (8,969 geo-referenced polygons for 929 ethnic groups), yet lacks other information, especially economic information, that could explain conflict at that level. Consequently, GDP data, for example, must be aggregated at the country/state

level or proxied with other variables (e.g., road density) (Buhaug & Rød, 2006).

The quality of institutions, especially regarding democracy, in cross-country analyses is often taken from the Polity project (Marshall, Jaggers, & Gurr, 2002). However, most of the measures are the outcomes of existing institutional arrangements, which do not necessarily reflect their predisposition to the rule of law (Easterly, 2001). In addition, measures of quality are usually based on general outcomes of institutional arrangements—bureaucratic quality, democracy and political rights—that do not account for other aspects of institutions, such as the presence of community organisations that provide the means for social bonding, the quality of the business environment or country-specific institutional arrangements.

Table A.1 in the appendix summarises the literature on the way that economic factors, cultural diversity and institutions are correlated with conflict.[5] Countries' economic characteristics are argued to better predict the probability of civil war than grievance factors (e.g., ethnic diversity) (Collier & Hoeffler, 2004; Fearon & Laitin, 2003). Nonetheless, many studies have found a detrimental effect of cultural diversity on violence (Cederman & Girardin, 2007; Desmet, Ortuño-Ortín, & Wacziarg, 2012; Esteban et al., 2012; Montalvo & Reynal-Querol, 2005). Interestingly, the effect of cultural diversity can be non-linear, as in the context of post-war periods, where the variable has an inverted-U relationship with peace breakdown (Mason, Gurses, Brandt, & Michael Quinn, 2011).[6] However, such a non-linear effect was not observed in the context of civil war onset or prevalence (Elbadawi & Sambanis, 2002).

There is mixed evidence regarding the way institutions affect conflict. Some cross-country empirical investigations indicate that better institutional quality is associated with a lower probability of conflict (Collier & Hoeffler, 2004), and high institutional quality cancels out the effect of ethnic diversity in explaining war casualties (Easterly,

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[5]Cultural and institutional variables (column 4) are specifically included in the table, since the focus of this thesis is on the way cultural diversity affects violence. The importance of economic factors is examined in the last column on main findings.

[6]The authors use hazard models with the length of peace duration after any civil war as the dependent variable and a quadratic function of ethnic fractionalisation index as one of the independent variables. They find consistent results where peace is expected to be longer in very homogeneous or highly fragmented countries.

2001). Interestingly, when various measures of cultural heterogeneity are included, the importance of institutional variables diminishes (Esteban et al., 2012). There is also an apparent puzzle whereby democracy is positively associated with civil wars (Cederman & Girardin, 2007).

Given that the focus of this thesis is violence in post-conflict Indonesia, a country-specific review of the literature provides deeper insight. Country studies outside Indonesia have identified the factors associated with local violence, including economic and geographical conditions in Nepal (Do & Iyer, 2007), cultural diversity in Liberia (Blair, Blattman, & Hartman, 2017) and population growth in Sub-Saharan Africa (Witmer, Linke, O'Loughlin, Gettelman, & Laing, 2017). After reviewing 60 primary studies, Hsiang, Burke, and Miguel (2013) found a consistent association between environmental shocks and various types of human conflict, including personal violence, such as aggressive behaviour, violent crime and domestic violence.

Specifically, on the effect of cultural diversity, a country level analysis can capture within-country spatial distributions of ethnic groups—something that is not feasible in cross-country studies. This is particularly important in countries with a considerable number of ethnic groups and vast geographical areas, such as India and Indonesia. For example, Urdal (2008) found that linguistic fractionalisation was associated with a higher incidence of armed conflict in India, while religious heterogeneity was positively correlated with Hindu-Muslim riots. The next section discusses the findings from quantitative studies on Indonesia specifically, and explores how cultural diversity is captured empirically.

3.4 Quantitative Studies of Conflict and Violence in Indonesia

This section expands the discussion in Chapter 2 by reviewing the quantitative studies that examined the factors contributing to violence in Indonesia. The results from these studies can once again be categorised into those finding that violence is associated with: (i) economic development, (ii) group grievance and (iii) institutions. The findings from this

section inform the next chapter's empirical investigation, which uses sub-national-level data. The sub-national analysis provides insights that complement the lab-in-the-field experiment, particularly regarding the role of cultural diversity in violent behaviour.

Indonesia is ranked 23rd (out of 151 countries) in terms of cultural diversity (as measured by the ELF taken from the original 1961 ANM dataset), and, among other Asian countries, sits only beneath India and the Philippines. Indonesia is still ranked moderately highly (31st out of 179 countries) in the updated 1985 ELF (Roeder, 2001). The latest population census indicates that the country has 964 ethnic groups, while Ethnologue documents more than 700 living languages (Simons & Fennig, 2017). Using the ANM as the basis for estimating cultural diversity in Indonesia is inappropriate because it only covers 10 languages in its original dataset.

Most of the studies in this section were based on data from the last two decades (the oldest year covered is 1990)—a period that witnessed two significant attempts of secession (the Aceh and Papua insurgency). Some of the data also excluded regions experiencing insurgencies. Consequently, these studies were generally concerned with local violent conflict, rather than extended conflict, such as civil wars. Many of the studies in Indonesia used the UNSFIR data, where the first wave covered the period from 1990 to 2001 and used national newspapers articles for its source. The second wave used both national and provincial newspaper articles and had a slightly broader time span (1990 to 2003), but at the cost of only covering 14 provinces (compared with 26 provinces in the first wave) (Tadjoeddin, 2002; Varshney, Tadjoeddin, & Panggabean, 2008). In practice, researchers combine both waves for conflict analysis. The use of newspaper articles to collect data on violence in Indonesia is not limited to local news outlet, as data can also be obtained from overseas sources (e.g., Australia's Sydney Morning Herald in Rohner & Saia, 2019).

Another source of data on violence is the village census (*Potensi Desa*, Podes), available every three years from 2003. However, the Podes data have been criticised for a lack of consistency and their particularly strong reliance on village heads' reports (Barron et al., 2016). UCDP/PRIO's grid-level data have also been used to understand maritime piracy—a form of criminal violence—as 25 per cent of global incidents occur in or around

the Indonesian territory (Daxecker & Prins, 2016).

Many of the latest studies used data from the National Violence Monitoring Survey (NVMS) that are publicly available from mid-2016 from the World Bank's website (World Bank, 2018). The data collection was a collaboration between the Indonesia's Coordinating Ministry for People's Welfare, the Habibie Center and the World Bank. It is considered the most comprehensive survey on violence in the country (Barron et al., 2016). The NVMS also uses newspaper articles, and this practice is widely regarded the best way to collect violence data in Indonesia (Varshney, 2008). The NVMS data are available from 1997 to 2014, but their coverage varies among 34 provinces (see Table A.2 in the appendix). The number of districts/municipalities in the NVMS increased from 256 in 2005 to 279 in 2013 because of district proliferation.[7]

The NVMS not only records incidence of violence and the number of people involved, but also the number of casualties (people killed or injured). The survey categorises an event as violent if it is intentional and causes physical harm to humans or property. The data can also be broken down into violence in conflict and non-conflict situations. The former includes conflict over natural resources, governance, executive/legislative elections, identities, vigilantism and separatism, while the latter includes general crime, violent incidents from law enforcement and domestic (household) violence.

Table 3.1 summarises the quantitative studies on conflict and violence on Indonesia. Unlike most cross-country studies, where the dependent variable is a binary dummy for civil war, many quantitative conflict studies in Indonesia use the number of violent incidents instead. In addition, while some studies focus on the factors that explain ethno-communal violence, many are interested with general everyday violence.

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[7]Divided by regions, the provinces covered in 2005 to 2013 are: (i) Eastern Indonesia (Maluku, Maluku Utara, Nusa Tenggara Barat, Nusa Tenggara Timur, Papua, Papua Barat); (ii) Java-Bali (DKI Jakarta, Jawa Timur); (iii) Kalimantan (Kalimantan Barat, Kalimantan Tengah); (iv) Sulawesi (Sulawesi Selatan, Sulawesi Tengah, Sulawesi Utara), and; (v) Sumatra (Aceh, Lampung, and Sumatra Utara).

Table 3.1: Quantitative conflict studies on Indonesia

Source	Coverage and source	Dependent variable	Cultural diversity regressor	Main findings
(1)	(2)	(3)	(4)	(5)
Chen (2007)	100 villages (excluding Aceh and Papua), 1997-1999; UNSFIR	Social violence	Religious intensity (household level), per capita religious institution (village level)	The positive association between religious intensity and social violence was stronger after the 1997 crisis.
Tadjoeddin and Murshed (2007)	Javanese district, 1990-2003; UNSFIR	Number of routine violent incidents	None	Non-linear (inverted-U curve) relationship of education and income with number of routine violent incidents. Population size was positively associated with routine violence.
Mancini (2008)	193 districts, 1997-2003; UNSFIR	Dummy ethnic violence	ELF, ethnolinguistic polarisation, religious polarisation	In ethnically diverse districts, religious polarisation positively increased the likelihood of ethnic conflict. Horizontal inequality (in health and political) increased the likelihood of ethnic conflict.
Barron, Kaiser, and Pradhan (2009)	50,530 villages (excluding those in high conflict provinces), 2003; Podes	Dummy violent conflict (cases with material damage)	Ethnic diversity index, ethnic clustering, share of Javanese outside Java	Ethnic clustering and low enactment of property rights were associated with a higher likelihood of violent conflict. Horizontal inequality in education decreased the likelihood of violent conflict.
Murshed, Tadjoeddin, and Chowdhury (2009)	Javanese district, 1990-2003; UNSFIR	Number of routine violent incidents	None	Fiscal spending after decentralisation and share of government budget to GDP was associated with lower occurrence of routine violence.
Østby, Urdal, Tadjoeddin, Murshed, and Strand (2011)	25 provinces, 1990-2003; UNSFIR	Dummy routine and episodic violence	Religious polarisation	Religious polarisation and horizontal inequality could not explain the likelihood of violence. GDP per capita and population size were important in predicting violent outbursts.
Tadjoeddin, Chowdhury, and Murshed (2012)	980 Javanese district-year, 1994-2003; UNSFIR	Number of routine violent incidents	None	Districts with both high population density and growth experienced more violence. Income inequality positively predicted violence.
Tadjoeddin (2013)	255 district-year, 1997-2002; UNSFIR	Categorical variable for ethnic violence	None	Income-welfare gap (as a proxy for relative deprivation-related grievance) was positively associated with ethnic violence.

Source	Coverage and source	Dependent variable	Cultural diversity regressor	Main findings
(1)	(2)	(3)	(4)	(5)
Tajima (2013)	51,913 villages, 2003 and 2005; Podes	Dummy communal violence	Ethnic and religious fractionalisation, ethnic and religious clustering, dummy for Muslim majority village, dummy for majority Javanese villages outside Java	Greater military presence lowered the risk of communal violence. Ethnic fractionalisation and clustering were associated with higher communal violence. Javanese villages outside Java tended to be peaceful, but the size effect was comparably small among other covariates.
De Juan, Pierskalla, and Vüllers (2015)	60,000 villages, 2003; Podes	Dummy mass fighting	Ethnic inequality, fractionalisation, and polarisation; religious inequality, fractionalisation, and polarisation; religious institutional polarisation and fractionalisation; local religious institutions density	Negative association between the probability of mass fighting and the density of local religious institutions.
Caruso, Petrarca, and Ricciuti (2016)	108 province-year, 1993-2003; UNSFIR	Number of violent incidents	None	Lower paddy production because of increased minimum temperature led to a higher number of violent incidents.
Daxecker and Prins (2016)	2,367 grids (2,340 in Indonesia, 27 in Malacca Straits), 1998-2000 and 2003-2005; UCDP/PRIO	Number of piracy incidents	None	Small winning margins from local elections associated with more piracy, indicating that pirates increased their criminal activity to signal their strength to the potentially new government.
Gubler, Selway, and Varshney (2016)*	175 district-year, 1997-2014; NVMS	Number of Muslim-Christian violent incidents and fatalities	Religious-income cross-cuttingness and religious-geographic cross-cuttingness	Positive association between cross-cuttingness (the degree that groups on one cleavage, such as ethnicity, are distributed among groups on other cleavages, such as social class) with inter-group communal violence.
Tadjoeddin et al. (2016)*	664 district-year, 2005-2012; NVMS	Number of routine violent, violent crime and ethnic violent incidents	Ethnic and religious fractionalisation	Income inequality associated with violence in provinces that previously experienced extended conflict. Ethnic fractionalisation negatively predicted routine and ethnic violence.
Pierskalla and Sacks (2017)	915 district-year, 2001-2010; NVMS	Number of violent incidents	Ethnolinguistic fractionalisation and ethnic majority	Positive association between service delivery and violence. Negative association between district head election and district split on violence.

Source	Coverage and source	Dependent variable	Cultural diversity regressor	Main findings
(1)	(2)	(3)	(4)	(5)
Bazzi and Gudgeon (2018)*	133 districts, 2000-2014; NVMS	Dummy social conflict	Ethnolinguistic fractionalisation and polarisation with linguistic distance, and change in diversity	District splitting increased conflict if the new region became more (ethnically) polarised. In contrast, conflict reduced when district proliferation created a more homogeneous population.
Bazzi, Gaduh, Rothenberg, and Wong (2019)	244 villages, 2000-2014; NVMS; 817 villages, 2002-2014; Podes	Dummy ethnic conflict	Ethnolinguistic fractionalisation and polarisation	Fractionalisation (polarisation) was negatively (positively) associated with the occurrence of ethnic conflict.
Indra, Nazara, Hartono, and Sumarto (2019)	120 provinces, 1990-2012; Podes	Number of social conflict	Ethnic fractionalisation	Ethnic fractionalisation, income polarisation and income inequality were positively correlated with social conflict.
Rohner and Saia (2019)*	289 districts, 1955-1994; newspaper articles (NVMS, GDELT, ICEWS in robustness checks)	Dummy violent conflict	Religious polarisation	Using a quasi-natural experiment of 1974-1978 school construction programs, education was found to reduce conflict. This effect was larger in polarised districts.

Notes: Sorted by year of publication. *Working papers.

3.4.1 Economic Development and Grievance

Income, as measured by GDP per capita, has at least some degree of positive association with routine violence, suggesting that violent incidents tend to occur in rich regions (Barron et al., 2009; Østby et al., 2011; Pierskalla & Sacks, 2017; Tadjoeddin & Murshed, 2007). However, poverty, another measure of economic wellbeing, is also positively associated with violence. Together, these results suggest that regions with high per capita income yet a large number of poor people tend to have a high level of violence.[8] Relatedly, vertical inequality, as measured using a Gini coefficient, is positively associated with violent incidents (Tadjoeddin et al., 2012, 2016). Using the school construction program as a quasi-natural experiment, education was found to have a positive effect on peace, particularly in religiously divided districts (Rohner & Saia, 2019).[9]

As shown in column 4 of Table 3.1, studies typically control for cultural diversity but only one study (Bazzi & Gudgeon, 2018) that take into account linguistic distance. The effect of cultural diversity on the incidence of violence is mixed. Several studies suggest a negative effect of cultural diversity. For example, ethnic fractionalisation was found to be positively correlated with social conflict, although the data were at province level (Indra et al., 2019). In another study, increased cultural diversity in newly created districts tended to be followed by a rising likelihood of social conflict (Bazzi & Gudgeon, 2018). Ethnic clustering was also found to be associated with a higher likelihood of violent conflict (Barron et al., 2009). Meanwhile, in ethnically diverse districts, religious polarisation increased the likelihood of ethnic conflict (Mancini, 2008). In contrast, two studies indicated the potentially pacifying effect of cultural diversity on violence, although there was clearly no consensus on how it operates. One study found ethnic fractionalisation to be negatively associated with violence at district level (Tadjoeddin et al., 2016). Similarly, a recent study on the long-term effect of transmigration found that, among transmigra-

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[8]Thirty districts/municipalities in 2014 had higher than average for both income and poverty (including major cities, such as Surabaya, Makassar, Semarang, Medan, Palembang and all four municipalities in Jakarta), and most were located in Java. This suggests that the country capital, along with major cities (particularly in Java), are potential hot spots for violence in Indonesia.

[9]INPRES programs were made possible from the massive oil revenue that the government enjoyed during the 1970s, where the funds were allocated to a large number of school and road construction projects (B. Smith, 2007). It is considered one of the largest and fastest school construction programs in the world.

tion villages, fractionalisation tended to decrease the likelihood of ethnic conflict, yet the effect of polarisation was in the opposite direction (Bazzi, Gaduh, et al., 2019). Finally, two studies could not find a direct effect of ethnic diversity on the incidence of violence (De Juan et al., 2015; Pierskalla & Sacks, 2017).

All studies treat cultural diversity as purely exogenous, yet this assumption may not hold if studies neglect some unobserved variables that could explain both cultural diversity and socioeconomic processes. This is exactly the case of Indonesia, where there have been indications of a changing demographic composition resulting from a transmigration program that permanently displaced people from Java to the outer islands. The scale of the program was significant, with 3.5 million people relocated between 1979 and 1989 (Fearnside, 1997).[10] Some studies used the presence of Javanese outside Java as a proxy for the effect of the population resettlement program. One study (Barron et al., 2009) considered the share of Javanese outside Java (zero for villages in Java), while another study used a dummy of Javanese-majority villages outside Java (Tajima, 2013). However, it can be argued that this variable might not be a good proxy for the program and could not fully capture its effect on societal relations. For example, as explained in the previous chapter, Javanese transmigrants were spared during the conflict in Maluku and Kalimantan. In addition, the intimidation of the Javanese in Aceh was mainly undertaken by GAM combatants, rather than by fellow (Acehnese) neighbours (Barter & Côté, 2015). Nevertheless, in both studies, the sign of the coefficient was negative (although insignificant in the former), indicating that, relative to Java, areas with a large Javanese population outside Java tend to experience *lower* levels of violence. These findings can be interpreted as evidence *against* the argument that the transmigration program ignited social conflict with the local population.

Finally, while cultural diversity is often used as a proxy for group grievances, researchers have also used different proxies. For example, measuring horizontal inequality between cultural groups using a coefficient of variance (Mancini, 2008; Østby et al., 2011;

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[10]The transmigration program began even before the country's independence, but the program was up-scaled significantly during Suharto's era, especially between 1974 and 1989. In addition, there were also independent migrants who resettled to the outer islands without direct help from the government.

Stewart, 2008; Tadjoeddin et al., 2016). However, this approach has limited operational application, since the relevant data are only available in certain years. For example, the annual Socioeconomic Survey—whose data are used to construct inequality—did not ask about ethnic identity. Consequently, researchers must resort to cross-section data from the Demographic and Health Survey (province level; conducted every five years) or Inter-censal Survey (district level; conducted every ten years). Another approach is to estimate relative deprivation, which measures inter-regional gaps, such as between income and human development or between education and poverty (Tadjoeddin, 2013). This approach has greater practicability, since the data are widely available, yet it does not directly capture ethnic grievance that motivates violence.

3.4.2 Institutions

Institutions are also associated with conflict and violence. A low enactment of property rights—as proxied by reported land ownership, land titling and communal land—is associated with a higher likelihood of violent conflict, based on the 2003 village census (Barron et al., 2009). Specifically, unclear land ownership allows conflicting land claims, which instigates conflict.[11]

A higher density of religious institutions is negatively correlated with the probability of mass fighting (De Juan et al., 2015), similar to other countries, such as Ghana and Nigeria (MacLean, 2004; Scacco & Warren, 2018). In particular, conflict resolution was more likely via village-level institutions than through formal security apparatus. The religious institution variable was proxied by the number of worship places per capita at village level. Place of worship was selected because it is the centre of religious activities, where elites meet with members of the community and spread their teaching.

Decentralisation, through the creation of new districts and transfer of power, appears to cause a reduction in the incidence of violence, although better public service

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[11]In Java, land issues are important because there are three uses of *tanah bengkok* (lands owned by the village): (i) use by village leaders as compensation for their office duty, (ii) use by village leaders for village infrastructure development and (iii) use by retired village leaders as 'retirement plans' (which will be returned to the villages once they pass away). This unique arrangement provides the opportunity for conflict when candidates compete in village head elections.

delivery is, surprisingly, positively associated with violence (Pierskalla & Sacks, 2017).[12] However, social conflict is more likely when the new district becomes more polarised (Bazzi & Gudgeon, 2018). A competitive local election brings unintended consequences, as it is associated with increased maritime piracy (Daxecker & Prins, 2016). However, a general measure of institutional quality is not associated with social conflict in Indonesian provinces (Indra et al., 2019).[13]

A change in social orders—when the police were separated from the military in 2000—contributed to rising violence (Tajima, 2013). During the New Order era, villages closer to police posts tended to depend on the latter for security, which eventually impaired the role of informal institutions for local security. These villages tended to have a higher incidence of communal violence following the military reorganisation during the transition era. Tajima used distance to community health clinics to instrument the distance to police posts and confirmed the latter to be negatively associated with communal violence. This finding highlights the need for alignment between formal and informal institutions at the village level.

3.5   Summary

This chapter has reviewed the current theoretical and empirical literature on the economics of conflict. Most economic theories on conflict are based on rational agents maximising their utility, but there are other channels through which conflict may occur, such as through a change in parochial norms and preferences. Another channel is the way in which group grievances impede the provision of public goods when society is divided along different groups (e.g., ethnic groups). Changes in social orders can also contribute to violence, as each order has different ways of containing violence.

Cross-country studies have yielded several findings that can be categorised into three factors that contribute to conflict: level of economic development, group grievance and

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[12]The authors attribute the high expectation and inequality in developed regions as factors that explain the surprising association between violence and service provision (an index of public service delivery that comprises education, health and sanitation outcomes).

[13]The variable is an index that comprises legal certainty, apparatus and service, local regulation and local finance.

institutions. In particular, the role of grievances, which are usually proxied by distributional indices, such as polarisation and fractionalisation, is explicable when the outcome of interest is large-scale conflict. This is because most of the literature focuses on the cause of civil wars, where rebel groups are trying to recruit combatants, which is presumed to be a difficult task when the society is homogeneous. However, in the context of small-scale violence, fragmentation might not be directly associated with group grievance and its relationship can be non-linear. Therefore, while empirical investigations generally support theoretical predictions in civil war settings, it remains unclear whether the theories have strong explanatory power in the context of within-country everyday violence.

Similar to the findings in cross-country studies, the three main factors that contribute to violence are also present for the case of Indonesia. However, most of the studies on Indonesia have tended to focus on violence during the turbulent era (1998 to 2005). To date, only a few studies have examined the violent events during the post-conflict period. All except one study failed to consider ethnic groups' similarities, and therefore potentially overestimate the degree of cultural diversity in regions where the ethnic groups were similar (e.g., speaking similar language). If left unaddressed, this would resulted in a measurement bias of the cultural diversity variable. Furthermore, its association with violence might not reflect its true relationship in the population.

The review of literature in this chapter provides a framework for the empirical investigations of Chapter 4. First, the incorporation of economic, grievance and institutional factors in the estimation models is essential, given their importance in predicting violence. However, this approach assumes the variables to be exogenous. Cultural diversity is always treated as exogenous, yet this assumption may not hold if there are unobservable factors that may affect both the variable and violence (e.g., the transmigration program). Consequently, the empirical model must be able to account for this issue.

Second, recent studies have treated cultural diversity more carefully by addressing ethnic groups' similarities. This approach is crucial given Indonesia's numerous, yet similar, ethnic groups, where ignoring group similarities could overestimate the levels of cultural diversity in districts.

Third, the relationship between cultural diversity and violence might not be linear as indicated in previous studies (e.g., Mason et al., 2011). This can be empirically tested by using a quadratic function in the regressions. Lastly, a theoretical model based on the rationalist approach that links ethnic diversity with violent conflict (Esteban & Ray, 2011) can also be tested. The theory is important because it provides the mechanism of how the various measures of ethnic diversity affect conflict differently (i.e., high levels of polarisation and fractionalisation increase the likelihood of conflict over public and private goods, respectively). However, it is unclear whether the model has the same explanatory power when it is used to analyse small-scale violence. In addition, as described in Chapter 2, an argument has been made regarding violence in post-conflict Indonesia, where small, non-episodic and infrequent violence does not necessarily require coordination among the three actors (violence specialists, local elites and the central state) (Barron, 2019). Hence, a representative agent model, for example, may be unable to fully explain such violence.

Chapter 4

The Antecedents of Violence in Post-conflict Indonesia: An Empirical Investigation

This chapter uses secondary data to examine the antecedents of violence (economic, grievances and institutional factors) in Indonesia. Every year, tens of thousands of violent incidents across Indonesia result in personal injury, loss of life and property damage. This study uses district-level data to examine the determinants of non-domestic, small-scale violence in Indonesia, with a focus on the role played by cultural diversity. Consistent with theoretical models of conflict, the findings strongly suggest a non-linear relationship between cultural diversity and violence. The relationship between the two is initially positive, but turns negative after a diversity threshold is reached. This finding is robust to the use of instrumental variables as a way to mitigate endogeneity problem, to alternative measures of cultural diversity and to different measures of violence. The chapter concludes with some implications for policy.

4.1   Introduction

Around 1.36 million people were killed in armed conflicts globally from 1989 to 2017, with the peak in 2014 witnessing 104,769 deaths (Allansson & Croicu, 2018; Gleditsch

et al., 2002). Three regions—Africa, Middle East and Asia—contributed to more than
90 per cent of these deaths. Nonetheless, the number of violent incidents and deaths
in non-conflict situations was comparatively much higher. For example, in 2016 alone,
more than 460,000 people were violently killed (Mc Evoy & Hideg, 2017). An analysis
of non-conflict violence is usually focused on one country, using data at regional or state
level. For example, studies have examined the effect of gun ownership on homicide in
the United States (Gius, 2009), the effect of inequality on homicide in Brazil (Menezes,
Silveira-Neto, Monteiro, & Ratton, 2013) and the role of economic development in routine
violence in Indonesia (Tadjoeddin & Murshed, 2007).

Qualitative studies on the history of conflict (discussed in Chapter 2) suggest that
ethnic grievances and economic motives are two important factors that precede violence.
Institutional arrangements with respect to a country's security forces can also be associ-
ated with conflict, although this is more related to large-scale, rather than small-scale,
violence with low fatality rates, which is prevalent in post-conflict Indonesia (Barron et
al., 2016). Moreover, unlike large-scale and episodic violence, the eruptions of small-scale
violence do not necessarily require coordination among violent actors (Barron, 2019).
Similarly, the quantitative studies summarised in Chapter 3 confirm these factors as an-
tecedents of violent conflict, in addition to a number of institutional aspects such as
decentralisation and informal institutions.

The availability of the sub-national level data from the NVMS enables a thorough
examination of violence in Indonesia. Therefore, in this chapter, two research questions
are posed: 1) Do economic motives, ethnic grievances and institutional factors precede
violence? 2) How does cultural diversity that proxied ethnic grievances explain violence,
if any?

The regression results using district-level data suggest that the intensity of violence
in Indonesia—defined as the log of non-domestic violence per million people—has an
inverted-U shape association with cultural diversity, taking into account linguistic dis-
tance and mitigating the potential issue of endogeneity. Nevertheless, most districts have
levels of diversity below the threshold that suggests that violence intensity is generally

expected to be higher in culturally diverse districts. In addition, GDP per capita is uncorrelated with the intensity of violence, while income inequality is found to have a positive association with violence when regional fixed effects are accounted for.

The structure of the remainder of this chapter is as follows. Section 4.2 discusses the data and the methodology, while Section 4.3 presents the patterns of violence and cultural diversity. Section 4.4 displays the regression results, followed by robustness checks in Section 4.5 and alternative specifications in Section 4.6. Finally, Section 4.7 concludes this chapter.

4.2   Data and Methodology

4.2.1   Data

The main dependent variable used in the empirical models of this chapter is the log non-domestic violence per million people, with data taken from the NVMS. This include all types of violence, including crime, but not domestic violence (e.g., spousal abuse in a household). Other measures of violence are used in robustness checks, including the number of violent incidents. This study used the latest available year (2014) of the NVMS for two reasons: (i) the latest data for the main independent variable in this analysis—cultural diversity—was only available in 2010 and (ii) until this year, not all provinces were covered by NVMS (see Table A.2 in the appendix). It is important to note that there were no local government elections in 2014, which may have affected violence at the district level.

Several economic and development variables found to be important in past studies were included in the models such as district GDP per capita, income inequality, unemployment rate and whether a district was classified as urban. A number of institutional variables were also included in robustness checks. The definition and sources of these variables can be found in Table A.3 in the appendix.

The main independent variable of interest (cultural diversity) that proxied ethnic grievances was the Greenberg-Gini index (ethnolinguistic fractionalisation weighted by

inter-group distance d_{mn}) (Esteban & Ray, 2011):

$$G_i = \sum_{m=1}^{N} \sum_{n=1}^{N} s_{mi} s_{ni} d_{mn}.$$

where s_{mi} and s_{ni} are the share of ethnolinguistic group m and n, respectively, in region i. N number of ethnolinguistic groups were included in the construction of G_i that corresponds to all existing ethnolinguistic groups captured in the 2010 population census. G_i takes a positive value equal to or smaller than 1, where a higher score of G_i means a more divided society along different ethnolinguistic groups.

Accounting for linguistic distance is important, given Indonesia's rich cultural diversity, although this might be overestimated, as most of the population are speaking similar Austronesian languages (204.6 million people or 96 per cent of the population).[1] In particular, three major subgroups account for 83 per cent of Austronesian languages family in Indonesia (Minnesota Population Center, 2015; Simons & Fennig, 2017): Javanese (71.3 million), Malayo-Chamic (65.6 million) and Sundanese (32.3 million). Most Javanese and Sundanese speakers live in Java, while most Malayo-Chamic speakers live in Sumatra.

To control for similarities between the ethnic groups, the Greenberg-Gini index, G_i, is weighted by linguistic distance. To achieve this, it is necessary to determine the linguistic similarity, κ (defined as the ratio between the number of common branches and its maximum possible number) and then construct $d_{mn} = 1 - \kappa^{\delta}$, where $\delta > 0$. Linguistic distance is measured as $d_{mn} = 1 - (\text{common}/13)^{0.05}$, where *common* is the number of shared linguistic classification branches between ethnolinguistic group m and n, while 13 is the maximum number of branches from Ethnologue Indonesia.

In this study, the choice of $\delta = 0.05$ was motivated by previous research. Desmet, Ortuño-Ortín, and Weber (2009) used this value in the main analysis and found similar results when δ was varied between 0.04 and 0.10; similarly with Esteban et al. (2012) that found the relatively flat pseudo-likelihoods for δ between 0.05 and 0.70.

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[1]The Austronesian languages family is not exclusive to Indonesia. The total number of its speakers is around 20 per cent of the world population (approximately 1.5 billion people).

Ethnolinguistic fractionalisation was preferred over measures of ethnicity, since language is considered an appropriate proxy for ethnicity in Indonesia (Mancini, 2008) and because it is possible to estimate linguistic distance from the Ethnologue data (Simons & Fennig, 2017). Ethnolinguistic groupings were based on language spoken at home from the 2010 census, which was matched with linguistic distance calculated from Ethnologue. Therefore, the value of G was assumed to be time invariant (or close to time invariant) and unchanged in 2014.[2]

It should be noted that there are different ways of incorporating linguistic similarities other than the one explained above. For example, Gershman and Rivera (2018) estimated the ethnolinguistic fractionalisation index at different aggregation levels, $ELF(k)$, in Africa. So $ELF(1)$ refers to the level of diversity at the most aggregated level, which only used six major language families in its construction. At the most disaggregated level, where each language is distinct, $ELF(13)$ is effectively the same as the standard ethnolinguistic fractionalisation index (F) that measured the probability of two individuals coming from different ethnolinguistic groups. Most importantly, their study's main finding supports the inclusion of ethnolinguistic similarities in the calculation of the distribution indices when estimating cultural diversity at subnational level.

As noted in the previous chapter, different distributional measures may explain group conflicts differently. Therefore, various measures of cultural diversity were employed in robustness checks. The Greenberg-Gini index, G, becomes the standard ethnolinguistic fractionalisation index F, when d_{mn} is dropped.[3] An alternative measure, the ethnic fractionalisation index (EFI), was based on the F formula, except that it used ethnicity instead of ethnolinguistic group. These proxies for cultural identities were different, as the former captured an individual's preference of ethnic group, while the latter was based on language. Although F was similar to G—both used ethnolinguistic groups—the latter also accounted for linguistic differences. Therefore, EFI had two degrees of separation with G.

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[2]Unless necessary, subscript i is dropped from this point onwards.

[3]This abbreviation for ethnolinguistic fractionalisation index, F, was preferred to ELF as the latter was often associated with the index constructed based on the ANM dataset.

Another important measure of cultural diversity is the ethnolinguistic polarisation index (Esteban & Ray, 2011):

$$P_i = \sum_{m=1}^{N} \sum_{n=1}^{N} s_{mi}^2 s_{ni} d_{mn}.$$

Unlike fractionalisation that measures the probability of two individuals coming from different groups, polarisation measures how polarised a society is. Group size matters in P in determining the probability of two individuals coming from different groups. Without d_{mn}, this variable (Po) becomes the equivalent of the ethnic polarisation index ($EPOI$), where groups are defined based on their preferred (stated) ethnicity. Since the difference between Po and F is in the squared s_{mi}, there will be an inverted-U relationship between these variables. This is the same for EFI and $EPOI$. Table 4.1 displays the various measures of cultural diversity, along with their characteristics.

There are a huge number of possible language pairs for the case of Indonesia (266,815 pairs from 731 languages) and the number was still very large (48,704 pairs) after the data were merged with the 2010 population census data.[4] For comparison, the number of language pairs was just 2,678 for 160 countries in Fearon (2003). Recall also that Fearon groups are constructed out of the necessity for cross-country comparisons, which was not the case in this study. The census data were taken from IPUMS-International, which collects census and survey data from around the world (Minnesota Population Center, 2015). Their version of the 2010 population census was sampled (geographically stratified and systematic) from the original data with an expansion factor of 10.

Distributional indices (i.e., fractionalisation and polarisation) were utilised in place of other proxies for grievances because there has been an established economic theory on how they are associated with conflict (Esteban & Ray, 2011). They are also commonly used in the literature, although these studies were mostly lacking in controlling for linguistic similarities in the construction of the indices (which is overcame in this study by the use of linguistic distance). However, to complement the analysis, another proxy for

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[4]The reduction in the number of pairs is due to the sampling of the census data that is likely to exclude minority groups.

Table 4.1: Measures of cultural diversity

Name	Acronym	Grouping	Types of distribution	Account for linguistic distance?
Greenberg-Gini index	G	Ethnolinguistic	Fractionalisation	Yes
Ethnolinguistic fractionalisation	F	Ethnolinguistic	Fractionalisation	No
Ethnolinguistic polarisation (with d_{mn})	P	Ethnolinguistic	Polarisation	Yes
Ethnolinguistic polarisation (without d_{mn})	Po	Ethnolinguistic	Polarisation	No
Ethnic fractionalisation index	EFI	Ethnic	Fractionalisation	No
Ethnic polarisation index	$EPOI$	Ethnic	Polarisation	No

ethnic grievances (relative deprivation) is included in the robustness checks.

Lastly, trust can be lower in heterogeneous societies (Alesina & La Ferrara, 2002) and it might be that higher levels of trust are associated with lower violence in Indonesia. Trust was measured using the 2014 Statistics of Social Capital, which asked 75,000 households about their levels of trust and tolerance. Specifically, the respondents were asked whether they trusted (on a scale of four, from 1 = not trustful to 4 = very trustful) their neighbours, village figures, religious figures and village apparatus. The trust index used in the regressions was constructed based on the mean response to these questions. Figure B.1 in the appendix provides a scatter plot of the trust index with violence intensity. There was a negative correlation ($r = -0.19$), indicating that lower trust is associated with a higher intensity of violence on average. It is understood that trust might be affected by violence, hence the endogeneity issue. Nevertheless, its inclusion was simply as a control and it is not the main variable of interest in this study.

4.2.2 Methodology

The models were first estimated using ordinary least squares. However, instrumental variable regressions were also used because of the potential endogeneity of cultural diversity, as discussed further below. The general specification was:

$$\ln(\text{non-domestic violence intensity}) = \beta_1 G + \beta_2 G^2 + \beta_3 \mathbf{X} + \alpha + u. \quad (4.1)$$

G was used as the preferred measure of cultural diversity, while other measures were

Table 4.2: Pairwise correlation matrix

	G	F	P	Po	EFI	$EPOI$
G	1.0000					
F	0.3918	1.0000				
P	0.9473	0.2570	1.0000			
Po	0.3850	0.8363	0.3604	1.0000		
EFI	0.4305	0.7360	0.3300	0.6136	1.0000	
$EPOI$	0.2042	0.6650	0.1746	0.7520	0.6959	1.0000

Source: Calculated from population census and Ethnologue.

used in robustness checks. This contrasts the approach of Esteban and Ray (2011), who included all measures of cultural diversity in the same model, on the assumption that they simultaneously capture an individual's propensity for violent conflict. However, the various measures of cultural diversity were highly correlated—particularly between the G and P with the coefficient of correlation, $r = 0.9473$—which would introduce a collinearity problem into the empirical estimations (see Table 4.2 for pairwise correlations of these variables). Their model also focused on factors explaining conflict, particularly civil wars, rather than general violence that might not necessarily be driven by conflict. Nonetheless, another specification based on the Esteban-Ray conflict model was also tested in Section 4.6.2. In addition, the literature has shown that the effect of cultural diversity might not be monotonic; therefore, the squared value of G was included in Equation 4.1.

G, the preferred measure of cultural diversity, was used as a proxy for ethnic grievances, yet there were reasons to believe that the variable was endogenous—for example, the effect of the transmigration program on regions' ethnic composition and violence. Therefore, this study also aimed to carefully test the role of cultural diversity in explaining violence by mitigating, not removing, the potential issue of endogeneity.

This study used the out-of-Taiwan theory to construct an instrument for G. The theory is the mainstream hypothesis on the origin of Austronesian-speaking people, who are thought to have come from Taiwan and arrived in the Philippines around 2500 BC, before spreading to Sulawesi (1600 BC) and Borneo-Maluku-Timor-Papua (1500 BC) (Bellwood & Dizon, 2008; Bellwood, Fox, & Tryon, 1995). Luzon in the north of the Philippines was the intermediate point for the journey. The migration to Java and Sumatra was

presumably around 1500 to 1000 BC, as the expansion to mainland Southeast Asia only began from 500 BC (Spriggs, 2010). However, the dispersal did not stop in Indonesia, and settlers arrived in New Zealand around 1200 AD (see Appendix B, Figure B.2). The theory is not only supported by archaeological findings—such as radiocarbon dating—but also by comparative linguistics and biological anthropology. For example, linguists note innovations in terms of phonological mergers and pronoun forms among languages spoken outside Taiwan (extra-Formosan or Malayo-Polynesian languages, such as Javanese and Malay) (Bellwood, Chambers, Ross, & Hung, 2011; Blust, 1993).

Such dispersal from Taiwan might be correlated with ethnic diversity in regions inhibited by Austronesian-speaking people. This conjecture is motivated by the out-of-Africa hypothesis (Ramachandran et al., 2005), which indicates that the migratory distance from Addis Ababa in Ethiopia—thought to be the origin of the human species—is negatively correlated with genetic diversity. Unsurprisingly, the distance from Addis Ababa also negatively predicts ethnic diversity (Michalopoulos, 2012). Such negative association between the distance from East Africa and genetic/ethnic diversity is attributed to the limited genetic variation brought by early human migrants. Therefore, this study hypothesised that distance from Taiwan is also negatively correlated with cultural diversity in Indonesian districts.

Between endpoints (Taiwan and each district in Indonesia), the distance was measured as the sum of the distance from Taiwan to the central Philippines (intermediate waypoint) and from the central Philippines to the centroid of the respective district. Distance was measured using QGIS software, while country maps and administrative boundaries were taken from GADM (2018). Additionally, the distance from Addis Ababa in East Africa was calculated using Cairo (Egypt) and Phnom Penh (Cambodia) as the intermediate waypoints before reaching each district in Indonesia. In addition to the distance from Taiwan and distance from Addis Ababa, geographic variabilities—mean elevation, absolute latitude (distance from equator) and area—could also explain cultural diversity (Michalopoulos, 2012). Theoretically, such variables should have no direct effect on violence, thus meeting the exclusion restriction requirement.

Therefore, the reduced form (first stage regression in two-stage least squares [2SLS] estimations) is given by:

$$G = \gamma_0 + \gamma_1 \mathbf{Z} + \gamma_2 \mathbf{X} + v, \tag{4.2}$$

where $\mathbf{Z}$ is a set of instruments that include distance from Taiwan, absolute latitude, an interaction between absolute latitude and distance from Taiwan, mean elevation and area. Given that the structural model (Equation 4.1) included a quadratic form for G, the squared form of these variables (except for the interaction term) was added as additional instruments for G^2 in Equation 4.2. Finally, $\mathbf{X}$ is a vector of other explanatory variables. All regressions used heteroskedasticity-robust standard errors to ensure valid inference, yet clustering (at provincial level) and bootstrapping were used as additional checks.

4.3   Patterns of Violence and Cultural Diversity

This section summarises the two main variables under consideration—violence and cultural diversity—as well as descriptive statistics for the other variables used in the analysis (Table 4.3).

Table 4.3: Descriptive statistics

Variable	Obs.	Mean	Std dev.	Min.	Max.
Log non-domestic violence intensity	495	4.29	1.11	0.00	7.84
Log non-domestic collective violence intensity	495	1.49	1.23	0.00	4.47
Log non-domestic violence (with casualties) intensity	495	1.10	2.70	-4.61	5.34
Number of non-domestic violent incidents	495	52	106	0	1,211
Number of people killed in violent conflict	495	1	3	0	37
Greenberg-Gini index ($\delta = 0.05$)	495	0.09	0.12	0.00	0.66
Greenberg-Gini index ($\delta = 0.5$)	495	0.24	0.17	0.00	0.70
Ethnolinguistic fractionalisation index	495	0.39	0.26	0.00	0.88
Ethnolinguistic polarisation index ($\delta = 0.05$)	495	0.03	0.04	0.00	0.24
Ethnolinguistic polarisation index	495	0.13	0.07	0.00	0.25
Religious fractionalisation	495	0.18	0.19	0.00	0.70
Ethnic fractionalisation index	495	0.45	0.31	0.01	0.94
Ethnic polarisation index	495	0.44	0.25	0.01	0.94
Greenberg-Gini index ($\delta = 0.05$)/population	495	0.81	2.39	0.00	28.73
Trust index	495	2.82	0.12	2.17	3.16
Gini ratio for income inequality	495	0.32	0.05	0.21	0.52
Human Development Index (HDI)	495	66.67	6.89	25.38	83.78
Unemployment rate	495	0.05	0.03	0.00	0.19
Log district real GDP per capita	495	1.95	0.70	0.28	4.98
Urban district	495	0.31	0.46	0	1
Share of Javanese outside Java	495	0.10	0.16	0.00	0.85
Relative deprivation in income-welfare gap	495	-64.94	12.33	-91.27	22.74
Number of worship places	495	1,792	2,666	36	19,253
Dummy for new district	495	0.41	0.49	0	1
Total government revenue (billion IDR)	489	1,216	815	373	6,459
Poverty rate	495	0.13	0.78	0.17	0.44
Distance from Taiwan (km)	495	3,498	440	2,202	4,546
Distance from Africa (Addis Ababa; km)	495	12,415	740	11,205	14,678
Mean elevation	495	0.34	0.38	0.00	3.07
Variation in elevation	495	0.25	0.21	0.00	1.26
Absolute latitude	495	0.47	0.30	0.00	1.19
Area ('000 km^2)	495	3.73	5.65	0.01	44.07

4.3.1 Patterns of Violence

Figure 4.1 displays the large geographical variations of different measures of violence. In all cases, the districts in Sumatra seem to stand out as experiencing greater intensities of violence. It is clear from the two top panels of the figure that, while the *number* of violent incidents in Java is larger than the rest of the country, the large population makes the *intensity* less prominent.

Nondomestic violence, 2014

Log nondomestic violence per million people, 2014

Log nondomestic collective violence per million people, 2014

Log nondomestic violence with casualties per million people, 2014
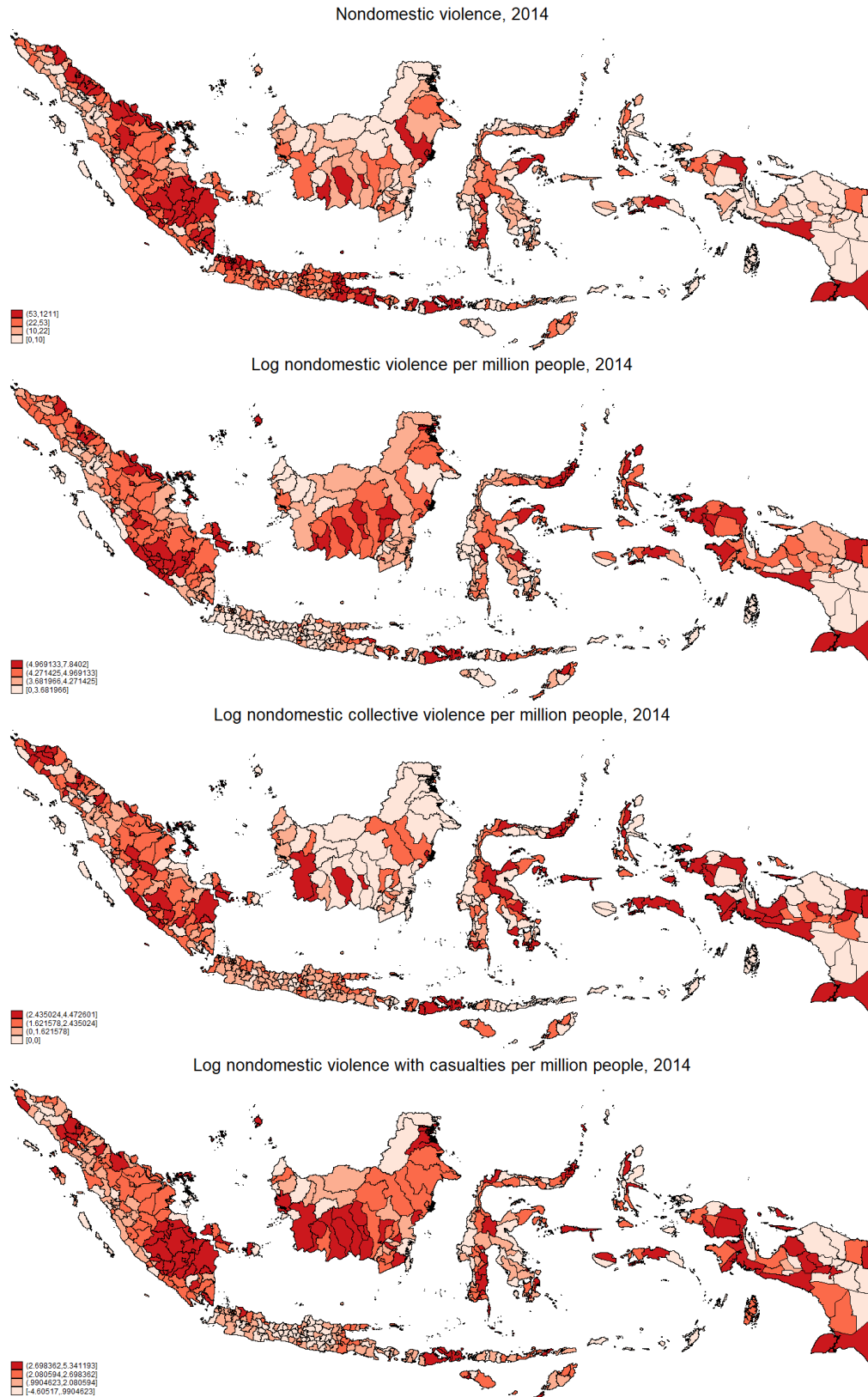
Figure 4.1: Distribution of violence by district in 2014

Source: Calculated from NVMS and population census.

Barron et al. (2016) noted the increase in collective violence in post-conflict regions, which is consistent with findings from other countries. The third panel in Figure 4.1 displays the distribution of collective violence—defined as violent incidents that involved at least 10 people–and the intensity of such violence in Javanese districts became more prominent than in the previous panel. Finally, districts in the south of Kalimantan and Sumatra stand out when casualties were accounted for (bottom panel).

4.3.2 Distribution and Variations of Cultural Diversity

Controlling for d_{mn} reduces the concentration of cultural diversity to certain regions (compare the first two panels of Figure 4.2). This visual observation is confirmed by examining mean d_{mn} for pairs of languages within a region (see Table A.4 in the appendix). Papua has the largest number of relatively distinct languages, as indicated by the mean $d_{mn} = 0.815$ (out of a maximum of 1). At another extreme, Kalimantan only has about one-third of the number of local languages compared to Papua, but its average d_{mn} (0.078) is 10 times smaller than Papua. This indicates the relative similarity of languages spoken by people in Kalimantan. Consequently, the Greenberg-Gini index G for Papua is much larger than for Kalimantan.

In another example, there are only eight local languages in Java-Bali, but their d_{mn}, on average, is roughly the same as the local languages in Maluku. Given that the mean of the G in Java-Bali is very small relative to Maluku, it can be inferred that there must be a few local languages that are highly dominant in Java-Bali relative to the dominant local languages in Maluku.

In Figure 4.3, the inclusion of linguistic distance d_{mn} reduces the degree and distribution of cultural diversity by comparing measures that account (G and P) or do not account (F and Po) for d_{mn}. Measures that do not account for d_{mn} have fat tails, which suggest the presence of very heterogeneous districts.

Ethnolinguistic fractionalisation index, 2010

Greenberg-Gini index (d=0.05), 2010

Ethnolinguistic polarisation index, 2010
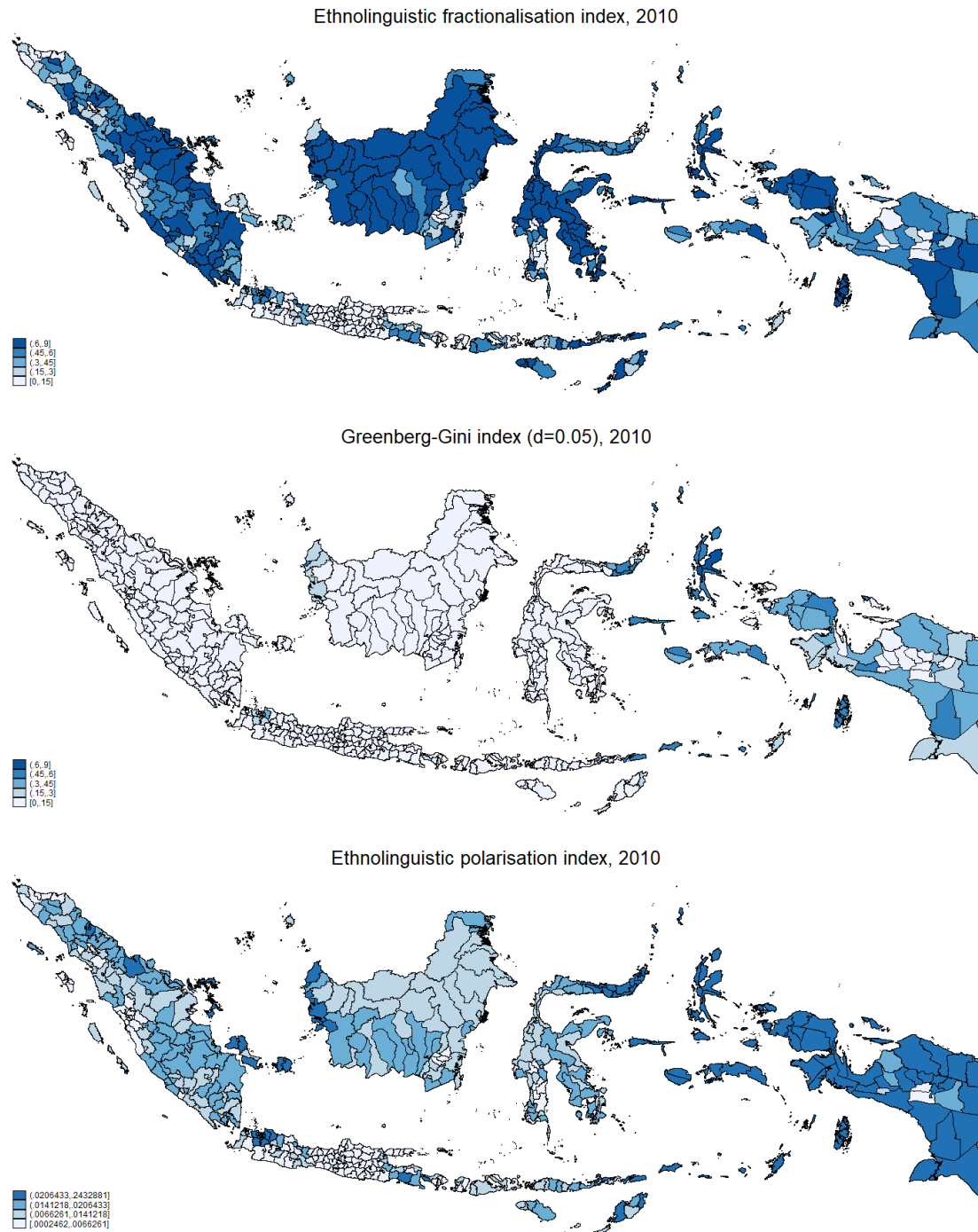
Figure 4.2: Various measures of cultural diversity in 2010

Source: Calculated from population census and Ethnologue.
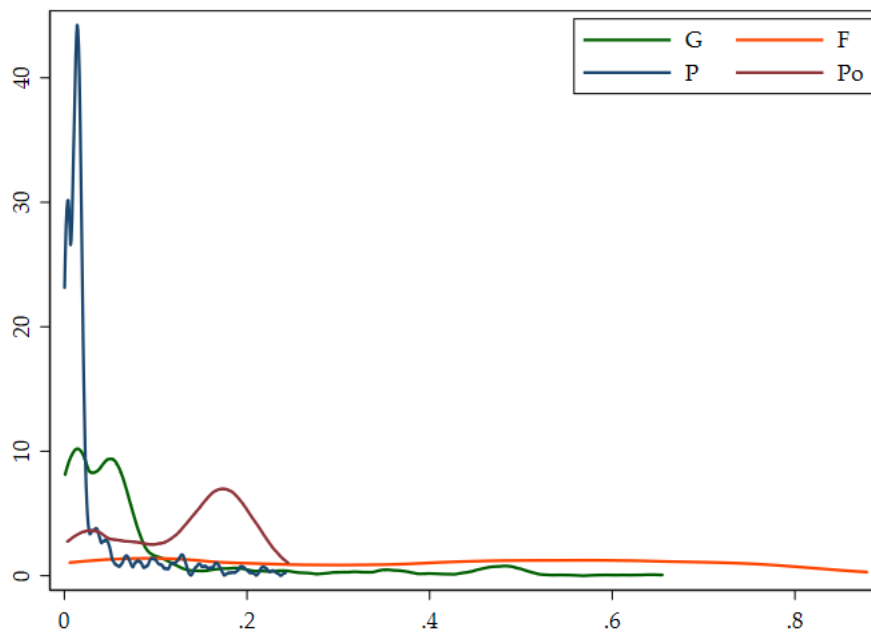
Figure 4.3: Kernel density of cultural diversity variables

Source: Calculated from census 2010 and Ethnologue.

4.4   Regression Results

Cultural diversity, as measured by G, displayed no strong linear association with the intensity of violence (Table 4.4 Model 1). However, it did have a non-linear association— a finding that remained after controlling for various covariates (Models 2 and 3). At low levels of fractionalisation, a higher degree of cultural diversity tended to be associated with higher intensity of violence. However, once its level reached a turning point, violence intensity decreased with cultural diversity. Taking the coefficients from Model 3 suggested that higher levels of cultural diversity were associated with more violent incidents, up to a point where the diversity index had a score of 0.26. Beyond this threshold, the relationship between the two variables became negative. Most districts (447 districts, 90 per cent of all districts) had a level of diversity below this threshold, where higher levels of diversity were associated with higher levels of violence (top panel of Figure 4.4).

Table 4.4: Main regression results (dependent variable: log nondomestic violence per million people)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	OLS	OLS	2SLS	2SLS	2SLS	2SLS
G	0.241	4.754***	4.614***	12.75	33.40	23.75**	17.67***
	(0.547)	(1.597)	(1.511)	(14.61)	(26.17)	(10.30)	(4.931)
G^2		-9.596***	-7.847**	-18.82	-59.50	-44.29*	-31.75***
		(3.373)	(3.097)	(32.96)	(67.15)	(25.35)	(11.01)
Trust index			-0.836*	-0.189	0.673	0.0389	-0.180
			(0.468)	(0.572)	(0.805)	(0.626)	(0.556)
Gini ratio income ineq.			1.605	0.0142	-3.163	-1.422	-0.525
			(1.020)	(2.047)	(3.243)	(1.749)	(1.251)
HDI			0.0638***	0.0893***	0.126***	0.100***	0.0907***
			(0.0121)	(0.0227)	(0.0266)	(0.0187)	(0.0158)
Unemployment rate			-0.941	-3.157	-4.599	-2.684	-2.445
			(1.996)	(2.520)	(4.189)	(2.461)	(1.941)
Log GDP p.c.			0.0314	-0.0338	-0.290	-0.197	-0.118
			(0.0906)	(0.235)	(0.444)	(0.192)	(0.131)
Urban district			-0.00565	-0.00227	-0.0817	-0.0706	-0.0434
			(0.133)	(0.159)	(0.256)	(0.160)	(0.157)
Constant	4.267***	4.101***	1.649	-1.564	-5.619*	-2.507	-1.496
	(0.0577)	(0.0741)	(1.497)	(2.211)	(2.917)	(2.060)	(1.784)
Observations	495	495	495	495	495	495	495
Instruments				DT, DT^2	Lat, Lat^2	$DT, DT^2,$ $Lat, Lat^2,$ $DT \times Lat$	$DT, DT^2,$ $Lat, Lat^2,$ $DT \times Lat,$ DA, DA^2
Endogeneity test p-value				0.200	0.0000322	0.000109	0.0000887
Weak identification test				2.031	0.649	2.808	5.104
Hansen J stat. p-value						0.302	0.264

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. Instruments: $DT =$ distance from Taiwan (km); $DT^2 =$ squared distance from Taiwan; $Lat =$ absolute latitude ('000 km); $Lat^2 =$ squared absolute latitude; $DA =$ distance from Africa (km); $DA^2 =$ squared distance from Africa. Weak identification test was based on the Kleibergen-Paap Wald rank F statistic. The endogeneity test was a variation of the Wu-Hausman test (Baum, Schaffer, & Stillman, 2003).
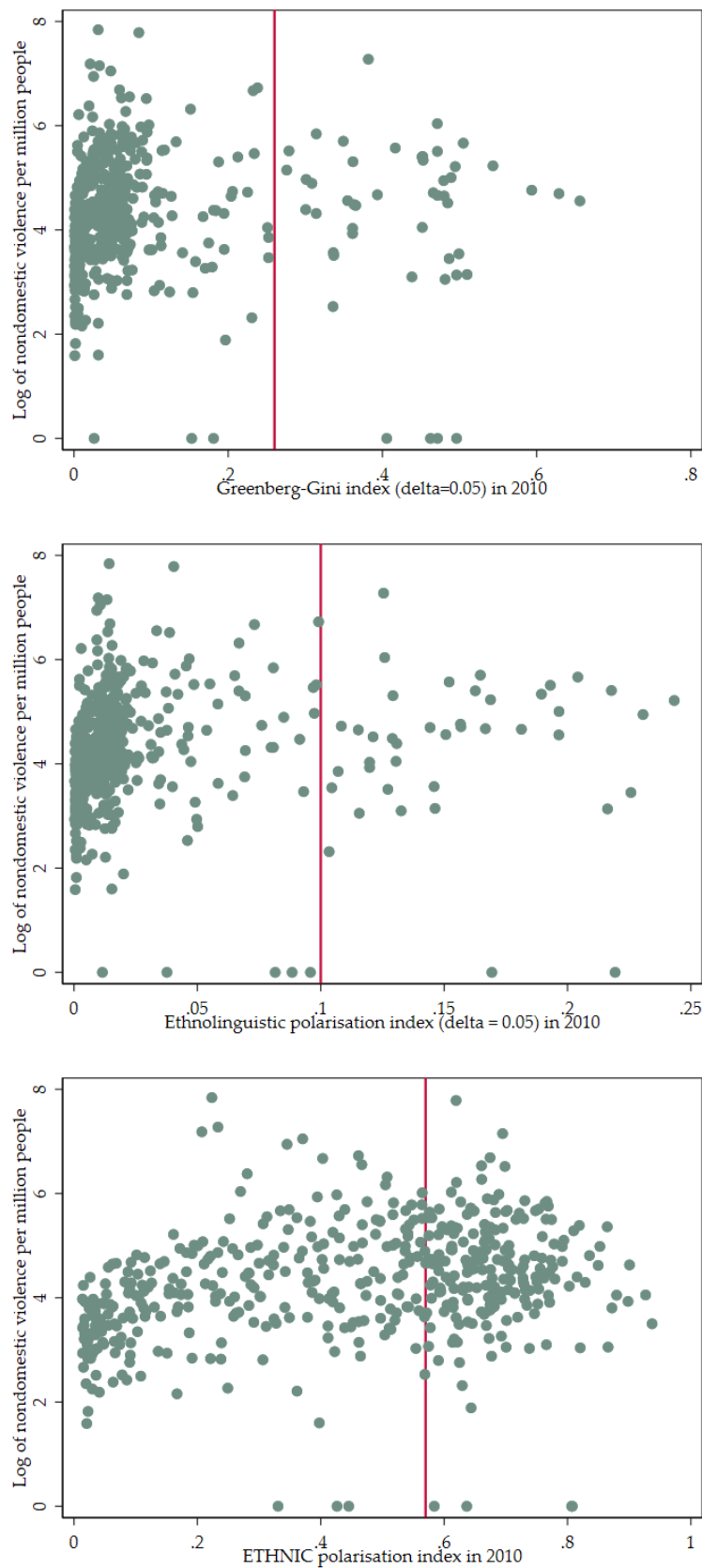
Figure 4.4: Scatterplots of violence and measures of cultural diversity

Notes: Vertical lines cross at the turning points estimated from Model 3 in Table 4.4 (G) and Models 3 (P) and 7 ($EPOI$) in Table 4.6.

Neither clustering the standard errors at provincial level nor bootstrapping with 1,000 repetitions changed this key result. The finding also held when using 2010 violence data to match the year of the census used in the construction of the cultural diversity variable (results not shown).[5] Nevertheless, the non-monotonic correlation between G and violence intensity was absent once regional fixed effects were included. This is discussed further in the next section.

The estimated parameter for per capita real GDP was insignificant, while the non-linear result remained unchanged. When levels of GDP was used instead of per capita GDP, districts with lower GDP tended to experience higher levels of violence intensity (results not shown). Trust was statistically significantly and negatively associated with the intensity of violence in Model 3, yet lost its significance in subsequent models. However, the use of standardised beta coefficients showed stronger effects of G than GDP or trust (results not shown). Interestingly, districts with higher HDI scores tended to experience greater intensity of violence. As shown later in the chapter using robustness checks, the relationship between the HDI and violence was more complex than what these coefficients suggested in these regressions. Other control variables—including the Gini ratio for income inequality, the unemployment rate and whether a district was urban—generally appeared unimportant to the intensity of violence in Indonesia.

Before proceeding to instrumental variable regression models, a statistical test was conducted to estimate the severity of omitting variables in the regression (Oster, 2019). In Model 3, the estimated degree of selection for G was -0.87, which means that the unobservables need to be 0.87 times as important as the observables to produce zero treatment effects (the negative sign denotes the unobservables have to be negatively associated with G). This estimate suggests the relatively less severe bias from omitting important variables in the regression.

Instrumenting G and G^2 generally did not affect the non-linearity findings. Distance from Taiwan (DT) negatively predicted G in the first-stage regression of Model 4, but the estimated parameter was not significant (results from the first-stage regressions can

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[5]However, the 2010 regression was limited by the absence of the trust index, since it was only available in 2014.

be found in Appendix A, Table A.5). However, the model did not pass the endogeneity test, implying that we could reject the null of an exogenous G.[6] By itself, this implied the sufficiency of the ordinary least squares (OLS) estimations. When absolute latitude (Lat) was used to replace DT in Model 5, the variable negatively and significantly predicted cultural diversity, similar to the findings in Michalopoulos (2012). Model 6 combined DT and Lat, and the interaction strongly predicted G.

Finally, Model 7 augmented Model 6 with distance from Africa DA and DA^2, which resulted in an increase in the Kleibergen-Paap Wald rank F statistic that signalled stronger instruments overall.[7] Relative to Model 3, the estimated coefficients for G and G^2 jumped significantly.

4.5 Robustness Checks

This section assesses whether the results presented above were robust to regional variations, alternative measures of cultural diversity, additional covariates and alternative measures of violence. In addition, since the 2SLS models yielded similar results to OLS, robustness tests were based on changes to Model 3.

4.5.1 Regional Variations

Column 1 in Table 4.5 indicates that, on average, the intensity of violence was higher outside Java and Bali. Another important observation was the absence of statistical significance of cultural diversity across regions, except for Sumatra. Overall, income inequality seemed to be an important factor (Column 2), particularly in regions outside Java-Bali and Sulawesi (Columns 3 to 7).

The effect of cultural diversity was no longer prominent once regional fixed effects were accounted for. Different shapes of non-linear association were observed in different regions, which rendered the estimated parameters for G and G^2 insignificant in the most

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[6]The test was a variation of the Wu-Hausman test (Baum et al., 2003).

[7]Other instruments, such as mean elevation and area, were not a good predictor of G, as shown by the insignificant parameters of these variables and the drops in the weak identification test statistic (results not shown).

comprehensive model (Column 2). The parameters for G and G^2 varied across regions where the inverted-U association seemed to be driven by districts and municipalities in Sumatra (Column 7). This correlation was also observed in Java-Bali and Sulawesi, although it was not statistically significant.

Table 4.5: Regional variations (dependent variable: log nondomestic violence per million people)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All	All	Eastern	Kalimantan	Java-Bali	Sulawesi	Sumatra
G	3.042*	0.624	-1.916	-1.833	0.797	4.129	12.95***
	(1.582)	(1.347)	(2.171)	(2.939)	(5.317)	(3.744)	(3.680)
G^2	-6.178*	-1.718	3.338	0.378	-10.81	-8.125	-49.25***
	(3.215)	(2.655)	(3.694)	(5.598)	(11.73)	(7.875)	(17.01)
Trust index		-0.127	-0.569	0.243	-2.194	0.250	0.272
		(0.442)	(0.758)	(1.210)	(1.658)	(1.694)	(0.686)
Gini ratio income ineq.		2.385**	5.819**	5.041*	-0.993	-3.092	6.871***
		(1.098)	(2.923)	(3.000)	(2.242)	(2.141)	(1.616)
HDI		0.0790***	0.0903***	0.101**	0.0576***	0.0481	0.0694**
		(0.0114)	(0.0217)	(0.0383)	(0.0201)	(0.0396)	(0.0310)
Unemployment rate		-0.838	-1.502	-1.811	-6.620**	13.68**	1.913
		(1.923)	(5.198)	(4.922)	(3.110)	(6.645)	(2.077)
Log GDP p.c.		0.0832	0.0885	-0.108	0.160	0.0683	-0.0971
		(0.0818)	(0.168)	(0.217)	(0.184)	(0.243)	(0.145)
Urban district		0.160	0.682**	0.418	0.00538	0.585	-0.113
		(0.119)	(0.270)	(0.390)	(0.220)	(0.568)	(0.185)
Sumatra	0.870***	1.156***					
	(0.116)	(0.115)					
Sulawesi	0.622***	0.877***					
	(0.154)	(0.143)					
Kalimantan	0.559***	0.855***					
	(0.157)	(0.143)					
Eastern	0.455**	1.432***					
	(0.201)	(0.191)					
Constant	3.669***	-2.417	-1.525	-4.284	6.357	0.626	-3.200
	(0.0820)	(1.486)	(2.314)	(4.496)	(4.533)	(5.438)	(3.441)
Observations	495	495	90	55	127	73	150
R^2	0.110	0.386	0.467	0.536	0.350	0.416	0.360

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. Eastern region comprises Nusa Tenggara, Maluku and Papua islands. Region was relative to Java-Bali in (1) and (2). OLS was used in the regressions. Using province rather than island fixed effects in (1) and (2) yielded similar results.

4.5.2 Alternative Measures of Cultural Diversity

Using various measures of cultural diversity did not alter the main results. The choice of $\delta = 0.05$ could exacerbate the problem of overcounting language in Ethnologue (Hammarström,

2015), as smaller δ would place more emphasis on small differences in languages. However, Model 1 in Table 4.6 used $\delta = 0.5$ in the calculation of G, which resulted in similar estimated coefficients for G and G^2.

Ignoring linguistic distance altogether in F (Model 2), as well as using ethnicity as ethnic grouping (Model 6), also did not change the non-linear relationship. When religious fractionalisation (Model 5) was used, the variable was positively associated with the intensity of violence.

All polarisation indices (Models 3, 4 and 7) yielded qualitatively similar results, where the relationship with the intensity of violence was non-linear. Similar to previous results, the majority of districts (92 per cent) were in the increasing region of the inverted-U shape (with $P < 0.10$ as the turning point; see second panel of Figure 4.4 above). When $EPOI$ was used, the share became significantly lower (58 per cent of districts with $EPOI$ less than the value of the turning point of 0.57; bottom panel).

Table 4.6: Alternative measures of cultural diversity (dependent variable: log nondomestic violence per million people)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
G ($\delta = 0.5$)	5.332***						
	(0.898)						
G^2 ($\delta = 0.5$)	-7.905***						
	(1.867)						
F		3.822***					
		(0.615)					
F^2		-3.836***					
		(0.776)					
P			12.11**				
			(4.748)				
P^2			-52.06*				
			(27.24)				
Po				12.38***			
				(2.339)			
Po^2				-38.46***			
				(10.34)			
Relig. fractionalisation					2.205***		
					(0.847)		
Squared relig. fract.					-2.274		
					(1.607)		
EFI						2.283***	
						(0.528)	
EFI^2						-1.195*	
						(0.630)	
$EPOI$							4.092***
							(0.635)
$EPOI^2$							-3.655***
							(0.786)
Trust index	-0.894**	-0.780*	-0.824*	-0.789*	-0.798*	-0.539	-0.575
	(0.436)	(0.429)	(0.477)	(0.438)	(0.436)	(0.465)	(0.467)
Gini ratio income ineq.	1.553	1.634*	1.781*	1.595*	1.990**	1.416	1.578*
	(0.970)	(0.961)	(1.032)	(0.952)	(0.926)	(0.934)	(0.921)
HDI	0.0569***	0.0585***	0.0627***	0.0596***	0.0548***	0.0641***	0.0607***
	(0.0113)	(0.0116)	(0.0117)	(0.0116)	(0.0112)	(0.0118)	(0.0114)
Unemployment rate	0.133	-0.459	-1.421	-0.292	0.173	-1.708	-1.039
	(1.853)	(2.032)	(2.076)	(2.051)	(1.938)	(1.975)	(2.031)
Log GDP p.c.	-0.00744	0.0155	0.0527	-0.00884	0.0377	-0.0979	-0.0421
	(0.0899)	(0.0886)	(0.0901)	(0.0881)	(0.0876)	(0.0905)	(0.0907)
Urban district	0.0520	0.0246	-0.0238	0.0582	0.000779	0.110	0.0549
	(0.130)	(0.134)	(0.131)	(0.131)	(0.130)	(0.134)	(0.133)
Constant	1.901	1.399	1.633	1.270	1.911	0.656	0.612
	(1.329)	(1.343)	(1.521)	(1.387)	(1.433)	(1.457)	(1.475)
Observations	495	495	495	495	495	495	495
R-squared	0.271	0.271	0.224	0.271	0.229	0.310	0.288

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. OLS was used in the regressions.

4.5.3 Additional Covariates

It can be argued that the control variables were insufficient to capture economic motives or grievances. Table 4.7 indicates that the non-monotonic result remained when more covariates were added to the regressions. By itself, G could be unable to fully capture group grievance and, to overcome this, relative deprivation (RD) was included in the regression. The variable measured a district's relative deprivation in income and welfare, as proxied by per capita GDP and HDI, respectively.[8] The regression yielded a negative and significant coefficient of RD, while keeping the non-linearity result of G unchanged (Model 1). This implies that relatively poor districts with high human development tend to experience more violence.

Two sets of institutional variables were also included as additional covariates. In Model 2, a set of institutional variables related to the decentralisation that began in early 2000 (regarding district proliferation) and 2005 (regarding district head elections) were included in the regression. Pierskalla and Sacks (2017) found that violence was negatively associated with these two aspects of decentralisation, thereby suggesting that institutional change is important in abating violence. They also found that service provision positively affected violence.[9] However, Model 2 indicated that becoming a new district and the level of service provision had no effect on violence, while the parameter signs for G and G^2 were unchanged and still significant.[10] The estimated parameter for total government revenue was negative and significant, which suggests that larger fiscal capacity abates violence. It is likely that the limited number of observations in this regression could explain the difference in results, as Pierskalla and Sacks used NVMS data from 2001 to 2010, which included the period of extended communal violence during the transition era.

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[8]See Tadjoeddin (2013) for the construction of the variable.

[9]Service provision was calculated as a sum of standardised variables of net enrolment rates (primary and junior), access to safe water, access to safe sanitation and birth attended by a skilled health worker.

[10]The absence of district head elections in 2014 meant that the data could not be used to test this in the regression.

Table 4.7: Additional covariates (dependent variable: log nondomestic violence per capita)

	(1)	(2)	(3)	(4)	(5)	(6)
G	4.359***	4.291***	2.468*	4.605***	-0.852	3.461**
	(1.569)	(1.420)	(1.453)	(1.513)	(1.300)	(1.499)
G^2	-8.129**	-7.988***	-4.721	-7.830**	1.365	-6.033**
	(3.281)	(2.952)	(2.937)	(3.111)	(2.579)	(3.011)
Relative deprivation	-0.0227***					
	(0.00600)					
Service provision index		-0.0138				
		(0.0258)				
New district		0.0190				
		(0.0941)				
Log total government revenue		-0.527***				
		(0.0944)				
Number of worship place			-0.000124***			
			(1.72e-05)			
Poverty rate				0.175		
				(0.953)		
Lagged dep. var.					0.604***	
					(0.0723)	
Share of Javanese						-0.651***
						(0.118)
Trust index	-1.183**	-0.542	-0.592	-0.822*	0.0283	-0.739
	(0.472)	(0.407)	(0.471)	(0.493)	(0.516)	(0.474)
Gini ratio income ineq.	3.029***	1.385	1.365	1.593	0.726	1.012
	(1.016)	(0.984)	(0.999)	(1.035)	(0.819)	(1.028)
HDI		0.0697***	0.0619***	0.0651***	0.0171	0.0734***
		(0.0134)	(0.0112)	(0.0138)	(0.0122)	(0.0122)
Unemployment rate	1.849	0.104	1.119	-0.962	2.677	-1.610
	(2.056)	(2.040)	(2.062)	(1.971)	(1.710)	(1.990)
Log GDP p.c.		0.241***	0.0125	0.0345	0.00944	0.0347
		(0.0831)	(0.0877)	(0.0940)	(0.0668)	(0.0895)
Urban district	0.121	0.0843	-0.0226	-0.00835	0.128	0.0343
	(0.130)	(0.116)	(0.126)	(0.133)	(0.153)	(0.132)
Constant	3.272**	3.749**	1.432	1.496	0.173	1.168
	(1.360)	(1.590)	(1.472)	(1.833)	(1.563)	(1.513)
Observations	495	489	495	495	304	495
R^2	0.172	0.298	0.300	0.223	0.583	0.254

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. HDI and per capita GDP were dropped, as they were used to construct relative deprivation in (1). OLS was used in the regressions.

While formal institutions are important at the macro level, it is argued that informal institutions at the micro, grassroots level are also essential. In particular, studies have found a pacifying effect of religious institutions on violence (Barron et al., 2009; De Juan et al., 2015). The number of places of worship was included as a proxy for religious informal institutions and, consistent with previous studies, the effect was negative and significant (Model 3). In addition, the estimated parameters of G and G^2 still exhibited

the same signs, although at lower levels of significance.

Previous studies have found a positive correlation between poverty and violence (Barron et al., 2009; Pierskalla & Sacks, 2017; Tadjoeddin & Murshed, 2007). However, the inclusion of this variable seemed to have no effect on violence intensity (Model 4). The non-linear effect of G remained. Lagged violence intensity had a strong predictive power in Model 5, but at the cost of a smaller number of observations (see results in Section 4.6.2 as well). More importantly, its inclusion biased down the estimated coefficients of the other explanatory variables, particularly G. Models that took care of serial correlation—such as an OLS with Newey-West standard errors—could not be used because the data for G is only available for one year.

Finally, the non-monotonicity of G remained even after adding the share of ethnic Javanese—the proxy for the omitted variable that affects district's demographic composition and violence (Model 6). This finding is consistent with previous studies (Barron et al., 2009; Tajima, 2013), although these studies used 2003 and 2005 data—a period where the Aceh conflict was at its height and the country had just experienced large religious and ethnic conflicts in Maluku and Kalimantan.

4.5.4 Alternative Dependent Variables

The results were also robust to different measures of violence. Model 1 in Table 4.8 used the number of non-domestic *collective* violent incidents per million people as the dependent variable, and the non-linear effect of G remained. However, when violent incidents with casualties was used as the dependent variable (Model 2), the significance of both G and G^2 disappeared but the signs remained.

The inverted-U relationship was still observed when a negative binomial estimation method was used to estimate models with a number of different measures of violence, such as the number of non-domestic violence (Model 3), number of violent incidents (Model 4), number of people killed (Model 5) and number of violent conflicts (Model 6).[11] The

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[11]Negative binomial regression was preferred, since the outcome was a non-negative count of violent incident that was also over-dispersed. Re-estimating Models 1 to 3 of the main regressions with this method yielded similar results (appendix Table A.6).

Table 4.8: Alternative dependent variable

	(1)	(2)	(3)	(4)	(5)	(6)
	Log non-domestic collective violence per million people	Log non-domestic collective violence with casualties per million people	Number of non-domestic violence	Number of violence	Number of people killed	Number of violent conflict
G	4.934***	4.483	4.227***	4.164***	4.921***	3.974***
	(1.679)	(3.645)	(1.319)	(1.319)	(1.310)	(1.381)
G^2	-8.928**	-12.40	-7.346***	-7.312***	-8.535***	-5.675**
	(3.489)	(7.554)	(2.385)	(2.373)	(2.527)	(2.520)
Trust index	-0.859*	-2.027	-0.458	-0.398	-1.188***	-0.936**
	(0.466)	(1.325)	(0.382)	(0.381)	(0.411)	(0.409)
Gini ratio income ineq.	0.554	3.044	2.464**	2.555**	1.807**	1.673
	(1.100)	(2.390)	(1.015)	(1.013)	(0.863)	(1.096)
HDI	0.0499***	0.0714***	0.0692***	0.0713***	-0.00536	0.0447***
	(0.0112)	(0.0257)	(0.00986)	(0.00981)	(0.0113)	(0.0112)
Unemployment rate	4.175**	6.164	0.856	0.792	1.187	3.352**
	(1.814)	(4.187)	(1.629)	(1.625)	(1.475)	(1.582)
Log GRDP p.c.	-0.160	0.219	0.0540	0.0474	0.219***	-0.0648
	(0.0972)	(0.182)	(0.0793)	(0.0792)	(0.0805)	(0.0832)
Urban district	0.134	-0.714**	0.156	0.144	0.119	0.522***
	(0.139)	(0.318)	(0.114)	(0.113)	(0.123)	(0.125)
Log population			0.663***	0.656***	0.784***	0.722***
			(0.0539)	(0.0537)	(0.0466)	(0.0576)
Ln(alpha)			-0.469***	-0.478***	-0.738***	-0.323***
			(0.0684)	(0.0687)	(0.101)	(0.0766)
Constant	0.250	0.450	-9.408***	-9.547***	-6.104***	-8.243***
	(1.510)	(4.374)	(1.329)	(1.311)	(1.528)	(1.501)
Observations	495	495	495	495	495	495
R^2	0.145	0.094				

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. OLS was used in (1) and (2), while negative binomial regression was used in (3) to (6).

last regression suggests that, at least in the 2014 data, the effect of cultural diversity was not limited to general violence, but also extended to violent conflict.

4.6   Alternative Specifications

This section tests the robustness of the results to a few changes in the model specification. First, under the assumption that cultural diversity does not change in the short term, panel regression models were used to exploit the longitudinal nature of the NVMS. Second, this study employed an empirical model based on the Esteban-Ray theory of conflict.

4.6.1   Panel Data Regressions

The NVMS is known for its longitudinal data, which span for more than a decade. To take advantage of this facet, the regressions in Table 4.9 employed a random-effects model by assuming that the value of G was unchanged during 2005 to 2014. The year 2005 was selected as the cut-off because it is considered the start of the era where large, episodic violence were largely subsided.

The results indicated that the non-linear association between cultural diversity and violence intensity held even after controlling for province fixed effects (Models 1 to 3). Again, the exception was when a lagged dependent variable was included as an additional control (Model 4). Even so, the signs of the coefficients remained the same. The last three models employed a two-stage least-squares method, where the non-monotonic finding was still observed in general.[12]

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[12]These models used the same instruments as in Table 4.4, Model 7.

Table 4.9: Panel regressions, 2005-2014 (dependent variable: log nondomestic violence per million people)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	RE	RE	RE	RE	RE-IV	RE-IV	RE-IV
G	5.170***	4.821***	3.850***	0.650	12.08***	25.83**	18.54***
	(1.483)	(1.285)	(1.479)	(0.610)	(4.226)	(10.06)	(4.760)
G^2	-9.900***	-8.175***	-7.963***	-1.031	-24.24**	-42.53	-33.78***
	(3.025)	(2.667)	(2.952)	(1.218)	(9.804)	(26.91)	(11.42)
HDI		0.0411***	0.0653***	0.0195***	0.0390***	0.0395***	0.0471***
		(0.0101)	(0.0124)	(0.00659)	(0.00813)	(0.0120)	(0.00833)
Unemployment rate		2.685***	3.726***	1.866***	2.452***	2.557***	2.782***
		(0.652)	(0.690)	(0.467)	(0.422)	(0.495)	(0.602)
Log GDP p.c.		0.105	0.173**	0.0394	0.0494	0.0528	0.0119
		(0.0670)	(0.0726)	(0.0444)	(0.0688)	(0.0793)	(0.0624)
Urban district		0.275***	0.424***	0.150**	0.220*	0.458***	0.265***
		(0.105)	(0.103)	(0.0623)	(0.113)	(0.167)	(0.0817)
Lagged dep. var.				0.579***			0.364***
				(0.0331)			(0.0254)
Constant	4.097***	0.739	-2.225**	0.213	0.755	-1.475*	-2.882***
	(0.0721)	(0.683)	(0.950)	(0.384)	(0.570)	(0.838)	(0.566)
Observations	2,974	2,868	2,868	2,411	2,868	2,868	2,411
Number of district	495	495	495	304	495	495	304
Province fixed effects	No	No	Yes	Yes	No	Yes	Yes

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. RE = random-effects estimator; IV = instrumental variable regression. Trust index was dropped because it was only available for 2014. Gini ratio for income inequality was also dropped because there were no reliable data for all districts from 2005 to 2014. Its coefficients were also insignificant in the main regressions. The HDI for 2005 to 2013 was calculated using the old (pre-2014) method, while the value for 2014 was calculated as $\frac{HDI_{2013}^{old}}{HDI_{2013}^{new}} \times HDI_{2014}^{new}$, where *new* refers to the actual HDI calculated using the new method. This technique was used because HDI data calculated using the new method were only available from 2010 onward. Province was preferred to island/regional fixed effects because, before 2014, there was a disproportionate coverage of the NVMS. For example, all provinces in the eastern region were covered from 2005 to 2014, while only three (out of 10) and two (out of seven) provinces in Sumatra and Java-Bali were covered, respectively.

4.6.2 Esteban-Ray Conflict Model

One of the motivating theories in this study was the Esteban-Ray model of conflict. The regressions in Table 4.10 were specified to closely mimic the empirical specifications of this model, with the number of people killed from violent conflict as the dependent variable and the simultaneous inclusion of all three distributional indices (Esteban et al., 2012).[13] Also, following this model, G/N—where N is the number of population—was used instead

[13]The authors used a binary dependent variable in their empirical specification because of the lack of reliable cross-country data on conflict intensity. Fortunately, the NVMS includes the number of people killed from violent conflict and was used in these regressions.

Table 4.10: Esteban-Ray model of conflict (dependent variable: number of people killed from violent conflict)

	(1)	(2)	(3)	(4)	(5)	(6)
	NB	NB	NB	XTNB	XTNB	XTNB
G/N	-0.351	-0.167	-0.163	-0.0887*	-0.0597	-0.0708
	(0.246)	(0.160)	(0.160)	(0.0454)	(0.0447)	(0.0456)
F	0.00789	-1.030**	-1.014**	-0.0226	-0.458**	-0.460**
	(0.412)	(0.436)	(0.423)	(0.177)	(0.205)	(0.206)
P	17.18***	7.562*	7.429*	5.341***	3.803***	4.150***
	(6.210)	(3.955)	(3.894)	(1.429)	(1.462)	(1.488)
Lagged dependent variable		0.162***	0.165***		0.0155**	0.0136*
		(0.0273)	(0.0274)		(0.00710)	(0.00704)
Log population	0.670***	0.394***	0.412***	0.786***	0.783***	0.753***
	(0.120)	(0.103)	(0.102)	(0.0495)	(0.0563)	(0.0578)
Log GDP per capita			-0.0677			0.173***
			(0.132)			(0.0601)
Constant	-8.875***	-5.071***	-5.180***	-10.13***	-9.720***	-9.627***
	(1.678)	(1.430)	(1.386)	(0.657)	(0.740)	(0.749)
Observations	495	304	304	2,974	2,523	2,523
Number of id	495	304	304	495	304	304

Notes: Robust standard errors (Models 1 to 3) and standard errors (Models 4 to 6) in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. NB = negative binomial; XTNB = random effects panel negative binomial.

of G.

Only the estimated parameters for P were always positive and significant, as in Esteban-Ray's empirical results, which suggests that polarisation increases the intensity of conflict over public goods. Albeit insignificant, the estimated coefficient for G/N was negative, similar to the results in Esteban et al. (2012), which signals the free-riding motive might not be as strong as the prediction from the model. Unlike Esteban-Ray empirical results, the coefficients for F in Models 2 and 3 were negative because of the inclusion of the lagged dependent variable.[14] Adding this variable also biased down the size of P's coefficient. Models 4 to 6 used panel data, where the results were largely the same, except now the estimated parameter for per capita GDP was positive and statistically significant (Model 6). Together, the regressions do not seem to support the Esteban-Ray conflict model. Nonetheless, they provide some evidence on the role of cultural diversity in explaining the intensity of violence.

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[14]When G and G^2 were used instead of G/N in Model 3, the non-linear term and P became insignificant.

4.7   Conclusion

This study has revealed some interesting insights for the ongoing discourse on the economics of conflict literature. First, income as measured by log of per capita GDP was not associated with intensity of violence. Second, it appears that the relationship between cultural diversity and intensity of violence was non-linear. However, this finding was subject to regional variations, except when panel data were used. Third, despite the non-linearity, most districts were in the region where the correlation was positive, which suggests a detrimental effect of cultural diversity in most of Indonesia. Fourth, the findings were robust to alternative dependent variables and the addition of various covariates (which included some institutional measures of decentralisation and religion). Fifth, income inequality played an important role once regional fixed effects were included. Sixth, only one institutional variable—the number of places of worship—was directly associated with a lower intensity of violence. Finally, Esteban and Ray (2011) model of conflict could not fully explain the intensity of violent conflict in Indonesia.

The findings from this study indicate the importance of the antecedents of violence (economic, institutions and grievance factors), thus answering the first research question, although there is evidence that the role of cultural diversity (a proxy for ethnic grievance) is more pronounced. Specifically, the variable's curvilinear association with intensity of violence answered the second research question. The non-linear relationship was the first to be observed at country level which complements a cross-country study (Mason et al., 2011). This finding is also consistent with previous studies (Pierskalla & Sacks, 2017; Tajima, 2013), although, in this study, the relationship was stronger and non-linear.

This study has the following policy implications. Law No. 5/2017 on Cultural Advancement, for example, considers cultural diversity as the 'nation's wealth and identity', but also emphasises the principle of tolerance. The 2019 Government Work Plan also acknowledged the importance of ethnic diversity on violence and devoted activities on conflict management. The rising income inequality should be addressed given its effects on violence, which can be achieved by promoting health and education services to the poor.

That being said, there is still much work to be done to understand the mechanism behind the results. The main theory behind this study was aimed at understanding civil wars, not everyday violence, in which the results were only partially consistent. In addition, the representative data of Indonesia were only available as a cross-section in 2014, which constrained further generalisation of the results, particularly regarding the non-linearity result. Therefore, future research agendas should focus on finding the mechanisms that can explain small, everyday violence and on generalising the results using other data, including data obtained using experimental methods.

Part III

The Consequences of Conflict on Antisocial Behaviour

Chapter 5

Antisocial Behaviour Experiments: A Review

The third part of this thesis discusses the experimental works on antisocial behaviour, including a review of existing work (in this chapter) and an empirical investigation (Chapters 6 and 7). As briefly mentioned in the introductory chapter, most post-conflict experiments have observed prosocial behaviour. However, antisocial behaviour is also important because it poses negative effects for inter- and intra-community relations. It also encapsulates behaviour in an actual conflict. Therefore, this chapter is aimed at exploring antisocial behaviour—elicited through economic experiments—by focusing on games that capture pure spite and identifying the factors that explain the behaviour.

5.1   Introduction

There is an increasing number of experiments aimed at understanding the long-term effects of conflict on individual behaviour. A meta-review on post-conflict experiments indicated strong evidence that experience of war or violence is positively correlated with higher cooperation, with some theoretical explanations proposed for this finding (Bauer et al., 2016). Experience of violent conflict has been considered to create psychological changes and disorders in both adults and children, and the effects may continue long after the wars end (Jakupcak et al., 2007; Palmieri, Canetti-Nisim, Galea, Johnson, & Hobfoll,

2008; Slone & Mann, 2016). The psychology literature on post-traumatic growth also indicates that war victims experience a change in general preference on life, including other-regarding preferences (Calhoun & Tedeschi, 2014; Tedeschi & Calhoun, 2004). This argument challenges common presumptions that mutual trust is destroyed in polarised societies because of civil wars (Waldmann, 2003), or at least argues that the negative psychological effect of war is not permanent.

Studies in post-conflict regions also indicate a temporary effect of parochialism. For example, higher in-group parochialism was found among the victims of the Georgia-Russia war and the Sierra Leone war (Bauer, Cassar, Chytilová, & Henrich, 2014), but sustained contact through an inter-group project helped reduce inter-group discrimination when the participants were paired with religious out-group members (Scacco & Warren, 2018). Meanwhile, a study in Ambon, Indonesia (a region that experienced Muslim-Christian conflict in 1999 to 2000), only found moderate effects of the past conflict on out-group discrimination (Werner & Lambsdorff, 2019). However, these studies mostly focused on prosocial behaviour, yet antisocial behaviour is prevalent in conflict situations and captures the dark side of human behaviour. It also signals weak community cohesion, which endangers security and peace in the long term. Therefore, this chapter reviews antisocial behaviour experiments in the literature and identifies the antecedents of such behaviour.

This thesis follows the literature in the definition and use of the term 'antisocial behaviour'. Specifically, antisocial preferences are defined as 'pleasure derived from lowering somebody else's well-being, even if this comes at an own cost and in absence of negative reciprocity (we also refer to this kind of attitude as *nastiness*)' (Abbink, Masclet, & Veelen, 2011, p. 1). Further, the terms 'nasty', 'spiteful' and 'malevolent' refer to the same behaviour, and are used interchangeably in this thesis.

In this chapter's literature review, three criteria were used for the inclusion of antisocial behaviour games that capture spite: (i) the game must be strategic (where a player's payoff depends on other players' actions); (ii) at least one of the strategies must be a spiteful one; and (iii) punishment games, such as the public goods game with punishment, were

excluded. From the first criterion, experiments that could observe antisocial behaviour yet did not involve strategic decision making, such as cheating and lying games (Cadsby, Tapon, & Song, 2010; Fischbacher & Follmi-Heusi, 2013; Gravert, 2013), were excluded. Although they are useful to understand bad behaviour, the observed behaviour might not necessarily be out of spite. Games where participants only choose between some pairs of allocations—which is not necessarily Pareto-damaging (e.g., E. Fehr, Glätzle-Rützler, & Sutter, 2013; Kerschbamer, 2015)—were also excluded, even though they can be useful in classifying participants' preferences.

The second criterion was used to filter out actions that are rationally motivated by material benefit, such as taking money from others in the fragile public goods game (Hoyer, Bault, Loerakker, & van Winden, 2014), undervaluing competitors' outcomes in the sabotage game (Carpenter, Matthews, & Schirm, 2010; Habring & Irlenbusch, 2011) and 'attacking' other players in the anarchy game and destruction game (Powell & Wilson, 2008; Scacco & Warren, 2018).

The third criterion was selected because punishment games have been widely studied, such as ultimatum game (Oosterbeek, Sloof, & van de Kuilen, 2004) and public goods game (Thoni, 2014), where some experiments were conducted in the field, such as in India (E. Fehr, Hoff, & Kshetramade, 2008) and dozens of societies around the globe (Herrmann, Thoni, & Gächter, 2008). Punishments in these games are typically introduced as a norm-enforcing mechanism, which is arguably a different motivation than pure spite. Therefore, in the following part of this review, the focus is on antisocial behaviour in non-punishment games.

With these criteria, antisocial behaviour economic games can be classified into payoff-destruction games and spiteful auctions. Payoff-destruction games are commonly implemented using the money-burning (MB) game (Zizzo & Oswald, 2001) or the joy-of-destruction (JoD) game (Abbink & Herrmann, 2011; Abbink & Sadrieh, 2009). In these games, players are given the opportunity to reduce ('burn') other participants' money (always at some marginal price in the MB game, but sometimes for free in JoD games). In the original MB game, each player may reduce his or her own money and any other

participants' money, but, in subsequent studies, the game can be played in pairs. In the JoD game, because of its dyadic nature, payoff-destruction can only be aimed at each participant's partner.

While these games are used to elicit spite, the observed behaviour might not be *purely* driven by spite. For example, some participants received a (randomly allocated) advantage over others in the original MB game (Zizzo & Oswald, 2001). This feature was introduced to create a sense of unfairness, which is argued to have driven spite. Therefore, payoff-destruction experiments are often used to find antecedents of spite, such as emotions and social environments.

There are several antisocial behaviour games that are part of market mechanisms (auctions). Morgan, Steiglitz, and Reis (2003) developed a theoretical work based on four standard types of auctions, where the theory predicts the existence of spite motive, with people aggressively bidding in first-price auctions after knowing that their opponents are not machines. They also predict that aggressive subjects in first-price auctions should be more aggressive in second-price auctions. Empirically, the experiment is designed so that bidders know their own private valuation of the item and, in the complete information condition, know other bidders' private valuations (and vice versa for the incomplete information condition) (Nishimura, Cason, Saijo, & Ikeda, 2011). Around half of the participants bid spitefully in the complete information condition, while the rate dropped in the incomplete information condition.[1] In another study, Kimbrough and Reiss (2012) measured spite in a dynamic second-price auction, and found that people are either always spiteful or not spiteful at all. This means that, when a person wants to be spiteful, he or she will do it consistently and at the maximum level.[2] Unlike payoff-destruction games, spiteful auctions are almost exclusively conducted with university students.

While understanding spiteful auctions has its merits, the focus of this thesis is payoff-destruction games that capture spite. Before delving into the details of payoff-destruction

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[1]They also observed underbidding by high-value bidders, which explains that spiteful acts may backfire on spiteful bidders. Such reciprocal spite occurred when a low-value bidder bid above their private valuation to reduce the winner's payoff, while, in contrast, a high-value bidder facing a spiteful low-bidder would allow themselves to lose to force the spiteful bidder to receive a negative payoff.

[2]There is also a work in progress that combines a survey measure of spitefulness with spiteful auction (Kirchkamp & Mill, 2019).

games, Section 5.2 will first review several theories on social preferences and the way spite is incorporated in them. Section 5.3 reviews the use of payoff-destruction games and the general experimental results, while Section 5.4 elaborates the various factors that have been found to explain spite. Finally, Section 5.5 summarises the main findings of this chapter.

5.2   Behavioural Theories of Spite

Scientists have theorised spite from many aspects, from evolutionary biology (Hamilton, 1964a, 1964b) to game theory (Hamburger, 1979). For example, in the spite game (Hamburger, 1979), the upper-left cell of the payoff matrix (Table 5.1) represents the best strategy for both players. However, if A's utility is negatively dependent on what B is obtaining, he or she will choose (3, 1) so that the difference in payoff received is maximised in favour of A. In other words, A is willing to receive a lower payoff as long as the payoff gap is the largest. However, this scenario creates another motive for players to deviate from the best strategy. That is, if B anticipates that A is a difference-maximiser, then B's best decision should be (3, 1).[3] If that is the case, his or her action is essentially the same as being a difference-maximiser him/herself—B would choose the right column in the matrix.

This section focuses on relevant *behavioural* theories of spite that are under the umbrella of other-regarding preferences. Other-regarding preference is a growing subject in experimental and behavioural economics, where theoretical models are developed to explain phenomenon such as fairness and altruism, which formalised the concept of spite. For example, Levine (1998) defined an individual i in n-person games as being spiteful if the utility of an individual j negatively affects i's utility.[4] This definition is also found in studies that measure spite in public goods game literature (Cason, Saijo, Yamato, & Yokotani, 2004; Saijo & Nakamura, 1995), which bear a close resemblance to the antisocial

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[3]Unless if B is unwilling to be the subject of A's malice, in which B would choose (0, 0).

[4]In experiments, a spiteful type must choose spiteful strategy that leads to action (or a set of actions) that reduce the payoff of the player and the partner(s), in comparison with actions that maximise the player's own payoff.

Table 5.1: The spite game

		B	
		4, 4	1, 3
A		3, 1	0, 0

behaviour games reviewed in this chapter. Therefore, essentially, spite is observed when there is no private material incentive for doing so.

Spite motive is embedded in some other-regarding models because it is often thought to be the opposite side of, yet still on the same spectrum as, prosocial motive. However, as will be seen in the experimental works, participants sometimes behaved both spitefully and prosocially, which suggests that these motives may not necessarily be within the same spectrum.

E. Fehr and Schmidt (2000) distinguished three ways to approach other-regarding preferences in a non-axiomatic way (i.e., by starting with a specific utility function). The first approach (social preferences) models an individual's utility function to depend on the division of the financial payoff among all individuals in the relevant reference group, in addition to his/her own financial payoff. The second approach (interdependent preferences) considers the type of co-participant that affects an individual's own preference. The third approach (intention-based reciprocity) is concerned with an individual's belief about his or her co-participant. The rest of this section uses this classification to group behavioural theories that could explain spiteful behaviour.

5.2.1   Social Preferences

Bolton and Ockenfels (2000) modelled an individual i's utility $u_i = u_i(y_i, \sigma_i)$ to comprise own (positive) payoff, y_i, and relative payoff share, σ_i, where:

$$\sigma_i = \begin{cases} y_i / \sum_{j=1}^{n} y_j & \text{if} \quad \sum_{j=1}^{n} y_j > 0, \\ 1/n & \text{if} \quad \sum_{j=1}^{n} y_j = 0. \end{cases}$$

The utility function is assumed to be weakly increasing and concave in y_i, strictly concave in σ_i and, importantly, reach a maximum at $\sigma_i = 1/n$. The latter condition

implies that an individual with such utility function will prefer an equitable payoff division. This model is also qualitatively similar to E. Fehr and Schmidt (1999) utility function:

$$u_i = y_i - \frac{\alpha_i}{n-1} \sum_{j \neq i} \max\{y_j - y_i, 0\} - \frac{\beta_i}{n-1} \sum_{j \neq i} \max\{y_i - y_j, 0\},$$

where the second term captures the disutility from having other participants earn more (in absolute terms) than the individual, while the third term reflects the individual's distaste of being ahead of other participants. It is also assumed that $\alpha_i \geq \beta_i$, which means that, relative to being advantageous, the disutility from being disadvantageous is greater. To summarise, in both models, an individual compares his or her relative payoff standings with other participants and selects a strategy that aims to reduce the difference in payoff.

Social preference theories deal with spite indirectly in the models discussed earlier. For example, in experiments where participants received unequal endowment, a participant that has a social preference may choose a strategy that minimises the inequity—such as by reducing other participants' payoffs—even though it does not directly bring additional payoffs to him/herself.

During the past decade, the emergence of spiteful behaviour games has created a new type of social preference. Abbink and Sadrieh (2009) introduced the JoD game, where pairs of individuals have the opportunity to reduce each other's money in the absence of unequal endowment in expectation. In a sense, this game is the direct opposite of the dictator game. The behavioural prediction of this game is straightforward (i.e., no payoff-destruction), but, when money is destroyed, the only plausible explanation is spite. That is, the destroyer receives utility from seeing the other person lose money:

$$u_i = x_i - u_j,$$

where x_i is the direct utility for person i and u_j is j's utility ($j \neq i$). This simple model can be extended to allow giving decision, such as in a double-dictator game, where the individual has the chance to either reduce or add money, w, for the other individual (Sadrieh & Schröder, 2016):

$$u_i = x_i + \begin{cases} 0 & \text{for} \quad w \geq 0, \\ u_j(w) & \text{for} \quad w < 0. \end{cases}$$

In this utility function, the individual has a purely spiteful or antisocial preference, as he or she does not receive any enjoyment from giving money to others. Rather, the person obtains additional utility from reducing other players' money. Such antisocial preference is the direct opposite of Andreoni and Miller (2008) model, where a social maximiser in a dictator game would always try to choose allocations that result in the greatest total amount of payoff for both parties.

It can also be contrasted with the warm glow preference, where an individual receives utility simply from giving money to others, without actually caring about their utility (Andreoni, 1989). This can be extended to antisocial behaviour experiments where an individual might be receiving utility simply from the act of reducing other's money.

5.2.2   Interdependent Preferences

As briefly mentioned before, Levine's model considers a person's utility to be affected by another person's utility. Specifically, in an n-player game,

$$u_i = x_i + \sum_{j \neq i}^{n} u_j \left(a_i + \lambda a_j \right) / (1 + \lambda),$$

where, again, x_i is the direct utility for person i and u_j is the utility of a person j other than i. In addition, $0 \leq \lambda \leq 1$ and $-1 < a_i < 1$. The parameter a_i reflects individual i's regard towards j, where a negative (positive) value means that the individual is spiteful (altruistic). When $a_i = 0$, the individual is of a selfish type.

Levine calibrated the value for a_i using multi-country ultimatum data from Roth, Prasnikar, Okuno-Fujiwara, and Zamir (1991) and conjectured the distribution of the 'spiteful' type to be 20 per cent. He defined the 'spiteful' type as those who demanded USD 7 (out of the maximum USD 10) in the ultimatum game.[5] While the definition of spite based on the ultimatum game results might not satisfy everyone, the theoretical

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[5]The 'normal' type would demand USD 6, while the 'altruistic' type would demand USD 5.

model is clear and provides a transparent mechanism to indicate how an individual's utility is affected by that person's regard of the other participants.

5.2.3   Intention-based Reciprocity

Rabin's (1993) theory can be understood by examining a two-player game with two levels of beliefs. Upon choosing a strategy, Player 1 forms a belief of Player 2's strategy and then defines the kindness function: the ratio of the difference between the actual payoff (which is conditional on the belief about Player 2's strategy) and the fair payoff as the numerator, and the range of all possible payoffs as the denominator. Player 1 will also need to form a belief of the kindness of Player 2, which means that the person needs to anticipate the belief that Player 2 has towards him or her, and then form his or her kindness function. Together, Player 1's utility function consists of own payoff y_i, kindness function f_i and Player 2's kindness function f'_j:

$$u_i = y_i + f'_j \left(1 + f_i \right).$$

Both f_i and f'_j must lie in the $[-1, 0.5]$ interval. If Player 1 thinks that the other player is going to be spiteful or unkind ($f'_j < 0$), then it is of his or her best interest to be unkind as well.

Rabin's contribution to the other-regarding literature by introducing beliefs was further developed to include beliefs about intentions in sequential games or was combined with the social preference model (Charness & Rabin, 2002; Falk & Fischbacher, 2006).

5.3   Payoff-destruction Games

The previous section discussed several behavioural theories of spite, some of which have been explored through experiments. This section reviews experiments that are used to test predictions from payoff-destruction games. Before discussing these games and experiments, the first sub-section provides the conceptual basis for lab-in-the-field experiments, which are sometimes used to study antisocial behaviour.

5.3.1   Lab-in-the-field Experiments

Laboratory and field experiments methodologically complement each other, rather than the latter being a special case of the former, because the loss of the field context when an experiment is conducted in the laboratory (Harrison & List, 2004). Further, there are six factors that can be used to determine the context of an experiment: subject pool, information, commodity, task or rules applied, stakes and the environment. They further broadly classified the different types of field experiments: artefactual, framed and natural field experiment. An artefactual field experiment is the closest to a standard laboratory experiment, with the exception that the subjects are not students. A framed field experiment exploits one of three field contexts (information, commodity, task or rules applied), while a natural field experiment is like a framed field experiment, except that the subjects are unaware that they are being studied. Figure 5.1 indicates how, along the spectrum of empirical methods, field experiments bridge laboratory and naturally-occurring data.

Other researchers expanded this taxonomy by emphasising the role of the experimenter; that is, an experiment is not a field study if the action of the experimenter would generate the observed activity (Charness et al., 2013; Gneezy & Imas, 2017). Therefore, according to this classification, experiments conducted with nonstandard subject pools, but using standard economic games—such as public goods games or dictator games—should not be classified as a field experiment. Rather, they should be classified as an 'extra-lab' or 'lab-in-the-field' experiment (other researchers preferred different terms such as 'lab-like field experiment' in Viceisza, 2016). In this thesis, the term 'artefactual field experiment' and 'lab-in-the-field experiment' refer to experiments with nonstandard subject pools conducted in natural environments.

In this thesis, the main experiment in Aceh was conducted outside the laboratory, but using a variation of the JoD game. Such a lab-in-the-field experiment is preferred to a standard laboratory experiment because war is not a normal experience for everyday people—it affects people directly and is impossible to reproduce in the laboratory. Further, in the districts where the experiment was conducted, universities or similar higher

Controlled Data			Modeling Naturally-Occurring Data	
LAB	AFE	FFE	NFE	NE, PSM, IV, STR

Figure 5.1: Laboratory, field and naturally-occurring data
Source: List (2007).
Notes: AFE = artefactual field experiments; FFE = framed field experiments; NFE = natural field experiments; LAB = laboratory; NE: natural experiments; PSM = propensity score matching; IV = instrumental variable; STR = structural modelling.

education institutions were only located in the city centre. Using these locations for the experiment would not only bias the sample, but would also remove the conflict context, as Aceh rebels were mostly fighting in rural areas.

5.3.2 A Summary of Results

Zizzo and Oswald (2001) introduced the MB game and hypothesised that destroying others' money was motivated by inequity aversion. They found that payoff-destruction was consistent with Charness and Rabin (2002) model and the non-linear version of E. Fehr and Schmidt (1999), but not with Bolton and Ockenfels (2000) model of inequality aversion. Subsequently, experimental works indicated that inequity aversion drives most of the behaviour. For example, Kebede and Zizzo (2015) directly tested the behavioural prediction of E. Fehr and Schmidt (1999) and Bolton and Ockenfels (2000) in multivariate regressions, and found that only the former's prediction that was supported by the data. They found the empirical data to be in the opposite direction of Bolton and Ockenfels (2000) prediction: the greater the ratio between one's own income and the mean of the other participant's payoffs, the more likely the participants would burn the money.

MB experiments indicate that fairness regarding *how* the payoff is generated is an important determinant of payoff-destruction, both in the laboratory (Dickinson, Masclet, & Peterle, 2018; D. Fehr, 2018) and the field (Zeballos, 2018). In one of the treatments, participants were given bonus payments that, according to most social preference models, would increase burn rate (D. Fehr, 2018). However, because the bonus payments were given fairly—they corresponded to their results in the real-effort task—the burn rate was expected to be the same, which was confirmed by the experimental data. Similarly, the

probability of participants' money being burnt increased by 29 percentage points when they were placed in an advantageous position to earn more money (Zeballos, 2018).

While the MB game has contributed much to the antisocial behaviour literature, its focus on fairness means that it overlooks the pure spite motive. With the absence of expected unequal payoff distributions, the JoD game was introduced to elicit pure spite (Abbink & Herrmann, 2011; Abbink & Sadrieh, 2009). The game is not used to test reciprocity models, but belief expectation has been included in the experimental design, where negative belief—the belief that the co-participant is willing to burn money—strongly predicts money burning (Abbink & Herrmann, 2011; Prediger, Vollan, & Herrmann, 2014). The findings from the JoD experiment indicate that a smaller amount of endowment obtained—which is equal in expectation—is not associated with a higher burn rate (Abbink & Sadrieh, 2009). This is in contrast to the models of Bolton and Ockenfels (2000) and E. Fehr and Schmidt (1999), which assume that people dislike inequity, irrespective of whether the inequity is in favour of them or not.

Antisocial behaviour might be motivated by envy, but this seems to not be the case as it could not predict money-burning among the sub-sample of unemployed subjects in a study on labour market discrimination (Dickinson et al., 2018).[6] However, this finding should be interpreted with caution because the number of observations was relatively small, with $n = 48$.

A variation of the JoD game was developed in which participants were asked to select the payoff (in an integer between 0 to 10 euros) for their co-participant prior to the actual matching (Bracht & Zylbersztejn, 2018). Afterwards, participants randomly chosen as Player A would obtain 10 euros, while the rest (Player B) would receive whatever amount their co-participant chose for them before the pairing (participants knew about the two types of player when they made the allocation decision). The authors found a 22 per cent burn rate, which is close to Levine (1998) conjecture of the distribution of spiteful type. However, their finding contrasts with the results from a similar game, where the burn rate was only one to two per cent (Razen, 2019). In this game, a distributor made an

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[6]Envy was elicited through a social preference task (Blanco, Engelmann, & Normann, 2011).

allocation $0 \leq x \leq 1$ between him/herself with a recipient, knowing that, when $x > x^*$, the discrepancy $|x - x^*|$ would be forfeited for the recipient. In other words, choosing any amount larger than x^* offered no benefit to the distributor (he or she received money x^* at the maximum), while hurting the recipient at the same time. Therefore, this game is similar to (Bracht & Zylbersztejn, 2018), except, here, the exogenously-determined cut-off point x^* was absent.

At one extreme, two variations of JoD game—the first-strike game and pre-emptive Strike game (Abbink & de Haan, 2014; Simunovic, Mifune, & Yamagishi, 2013)—allow participants to burn a significant payoff of and 'deactivate' their partner. These games essentially reflect the defensive aggression strategy in real-life situations; for example, the 1967 Six-Day War is considered a pre-emptive attack by the Israeli against an imminent threat from the Egyptian forces. The experiments indicated that up to 80 per cent of participants are willing to destroy others' money. Similarly, when participants have the option to bind themselves from burning money, subjects burn more when both are unbound (77 per cent) than when their partner is bound (60 per cent) (Jauernig & Uhl, 2019).

At the other extreme, participants could play both the dictator game and JoD game (L. Zhang & Ortmann, 2016) or the double-dictator game (the decision to destroy payoffs is given as another option besides giving) (Sadrieh & Schröder, 2016). In these studies, a significant proportion of participants had a mixed preference, where they both gave and destroyed others' money (20 and 34 per cent, respectively). However, only six per cent were purely antisocial (those who only destroy and never give) in the latter study. Coincidentally, the proportion of pure antisocial participants was also six per cent in the baseline condition of the former study.

Burn rates—the percentage of money-burning decisions—are lower when payoff-destruction games are played repeatedly. For example, the rates dropped from around 25 per cent to almost zero in just three rounds when the money-burning decision was observable after each round (Abbink & Sadrieh, 2009). Similarly, the rates were halved in just three rounds of play in other experiments (Abbink et al., 2010; Karakostas & Zizzo,

2016). The only exception was in the first-strike game, where the rate did not dropped, and in fact increased in some of the treatments over the 18 rounds.

Antisocial behaviour games can also be used to observe conflict at a group level. In the mobbing game (Abbink & Doğan, 2018)—which is similar to the collective money-burning game (Abbink, Masclet, & Mirza, 2011)—each participant in a group of four may choose one other participant who, if selected by all other three participants, will lose all the payoff. The researchers found that, unsurprisingly, the mobbing formation rate was lower when it did not entail personal benefit to the perpetrators (i.e., mobbing for pure spite). Predictions made by social preference theory could not explain the occurrence of mobbing: the predicted drop in the mobbing formation was not observed even when one of the group's participants was 'safe'.[7] Given that there was no drop in the mobbing formation, greed seemed to be the only predictor for the mobbing decision.

In the pointless vendetta game (Abbink & Herrmann, 2010), each member of a four-people group may choose to destroy the payoff of the other group at some cost. The researchers found that the destruction rate was lower when there was possible retaliation. In a field setting, the effect of deciding in a group (for money burning of a random counterpart) was more detrimental than in the situation where individuals made decisions in isolation (Bauer, Cahlíková, Celik Katreniak, et al., 2018).

Table 5.2 summarises the results of the payoff-destruction experiments. The review includes both journal publications and works in progress to minimise publication bias. An accompanying table (Appendix A, Table A.7) shows that, while most (29 of 38) payoff-destruction experiments were conducted in the laboratory with standard subject pools (university students), the number of experiments with nonstandard subject pools—mostly civilians in developing countries—is not negligible.

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[7]In this treatment, the safe participant would not lose the payoff if selected as a victim; therefore, mobbing only occurred when a safe participant participated.

Table 5.2: List of payoff-destruction experiments

Source)	Participants	Game	Gender	Main findings
(1)	(2)	(3)	(4)	(5)
Zizzo and Oswald (2001)	116 of mostly United Kingdom (UK) university students	MB	N/A	Deservedness (rank egalitarianism) and expectation of money destroyed explain money burning. The decision to destroy money is not sensitive to the price of destruction.
Zizzo (2003)	87 UK university students	MB	N/A	Burn rate remains large despite removing expectation of money burning. Around 75 per cent appears to be rank egalitarian.
Zizzo and Fleming (2011)	216 UK university students (native speakers)	MB	N/A	Participants destroyed and gave more (pure altruism or pure spite not observed on average). This result was driven by social pressure—i.e., players who were sensitive to social pressure tended to give and destroy more.
Kebede and Zizzo (2015)	240 rural Ethiopian villagers; 120 Ethiopian university students	MB	No effect	The decision to burn money was motivated by inequity aversion. Revenge (negative reciprocity) did not become statistically significant in explaining money burning. Money burning was negatively associated with agricultural innovations (data taken from a concurrent household survey that contained questions such as whether participants grew new crops).
Gangadharan, Islam, Ouch, and Wang (2017)	492 Cambodian civilians	MB	No effect	Participants who lived in districts with a high mortality rate and direct exposure to genocide tended to burn more.
Islam et al. (2017)	762 Indian civilians	MB	Mixed effect	Exposure to the Assam riots was positively associated with money-burning behaviour.
Dickinson et al. (2018)	48 French university students	MB	N/A	Payoff destructions recorded when participants were disadvantaged by favouritism aimed at others.
D. Fehr (2018)	248 German universities students	MB	N/A	By itself, inequality did not lead to money-burning decisions, but was mediated by the mechanism through which income was generated.
Gangadharan, Grossman, and Vecci (2018)	370 Australian university students	MB	No effect	Money-burning game played in a group of 10. Burn rate was higher when participants could not change their income class.
Zeballos (2018)	285 Bolivian dairy farmers	MB	Women burn more	Participants earned money through real-effort task. More than half of the participants destroyed others' money, particularly against those with higher productivity.
Gangadharan, Grossman, Molle, and Vecci (2019)	186 American university students	MB	N/A	In a group of six, participants with low income tended to burn more money towards people of different social or income identity. There was no such effect among high-income participants.

Source	Participants	Game	Gender	Main findings
(1)	(2)	(3)	(4)	(5)
Abbink and Sadrieh (2009)	40 Dutch university students	JoD	N/A	Money burning could not be explained by inequity aversion because the largest amount of money burnt happened when both players had the same level of endowment.
Abbink and Herrmann (2011)	131 Ukrainian universities students	JoD	No effect	Hiding the decision to burn others' money under nature increased burning rate.
Kessler, Ruiz-Martos, and Skuse (2012)	606 Hungarian universities students	JoD	No effect	Destruction rate (the unilateral version of the burn rate in JoD game) was lower when the decision was unilateral.
Baillon, Selim, and van Dolder (2013)	153 Dutch university students	JoD	N/A	Pictures of eyes negatively affected money-burning behaviour.
Prediger et al. (2014)	120 Namibian villagers	JoD	No effect	Burning rate was more intensive in the community that faced higher competition and scarcer resources.
Zeitzoff (2014)	98 Israeli civilians	JoD	N/A	Exposure to violence reduced intragroup conflict. Some participants primed with anger had mixed effects on the decision to destroy their partner's money. Participants with higher exposure to rocket attack were more willing to take revenge.
Basurto, Blanco, Nenadovic, and Vollan (2016)	127 Mexican civilians	JoD	No effect	Both antisocial behaviour and contribution to public goods were higher in marine protected areas (MPAs) than in non-MPAs. Economic development unique to MPAs and increased group identity may explain this result.
Jauernig, Uhl, and Luetge (2016)	218 German university students	JoD	Mixed	Competition escalated money burning. Losers were punished more by winners than losers, but winners were equally punished by both.
Karakostas and Zizzo (2016)	390 UK university students	JoD	No effect	Giving orders or cues to destroy money significantly increased spiteful behaviour.
L. Zhang and Ortmann (2016)	143 Australian university students	JoD	Mixed	Context matters: actions made by participants were subject to which decision game was played first. Players were less altruistic when JoD game was played ahead of dictator game.
Diamond and Blackwell (2017)	74 American university students	JoD	No effect	Hugging was negatively associated with money burning.
Bauer, Cahlíková, Chytilová, and Zelinsky (2018)	327 Slovakian adolescents	JoD	N/A	Burning rate doubled when facing the Roma ethnic minority (who are often the target of ethnic hostility).

Source	Participants	Game	Gender	Main findings
(1)	(2)	(3)	(4)	(5)
Bauer, Cahlíková, Celik Katreniak, et al. (2018)	630 Slovakian adolescents; 1679 Ugandan adolescents	JoD	N/A	In both experimental locations, participants in groups made more money-burning decisions (against other groups) than when participants made the decisions individually. Group, rather than deliberation, effect drove the result.
Dickinson and Masclet (2019)	123 French university students	JoD	No effect	Using trolley problems to elicit dubious ethical decisions predicted spiteful behaviour.
Almås et al. (2019)	864 American university students; 995 Kenyan university students	JoD	Men burn more	Participants in Kenya who were exposed to relatively high laboratory room temperature burnt more money than in the control group. Current political situations and emotions may have driven the result. No effect for the American sample or with regard to other behaviours.
Jauernig and Uhl (2019)	286 German university students	JoD	N/A	Spite was the main motive for money burning, as indicated in the 60 per cent burn rate of unbound participants when facing bound participants in the self-binding treatment.
Vicente and Vilela (2019)	353 young (14-44 years of age) Mozambique males; 30 American university students	JoD	N/A	In the main (Muslim) sample, the promotion against Islamic extremism program reduced the burn rate relative to the control group. Relative to the Muslim co-participants, foreigners had more of their money burnt. In all samples, Christian and foreigner participants burnt more and less, respectively, relative to their Muslim counterparts.
J. Zhang, Brown, and Xie (2019)	124 participants, mostly Canadian universities students	JoD	N/A	Antisocial behaviour was not affected by religious priming, but positively correlated with a multidimensional measure of religiosity.
Bracht and Zylbersztejn (2018)	198 participants (~80% French university students)	JoD equivalent	No effect	Differential moral judgement by gender occurred even after controlling for spiteful behaviour.
Razen (2019)	288 Austrian university students	Spite	No effect	Very few participants with spiteful preference (1 to 2 per cent) relative to those with greed preference (10 to 23 per cent; elicited with the greed game).
Abbink and Doğan (2018)	860 Dutch and German university students	Mobbing	N/A	Giving a larger monetary benefit for mobbing increased mobbing formation. Social preference theory could not explain mobbing decisions.
Abbink and Herrmann (2010)	144 Turkish university students	Pointless vendetta	N/A	When there was the possibility of continuing retaliation, the rate of payoff-destruction decreased.

Source	Participants	Game	Gender	Main findings
(1)	(2)	(3)	(4)	(5)
Abbink and de Haan (2014)	160 Dutch university students	First-strike	No effect	Fear of revenge fuelled spiteful behaviour. First-order fear created the highest intensity of attack. The opposite occurred when there was no reason to strike in the asymmetric treatment.
Simunovic et al. (2013)	58 Japan university students (in the bilateral version)	Preemptive strike	N/A	The majority of participants attacked the other player because of fear of being attacked, rather than the desire to harm others.
Sadrieh and Schröder (2016)	170 German university students	Double-dictator	Women burn more	One-third of players had mixed preference (both giving and destroying money), which was positively associated with payoff comparison. Experimenter demand affected giving, but not destruction.
García-Gallego, Georgantzis, and Ruiz-Martos (2019)	126 Spanish university students	Heaven-dictator	N/A	Playing background music (classical or contemporary pop and rock) had no effect on behaviour.
Abbink and Herrmann (2011)	378 French university students	Collective money-burning	No effect	Inequality aversion did not cause a riot. Disadvantaged groups tended to submit to the advantaged group by performing fewer riots.
Grossman and Komai (2013)	160 American university students	Harm and insurance	Men burn more	Inequality aversion explained money burning and was directed towards those within the same hierarchical group. Spending on insurance was twice as high as spending on harming others.

Notes: MB = money-burning game; JoD = joy-of-destruction game. Given that the essence of the two main games, MB and JoD, is the same (i.e., the willingness to destroy others' payoff), the categorisation between these games was subjectively made based on what the authors stated in their papers. If the authors did not specifically mention which game was used, the game was categorised as JoD if the participants played in pairs or the cost of burning money (if any) was invariable. Otherwise, the game was categorised as MB.

5.3.3 A Meta-analysis

The small yet increasing number of MB and JoD experiments made it possible to undertake a simple meta-analysis of the experimental results.[8] Around 72 per cent of the studies required participants to pay for money burning (the data for this analysis can be found in Appendix A, Table A.7). Figure 5.2a displays a histogram of *burn*, which measures the average burn rate—defined as the percentage of players who chose to burn a portion of their partner's money—across all treatments of the studies. Although the density was small for burn rates higher than 50 per cent, money burning was quite prevalent, with an average of 32 out of 100 participants choosing such behaviour.

In addition, there is a clear pattern whereby *burn* was higher in the studies conducted in European countries and the cost of burning money was associated with antisocial behaviour (Figure 5.2b). The latter indicates that introducing cost increases, rather than decreases, antisocial behaviour. This finding suggests that the participants wanted to maximise every penny they spent by hurting other participants as much as possible—similar to, although not necessarily comparable with, the findings from the spiteful auctions discussed in the introduction of this chapter.

The previous findings were confirmed in the OLS regressions where, following best practice in meta-analysis and a relevant past study (Hedges & Olkin, 2014; Johnson & Mislin, 2011), the error term was weighted by w (the number of subjects in each treatment divided by the total number of observations). Therefore, the specification for the main regression (with *burn* as the burn rate and $\mathbf{X}$ as a vector of explanatory variables) is given by:

$$burn = \beta_1 + \beta_2 \mathbf{X} + \frac{\varepsilon}{w}.$$

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[8]The analysis was 'simple' partially because a large proportion of the studies did not include standard deviations of the observed burn rates. Also, the analysis was limited to results from these two games to minimise variations in the designs of payoff-destruction experiments that could affect the outcome.
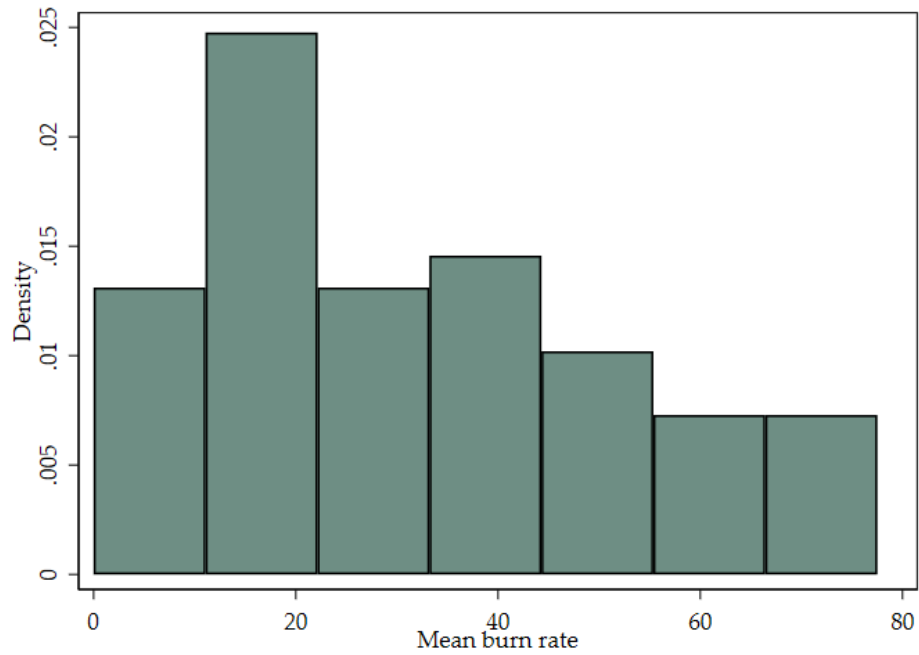
(a) Histogram
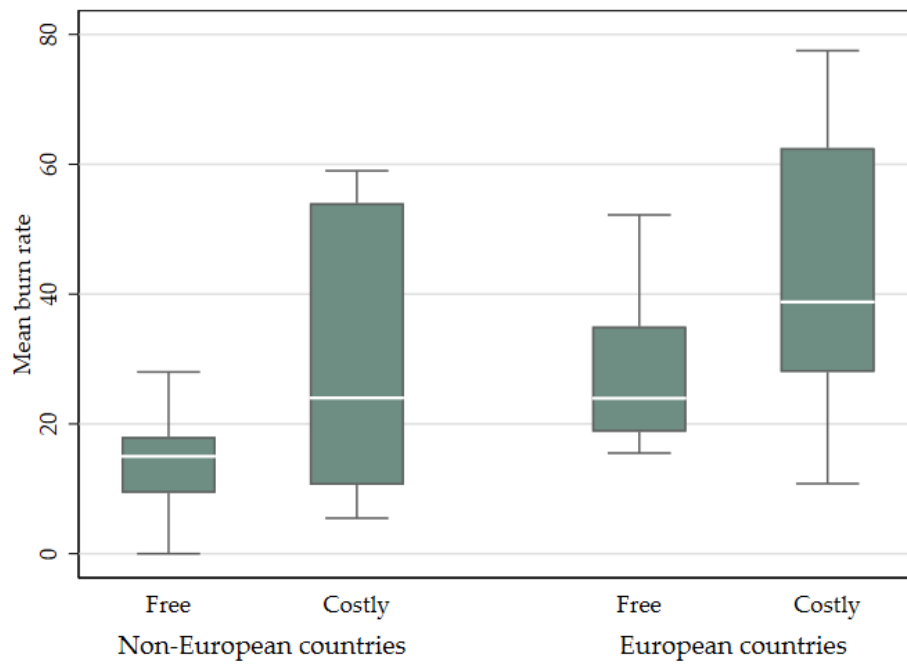
(b) Box plots

Figure 5.2: Distribution and box plots of *burn* in the meta-analysis

Table 5.3: Simple meta-analysis of MB and JoD experiments

	(1)	(2)	(3)	(4)
Costly	18.05***	13.93*	13.96**	5.418
	(4.358)	(7.007)	(6.922)	(6.815)
Students		-4.888	-3.824	-18.50**
		(8.468)	(8.457)	(7.100)
JoD game		-5.447	-3.755	-9.727
		(8.292)	(8.197)	(7.914)
One-shot		13.28	12.34*	9.300*
		(8.093)	(6.705)	(4.887)
Working paper			-12.77***	-6.782
			(3.551)	(4.110)
Region: Africa				-24.46***
				(7.833)
Region: America				-14.85***
				(5.112)
Region: Asia-Oceania				-13.89***
				(4.910)
Constant	20.42***	19.13	20.39	50.15***
	(2.287)	(16.40)	(16.24)	(14.87)
Observations	62	62	62	62
R^2	0.173	0.251	0.311	0.461

Notes: Robust standard errors are in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. Regions are relative to Europe.

Model 1 in Table 5.3 displays the result of the parsimonious model, where costly money burning strongly predicted average money burning across the 62 experimental treatments of MB and JoD games. This finding was consistent when the student dummy, one-shot game dummy and JoD game dummy were included in Model 2. In Model 3, the working papers tended to have lower burn rates, which suggested publication bias, but this effect could be caused by the papers still being developed or in the review process for journal publications.[9] Finally, region dummies absorbed the effect of cost and working papers in Model 4, as *burn* was always lower in sessions conducted outside European countries. Instead, the types of subjects participating in the experiment strongly explained antisocial behaviour: the estimated parameter for experiments conducted with students was negative and significant at five per cent level in this last model. Model 4 was used to predict the burn rates of this thesis's experiments, with the results presented in the next two chapters.

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[9]More than half of the observations (four of the seven working papers) were dated 2018 or 2019.

5.4   The Antecedents of Spite

The previous section summarised the general findings from payoff-destruction experiments and the results from a simple meta-analysis. This section elaborates the findings from the experiments to gain a deeper understanding of the factors that could explain spite. Inequity aversion and pure spite have been found to be the main motivating factors that drive money burning in payoff-destruction games. However, researchers have also identified other drivers of antisocial behaviour, such as emotions, competition, social environments, personal attitudes and beliefs, past experiences, and income and social identity. The following sub-sections examine these six factors in turn.

5.4.1   Emotions

Fear incites a higher intensity of antisocial behaviour when the level of harm is highly devastating. The deactivation rate in the symmetric treatment of the first-strike game (where both participants can deactivate) was 34 per cent (Abbink & de Haan, 2014). This rate was three to four times higher than an equivalent experiment where the level of harm was low (JoD game with open treatment) (Abbink & Herrmann, 2011; Abbink & Sadrieh, 2009), but was still lower than the pre-recorded treatment (co-participant's decisions simulated from a prior experiment) where the burn rate could be as high as 78 per cent. When the deactivation decision was only available to one participant (asymmetric treatment) and fear had no part, no deactivation decision was observed. In stark contrast, the burn rate among participants who did not choose the self-binding mechanism was very high (60 per cent) when they encountered other participants that bound themselves from burning money (Jauernig & Uhl, 2019).[10] This last study, again, emphasises the importance of spite motive in explaining money burning.

Anger was found to have mixed effects on antisocial behaviour and was conditional on exposure to violence in Israel (Zeitzoff, 2014). Specifically, anger was positively (negatively) associated with the decision to destroy one's partner's money in locations with

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[10]This rate was almost double their previous study, where the participants had no option to self-bind (Jauernig et al., 2016).

low (high) exposure to rocket attack. This result could be explained by the formation of beliefs, where experience of violence are conjectured to shape expectations of individuals under certain social situations. In particular, as found in the psychology literature, in-group anger could be positively associated with frustration in the failure of in-groups to respond to an external threat (Maitner, Mackie, & Smith, 2006).

5.4.2 Competitions

Competition drives antisocial behaviour, both in the field and laboratory, and this is more pronounced than the pure spite motive. In two field studies (among rural Namibian pastoralists and Mexican communities) with relatively homogeneous demographics and no experience of group conflict, competition for resources was associated with antisocial behaviour (Basurto et al., 2016; Prediger et al., 2014). Moreover, only seven per cent of participants stated that they had made the payoff-destruction decision due to pleasure in hurting others (Basurto et al., 2016).

Meanwhile, in a laboratory experiment, participants undertook a competition with no financial payoff, where the losers were punished more by winners than by losers, yet winners were equally punished by both (Jauernig et al., 2016). This result implies sympathy among losers after the competition ends.

5.4.3 Social Environments

Antisocial decisions can also be driven by the social environment faced by the participants. For example, social pressure with no financial incentive increases payoff destructions (Karakostas & Zizzo, 2016), while in another study, a sharp increase in the burn rate was observed when participants saw the actual burning behaviour of the preceding participants, which indicates the effect of peers' decisions in spreading such behaviour (Bauer, Cahlíková, Chytilová, & Zelinsky, 2018). Similarly, when participants made money-burning decisions in groups, the burn rate was higher than when decisions were made individually (Bauer, Cahlíková, Celik Katreniak, et al., 2018). Interestingly, retaliation played no part, as indicated by the conditional money burning in the group treatment

that was higher than in the individual treatment, even when co-participants chose not to burn money.

Positive acts such as hugging can also be used to reduce money-burning behaviour, as can displaying pictures of eyes, which suggests social exchange heuristic (Baillon et al., 2013; Diamond & Blackwell, 2017). In contrast, playing music has no mediating effect on antisocial behaviour (García-Gallego et al., 2019).

Meanwhile, external socioeconomic circumstances may have unintentional consequences on antisocial behaviour, as witnessed in the results from a lab-in-the-field experiment in Kenya (Almås et al., 2019). The experiment was not aimed at directly examining the experience of violence, yet political situations (presidential elections) during the study sometimes involved violent demonstrations, which have been argued to affect behaviour. Specifically, relative to participants from different ethnic groups, those sharing the same ethnicity as the winning president seemed unaffected by the treatment (thermal) condition.[11] In addition, participants with a below median score for the cognitive test tended to behave more antisocially. Nonetheless, there was a question of why this result held only with regard to antisocial behaviour and not to the other types of social preferences being investigated (public goods contribution, trust, fairness and donation).

5.4.4   Personal Attitudes and Beliefs

Machiavellianistic behaviour, a measure of individuals' tendency to be cynical and manipulative, has been found to be associated with smaller giving in the dictator game and more money burnt among those who choose to destroy payoffs in the JoD game (L. Zhang & Ortmann, 2016). A low to average score for Machiavellianism (elicited using the Mach-IV test) is also associated with greater trustworthiness in the trust game (Gunnthorsdottir, McCabe, & Smith, 2002).

Religiosity—as measured using questions from Rohrbaugh and Jessor (1975)—is positively associated with antisocial behaviour, which might be because religious participants detest out-group (non-religious) members (J. Zhang et al., 2019). However, priming

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[11]In the thermal condition, participants were seated in a laboratory with a 30°C target temperature, while, in the control group, the target temperature was 22°C.

participants with religious words has no effect on money-burning decisions. This mixed finding supports Hoffmann (2012), who generally found weak or no associations between religion and behaviour in experiments.

Finally, Dickinson and Masclet (2019) used a measure of moral judgement (the trolley problems) to elicit dubious ethical decisions, and found that the willingness to perform such an act predicted spiteful behaviour. However, in viewing the issue from the opposite causal direction, moral judgments are different based on gender, with males more likely to be utilitarian, even after controlling for spiteful behaviour (Bracht & Zylbersztejn, 2018).

5.4.5 Past Experiences of Conflict

Three lab-in-the-field antisocial behaviour experiments involved participants who had experienced violent conflict. In two cases, in India (Islam et al., 2017) and Cambodia (Gangadharan et al., 2017), a higher prior exposure to violence was positively associated with payoff-destruction behaviour, while the opposite was observed in Israel (Zeitzoff, 2014). It is difficult to pinpoint the exact factor that can satisfactorily explain these apparently mixed results, since the types of violence experienced were vastly different. The late 1970s Cambodian genocide was one-sided, with almost no resistance from the victimised groups. The Assam riots in the 1980s were sporadic and involved different groups. The rocket attack against Israeli citizens was much more recent (in the 2000s) and there is the prospect that the conflict will continue. The mixed results in these three studies do not suggest a consensus on how violent conflict affects antisocial behaviour.

The above studies focused on within-community interactions, with no evidence of similar behaviour if paired with people outside the community. A number of cross-cultural studies found out-group bias when participants played a trust game (Chuah, Fahoum, & Hoffmann, 2013; Chuah, Gächter, Hoffmann, & Tan, 2016), and the bias tended to be stronger when the interaction was situated in a competitive context (Sherif, 2015). The following studies aimed to tackle this issue by examining intercommunity interactions. In a study on inter-ethnic hostility, adolescents from the ethnic majority (Slavic) displayed

higher burn rates against the Romani people than against fellow Slavics (Bauer, Cahlíková, Chytilová, & Zelinsky, 2018).[12]   As a background, those from ethnic minority Roma mostly live in poverty and are often the subject of ethnic prejudice and discrimination. This study is the only experiment undertaken to aim to understand how inter-ethnic hostility is associated with spiteful behaviour. However, the study did not ask for actual experiences of hostility, and the observed behaviour cannot be directly linked with this.

In the context of violence attributed to the discovery of a large natural gas reserve and Islamic extremism in rural Mozambique, a religious sensitisation program among young Muslim men has been found to be effective in reducing antisocial behaviour (Vicente & Vilela, 2019). Interestingly, an economic intervention program through entrepreneurship training had no effect on behaviour. There was no out-group discrimination when participants were paired with fellow Mozambicans (Christians or public officials), but the burn rate was higher when they played against a foreigner (American university students). Thus far, only this study and Scacco and Warren (2018) study have systematically investigated the effectiveness of conflict prevention programs for destructive behaviour.

5.4.6   Individual and Social Identity

Low-income individuals tend to behave more antisocially towards those of different income and social groups when the social identity of the other participants is revealed (Gangadharan et al., 2019). Moreover, when low-income participants have no chance of becoming richer, the rate of money burning is increased and aimed at those with high incomes (Gangadharan et al., 2018).

Experimenters have always been interested in understanding the relationship between gender and behaviour.[13]   Of the 38 studies in Table 5.2, 20 included a gender

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[12]Ethnicity was signalled by the list of names of potential co-participants.

[13]There were no systematic differences in altruism levels by gender, but men were generally more trusting than women (Croson & Gneezy, 2009; Sent & van Staveren, 2018). Women were also more sensitive to experimental context, design or social cues, while men were more likely to enter competitions (Flory, Leibbrandt, & List, 2014; Gneezy, Niederle, & Rustichini, 2003; Niederle & Vesterlund, 2007). There are also numerous studies that aimed to observe gender differences in risk-taking, cooperative and punishment behaviour, to name a few. However, critics note that gender differences are usually overstated and that most studies ignore gender beliefs, gender roles, stereotypes and gender identities (Nelson, 2015; Sent & van Staveren, 2018).

variable in the analysis, yet the majority (14) could find no differences by gender. These results do not indicate that the rest of the studies did not collect data on gender; rather, it might be that there was no effect of gender on the observed behaviour or there was no clear mechanism regarding how gender affected behaviour. Either way, gender was excluded from the final versions of the manuscripts.

When the authors found a gender difference, the evidence was mixed. In some cases, women burnt more (Sadrieh & Schröder, 2016; Zeballos, 2018; L. Zhang & Ortmann, 2016), while, in other cases, men burnt more (Almås et al., 2019; Grossman & Komai, 2013; Jauernig et al., 2016). In fact, in one study (Islam et al., 2017), men living in areas that were moderately and heavily affected by past violence tended to be more spiteful; however, in the full sample, women burnt more money. Sample size has also become a problem. Both L. Zhang and Ortmann (2016) and Jauernig et al. (2016) found a gender difference, but only in certain sub-samples: in the truncated data ($n = 31$) and among 'losers' in the in-group condition ($n = 40$), respectively. There were no effects of gender when the full sample was used.

To date, no antisocial behaviour experiment has been specifically designed to observe gender discrimination. However, experiments on social preferences suggest that beliefs, expectations and knowledge of one's co-participant's gender are important factors in predicting discrimination.[14] In addition, there have been some insights regarding gender differences and negative behaviour from the psychology literature.[15]

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[14]In the prosocial literature, Buchan, Croson, and Solnick (2008) used first name as a cue for gender, and found that men were more trusting; however, the amount sent did not differ according to the gender of the responder. In their study, expectation also played a role, where, relative to female participants, the expected amount returned was higher for male participants. Similarly, knowing one's co-participant's gender did not affect trusting behaviour (Bonein & Serra, 2009), but trustees that were paired with trustors of the same gender appeared to be more trustworthy. Using an online trust game, the participants trusted women more than men and, consequently, expected women to be more trustworthy (Garbarino & Slonim, 2009). In contrast, using the standard trust game, subjects selected and sent more to partners of the opposite gender (Slonim & Guillen, 2010). Among men, this discrimination could be explained by the belief that women are more trustworthy, and could also be explained by men's preference for altruism. Among women, expected trustworthiness explained discrimination. In the dictator game literature, Dufwenberg and Muren (2006) found different amounts of money given to men and women (with women given more); however, the amount given did not differ based on the participant's gender. In contrast, Boschini, Dreber, von Essen, Muren, and Ranehill (2018) did not find differential giving based on co-participant's gender.

[15]In a meta-analysis of organisational studies, men reported more counterproductive or deviant behaviour, directed either at organisations or other people, than did women (Berry, Ones, & Sackett, 2007). Gender also mediated anger in predicting counterproductive work behaviour, thereby suggesting that

5.5   Summary

Antisocial or spiteful behaviour can be elicited through spiteful auction or payoff-destruction games, with the latter the focus of this thesis. In these games, participants may reduce other participants' money, but will receive nothing in return. In this chapter, spite has been viewed from three dimensions: (i) behavioural theories, (ii) the way spite is measured and (iii) the antecedents of spite. Among the three categories of other-regarding preferences theories, Abbink and Sadrieh (2009) JoD utility and E. Fehr and Schmidt (1999) utility seem to be the most relevant to the one being studied in this thesis. Over the past two decades, two similar games were introduced, but with two different motivations for money-burning decisions: to reduce inequity (Zizzo & Oswald, 2001) or pure spite (Abbink & Sadrieh, 2009).

Nevertheless, other factors also contribute to antisocial behaviour, such as emotions (e.g., fear), personal attitudes (e.g., Machiavellianism) and competition. Spite can also be explained by experiences of conflict, although the results are mixed. In most cases, previous experiments focused on within-community interactions.

When the studies were aggregated for a meta-analysis, the types of participants and cost of burning money seem to have a strong correlation with average money burning. In particular, the burn rate is higher when burning money is costly; however, when region dummies are included (with burn rates generally lower in non-European countries), experiments conducted in the field with nonstandard subjects strongly predict antisocial behaviour. The findings from this simple analysis can also provide a rough idea of the expected antisocial behaviour from the lab-in-the-field experiments.

Finally, there is a question of whether gender influences antisocial behaviour, whether independently or mediated through another variable. Again, the results are mixed. Also, while the results in the psychology literature show a consistent relationship between gen-

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aggression is acceptable for males, but not for females (Spector & Zhou, 2013). Gender may also be an important determinant of how anger is felt (Astin, Redston, & Campbell, 2003; Litvak, Lerner, Tiedens, & Shonk, 2010), whereby, for men, anger is seen as seizing control, while, for women, anger means a loss of control. Beliefs about gender roles are also argued to explain prosocial behaviour (Eagly, 2009), such as women being thought to be 'communal' (friendly, unselfish and emotionally expressive), while men are thought to be 'agentic' (assertive, competitive and dominant).

der and negative behaviour, the studies are almost exclusively elicited through surveys, rather than experiments. This raises the question of whether participants report the negative behaviour truthfully when there is no direct (monetary) benefit or cost from doing so. This opens a new avenue of research on this topic.

Chapter 6

The Experiment with Indonesian Migrants in Melbourne

This chapter presents the results from an experiment based on payoff-destruction games with a strategy method. Although the experiment was designed in the context of the Aceh conflict, it could also be used to elicit antisocial preferences among the general Indonesian population. The Melbourne experiment was conducted in April 2018 with Indonesian migrants, and served as a pre-test for the Aceh experiment. Given that the participants were less likely to have experienced the Aceh conflict, the observed antisocial decisions should reflect the antisocial behaviour of a more general population. Finally, this study identified the antecedents to such behaviour.

6.1 Introduction

A number of experimental studies have highlighted the importance of conflict experience in explaining prosocial behaviour years after the conflict ended (see the review in Bauer et al., 2016). The Aceh conflict ended in 2005, yet has left a scar on intercommunity relationships, and it remains unknown to what extent the experience of conflict still affects people's behaviour today.

The lab-in-the-field experiment was designed to elicit ethnic and gender discrimination, which has never previously been undertaken in antisocial behaviour studies. Specifi-

cally, the experiment exploited honorific titles in a one-shot payoff-destruction game with a strategy method, where participants made simultaneous decisions against different types of co-participants.

The experiment in this chapter was conducted with Indonesian migrants in Melbourne, where the population was expected to have very low experiences of conflict. The experiment aimed to elicit antisocial preference and identify the factors that drive this behaviour. It was also used as a pre-test for the Aceh field study. Addressing potential implementation problems was expected to be more manageable in Melbourne, since the city has a relatively more predictable environment than Aceh.[1]

Three research questions are asked in this chapter: (1) Do Indonesians generally display spiteful behaviour? (2) If so, does this behaviour discriminate between ethnicity and gender? (3) What are the antecedents of this behaviour? The first and second questions could be answered by observing money-burning decisions against different types of co-participants. The third research question could be answered by correlating money-burning decisions with demographic and personal attitude variables. Moreover, the conduct of the study had practical implications for the fieldwork in Aceh.

The remainder of this chapter examines the subject pool (Section 6.2), methodology (Section 6.3), experimental results (Section 6.4) and robustness checks (Section 6.5), and then presents the conclusion (Section 6.6).

6.2 Indonesian Migrants in Melbourne

According to the 2016 Australian Census, a significant 29 per cent of Indonesian-born residents of Australia were full time students. The relatively good relationship between the two countries, quality of education offered by Australian higher education institutes and close geographical proximity between the two countries have attracted Indonesians to migrate to Australia. This migration was further boosted by the signing of the Indonesia-Australia Comprehensive Economic Partnership Agreement in 2019, which encourages

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[1]In addition, the logistics of undertaking the experiment in Australia were less demanding: while incentivising participants in Australia is significantly more expensive, other operational costs (e.g., return flights to Indonesia) could exceed the savings obtained from incentivising participants in Aceh.
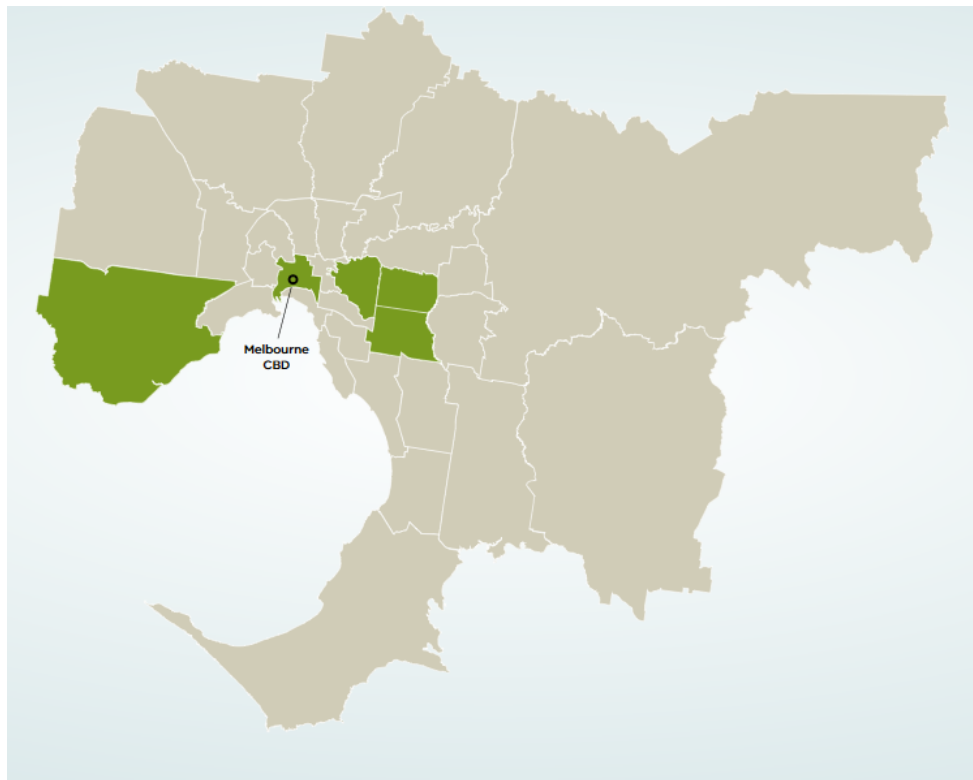
Figure 6.1: Indonesian migrants distribution in the greater Melbourne region

Source: Victoria (2019).

the movement of goods and people across the two countries.

In the greater Melbourne region, migrants are relatively mature, with 45 per cent aged between 30 and 49 years. They are also well educated, with more than half holding higher education degrees. As a comparison, only 10 per cent of the Indonesian population aged 15 and above who had completed higher degree education (BPS, 2019). Moreover, 43 per cent of these individuals arrived in Australia only in recent years (from 2006 onwards). Figure 6.1 displays the geographical distribution of Indonesian migrants in the greater Melbourne region.

There have been no known extended violent conflicts among the Indonesian communities living in Melbourne. In addition, because most migrants were temporary (particularly students), they were expected to integrate with the general population with relative ease compared to migrants from vulnerable groups such as refugees (OECD & European Union, 2018). Together, the subject pool reflected general Indonesians who had never experienced conflict.

6.3 Methodology

6.3.1 Experimental Design

This section describes the antisocial behaviour experiment with a strategy method based on the JoD minigame (Abbink & Herrmann, 2011). In the experiment, participants could pay to destroy a portion of their co-participant's money. The strategy method (Selten, 1967) is commonly used to elicit rare responses, as it requires participants to reveal all of their strategy.[2] The experiment was using the strategy method where participants were asked to make decisions against four different co-participant types, identified by their preferred honorific titles. These titles signalled the participants' gender and ethnicity (Acehnese and Javanese males and females are addressed as *Bang* and *Kak* and *Mas* and *Mbak*, respectively). These titles were expected to be effective in differentiating the participants' ethnicity and gender in a community where the compositions of either ethnic groups (Acehnese or Javanese) were dominant.

The use of honorific titles was essential for a couple of reasons. First, it was necessary to gauge possible in-group or out-group bias due to the past conflict in Aceh. Second, it was necessary to reduce ethnic salience. Using the name of the ethnic groups could create a demand effect and would bias the result through the vividness and salience of ethnic identities (Chuah et al., 2013; Fershtman & Gneezy, 2001). Therefore, one would expect in-group bias if the experiment directly used the names of the ethnic groups, given the past ethnicity-related conflict. For this reason, participants were asked whether they were willing to reduce their co-participant's money if that person identified him/herself as Y— where Y was one of the four titles mentioned above—rather than actually mentioning the ethnic group.[3] From the game-theoretic perspective, experiments with a strategy method and direct elicitation approach should generate similar results (Brandts & Charness, 2011).

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[2]This method is useful in the ultimatum game, where the standard direct elicitation approach only enables experimenters to obtain information regarding the responder's decision, given the proposer's offer. However, when the game is played with strategy method, the experimenters will obtain responses from all possible offers.

[3]If Y was changed to, for example, 'Javanese male', the information on gender and ethnic identity would be too salient and could bias the result. In addition, these titles are commonly used to greet older males/females, whereas younger people are addressed with *Dik* in both Acehnese and Javanese language. This '*Dik*' title was not used in this study.

While behavioural differences occur empirically, the results are more or less consistent (see e.g., Brandts & Charness, 2011; Fischbacher, Gächter, & Quercia, 2012).[4]

In addition to the experiment, several questionnaires were used to shed light on the antecedents of antisocial behaviour. The main survey in the experiment was a self-report war victimisation questionnaire, based on a similar study in Tajikistan (Cassar, Grosjean, & Whitt, 2013). The original questionnaire consisted of eight binary-choice questions on various dimensions of war victimisation: whether the participants or their household members were injured, killed, moved within the country, moved outside the country, lost property, witnessed armed clashes, personally fought in the war, or personally fought in the war after the peace agreement. There were also questions about the regions in which the participants lived during the war. This study used the same set of questions after adjusting for some Aceh-specific characteristics (e.g., moved outside of Aceh, rather than outside of the country, during the conflict). Only those who lived in Aceh between 2000 and 2005 were required to answer questions on war victimisation.

The next question involved (negative) belief elicitation, with participants asked whether they thought their co-participant was willing to reduce their money. Belief regarding one's co-participant's decision has been found to be an important predictor of antisocial behaviour (Abbink & Herrmann, 2011; Prediger et al., 2014). Following procedures in previous experiments, a correct guessing of belief was not incentivised to avoid the potential correlation between behaviour and stated belief (Gächter & Renner, 2010; Prediger et al., 2014).

The social value orientation (SVO) questionnaire is a series of unincentivised allocation tasks based on experimental game theory (van Lange, 2000). There are nine allocation tasks whereby, based on the consistencies in choices that participants make, the participants can be grouped into one of the four categories (prosocial, individualistic, competitive and other/unknown). This survey has been used in many psychological experiments and has appeared in some economic experiments (Boone, Declerck, & Kiyonari,

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[4]Critics of the strategy method argue that decision makers face different information sets than when playing with direct elicitation method (Chen & Schonger, 2017). However, because the use of the strategy method in this experiment was simply for practical purposes and not to analyse very rare events or compare the results from the two methods, it is argued that the benefits outweighed the costs.

2010; Emonds, Declerck, Boone, Vandervliet, & Parizel, 2011; Polonio & Coricelli, 2019).

This study also employed four personal attitude questionnaires. In the following paragraphs, each of the questionnaires is briefly described, and interested readers may refer to Appendix D for the lists of questions. First, the Mach-IV test measures Machiavellianism, such as being cynical and manipulative (Christie, Geis, Festinger, & Schachter, 1970). The 20-item test is very popular among psychologists and has been used in several economic experiments (see e.g., Gunnthorsdottir et al., 2002; L. Zhang & Ortmann, 2016). This test was employed partly because its results could be compared with a previous antisocial behaviour experiment that also used the same instrument (L. Zhang & Ortmann, 2016).

Second, the Buss-Perry Aggression Questionnaire is an established, self-reported aggression survey that can be broken down into four sub-traits (physical aggression, verbal aggression, anger and hostility). Of these sub-traits, anger is thought to be the 'psychological bridge between the instrumental components [physical and verbal aggression] and the cognitive component [hostility]' (Buss & Perry, 1992, p. 457). Thus, anger unites various aspects of aggressive behaviour. The questionnaire is influential in psychology and has been used by economists in a number of experiments (Kugler, Neeman, & Vulkan, 2014; van Veldhuizen, 2013).

Third, the questionnaire on religiosity consists of eight questions that can be broken down into four dimensions (Rohrbaugh & Jessor, 1975): ritual, consequential, experiential and ideological.[5] This instrument has also been used in economic experiments (e.g., Chuah et al., 2016; Chuah, Hoffmann, Ramasamy, & Tan, 2014) and it is expected that religiosity has at least some degree of negative association with spite.[6] The survey is reliable across major religions in the world (Hill & Hood, 1999), including Islam. The Indonesian 2010 population census estimated that 98 per cent of the Aceh population are Muslim.

Finally, a set of questions on religious fundamentalism were asked. The 12-item

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[5]The ritual dimension is related to the commitment to religious practices such as frequency of praying. The consequential dimension is associated with the belief that a person's behaviour is to some degree correlated with religious teaching. The experiential dimension is linked with mystical experience. The ideological dimension is associated with the fundamental belief of a religion.

[6]See Hoffmann (2012) for a review on the role of religion in economic experiments.

instrument was a revision of the original 20-item scale that measures respondents' belief about whether there is a set of religious teachings that are true, are fundamental and must be followed (Altemeyer & Hunsberger, 2004). Similar to Rohrbaugh and Jessor (1975), this scale is applicable to major religions and has also been used in economic experiments.

6.3.2   Ethical Challenges in the Data Collection

This sub-section briefly discusses the ethical challenges of the data collection. The main experiment was conducted in post-conflict Aceh and some risks were identified before the fieldwork proceeded in 2017.[7] First, animosity could arise from the decision-making task. By design, the experiment was anonymous, and participants were only identified by their participant number (which was destroyed at the end of each session). In the field, social tension could arise because the game involved people reducing others' money, and the participants were most likely not strangers. Second, some participants could feel upset by the differential payment. Third, answering items relating to the experience of conflict could cause distress. Fourth, the war victimisation questionnaire specifically asked whether the participants were personally involved in armed clashes, which could be used to incriminate them. In response to the potential risks, five measures were implemented in the experiments, in addition to the standard conduct of economic experiments (e.g., anonymous response, right to withdraw and private payment). Almost all of these measures were also implemented in the Melbourne experiment, as it was employed as a pre-test of the Aceh study.

First, computerised co-participants were included to create a layer of uncertainty regarding whether humans or computers made the money-burning decision, if any. Theoretically, the introduction of computerised co-participants should not make any difference, as a rationally motivated participant should never make a money-reduction decision at all. The computer was included in the Melbourne experiment and was programmed to make the same decision as a human co-participant (i.e., to reduce their co-participant's money or not), except that the decisions were made randomly. Later, the computer was

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[7]Risk is defined as 'a potential for harm, discomfort or inconvenience' (The National Health and Medical Research Council, The Australian Research Council, & Universities Australia, 2018, p. 12).

removed from the Aceh experiment, as the fear of distressed participants was unfounded following the completion of the Melbourne experiment.

Second, co-participants were positioned in a distant location. In the worst case that participants become angry about having their money reduced, the cost of finding and physically travelling to the other location was prohibitively high. In the Aceh experiment, the distance was at least 50 km and in a different district. In the Melbourne experiment, the distance varied from 4.5 to 37 km.

Third, the experiment was designed to minimise potential upset by: (i) limiting the implementation of money-burning decisions (only one decision, rather than both decisions, in a pair that was implemented) by tossing a coin, (ii) capping the amount of money that could be reduced (only 40 per cent of the co-participant's money could be destroyed), and (iii) concealing the matching (participants never received any information about the social identity of the co-participant with whom they were matched).

Fourth, the addresses of primary health clinics were provided in the consent form in the Aceh experiment to provide psychological support. Participants who had a health card (for the universal health coverage program that every Indonesian citizen must have) were entitled to free health services.[8]

Fifth, a debriefing document was provided at the end of each experimental session, which explained the objective of the experiment, as well as the general results from other similar studies. Further, after six months, short reports written in layperson's language were sent to the heads of the villages where the experiments were conducted in Aceh.

Finally, while not a measure to specifically tackle the risks, incrimination was not an issue because the Aceh Peace Treaty (Sections 3.1. and 3.2. of the Helsinki Memorandum) contains a general amnesty for conflict participants that is honoured by the Indonesian government.[9] A research recommendation letter was also granted by the Aceh government, which formally allowed this study to be conducted in the region.

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[8]In the event that participants did not have a health card, the research assistants were expected to provide the necessary support to obtain the card or help them access counselling services.

[9]In fact, many of the current district leaders were ex-rebels, as the national government provides the opportunity for local parties to compete in Aceh elections.

6.3.3   Implementation

There were three phases during each of the sessions.

Phase 1. After registration, the participants were seated alone to ensure privacy and avoid collusion. After signing the consent form, the participants could start filling in the demographic characteristics questionnaire, which included their preferred honorific titles. Once all participants had completed the demographic survey, the experimenter started reading the decision-making task instruction sheet. The forms for the Melbourne experiment can be seen in Appendix C.

Phase 2. Each participant received an equal amount of endowment (AUD 25) and was then asked to make decisions about whether they were willing (or not) to reduce their co-participant's money, based on their honorific title. The cost of burning AUD 10 of the co-participant's money was AUD 1. For example:

> *If my co-participant most identifies with the title of* mas, *my decision is (tick one)*:
>
> ☐   *to leave their money as it is and not have to pay*
>
> ☐   *to reduce their money by AUD 10 and pay AUD 1*

In addition to the four types of (human) co-participants, the participants were also asked to make a decision against the computer co-participant that was programmed to make random decisions. Therefore, in total, each participant made five money-burning decisions: four against human co-participants identified by their chosen honorific titles and one against the computer co-participant.

Before making any decisions, the participants were asked to answer some comprehension questions, and the experimenters were instructed to explain the answer for each of them. The participants were also clearly informed that they must be able to answer all questions before starting the decision tasks. After making their decisions, only the decision made by one of the participants in each pair was implemented, based on a coin toss in one of the experimental locations. Therefore, knowledge about whether they were a decision maker or not did not affect the participants' decisions in the experiment. This procedure was similar to the one used in Zizzo (2003).

Phase 3. After the decision task, the participants were asked to answer questions on conflict experience, negative belief, SVO and personal attitudes. The participants were paid a flat fee of AUD 15 for completing the questionnaire. After answering all the questions, they were directed to the adjacent room for private payment and were allowed to leave the experimental location. The applicable decision given the co-participant's actual title was used to determine earnings.

To avoid potentially resurfaced tensions between the two ethnic groups in Aceh, two teams of experimenters/research assistants (RAs) were assigned to two (distant) locations and sessions were held simultaneously. The two locations for each experimental session were separated by as far as 37 km, which is equivalent to a one-hour drive. This was made known to the participants. This approach was also implemented in the Melbourne study to mimic the Aceh study. In each location, one of the RAs read the instructions, while the other RA communicated (by telephone and in a separate room) with the first RA to randomly match the participants.

This experimental design enabled elicitation of antisocial behaviour between the two ethnic groups (Acehnese and Javanese). Therefore, it could be used to elicit ethnic and gender discrimination, provided there was a large proportion of the population from either ethnic group. Given that Javanese is the majority ethnic group (40 per cent of the Indonesian population), it was safe to assume that the demographic composition of the Indonesian migrant community in Melbourne would not be much different.

Recruitment posters were placed in public areas that are known to cater to the Indonesian community (e.g., Indonesian restaurants) and distributed via social media and messaging apps. There was no time limitation for the experiment, but the recruitment poster specified that the whole session would last for approximately two hours. The participants needed to be at least 25 years old to match with the recruitment requirements in Aceh. All sessions were conducted in either a community hall or lecture room. Community halls—located in suburbs with large Indonesian communities—were chosen to attract general (non-student) participants, while lecture rooms were used to entice students to participate in the study. Therefore, the participants could attend whichever

location suited their preference.

Six Indonesian graduate students helped as RAs. Four pilot sessions were conducted in September 2017. The participants who attended the pilot sessions were not allowed to participate in the real sessions, but some were recruited as RAs instead. All materials (written in formal Indonesian language) were identical, except when describing the coin toss. The whole sessions were held with pen and paper.

6.4   Results

The previous section elaborated the experimental design, implementation and ethical challenges and responses. This section presents the results from the experiment in Melbourne, where a total of 127 Indonesian participants completed the sessions conducted on October 2017.

Table 6.1 displays the summary statistics. The average age of participants was 32 years, and female participation was lower than male participation, at 46 per cent. Importantly, half of the participants identified themselves as Javanese, which well complemented the experimental design. There were three Acehnese participants in the sample, but their decisions cannot possibly represent the larger Acehnese community.

Table 6.1: Summary statistics, Melbourne

Variable	Obs.	Mean	Std dev.	Min.	Max.
Burn any types of co-participant money	127	0.26	0.44	0	1
Burn at least one human co-participant's money	127	0.16	0.37	0	1
Burn only human co-participant's money	127	0.06	0.24	0	1
Burn only computer co-participant's money	127	0.09	0.29	0	1
Count any burning decision	127	0.54	1.10	0	5
Count any burning decision (except computer)	127	0.35	0.88	0	4
Negative belief	127	0.20	0.40	0	1
Female	127	0.46	0.50	0	1
Age	127	31.75	5.91	25	50
Javanese	127	0.50	0.50	0	1
Muslim	127	0.77	0.42	0	1
Married	127	0.63	0.48	0	1
Income >AUD 2,000	125	0.53	0.50	0	1

6.4.1 Patterns of Antisocial Behaviour

This study sought to determine whether spiteful behaviour was observed among general Indonesians and, if so, whether the participants discriminated between ethnicity and gender. The results indicated that around one in four participants were willing to reduce their co-participant's money, despite the cost of doing so (first row in Table 6.1).[10] This rate is almost equal to the prediction from the meta-analysis regression in the previous chapter (Model 4 in Table 5.3), where the model predicted an average of 26 per cent burn rate, but with large intervals (12 to 40 per cent).[11]

There was no differential burning behaviour by gender or ethnicity, as indicated by the Mann-Whitney tests, which could not reject the null of equal distributions (Table 6.2). When only money-burning decisions against a human co-participant were used, a two-sample parametric test of proportions by gender yielded a p-value of 0.1071,[12] meaning that males were somewhat more likely to burn money than were females. Nonetheless, calculating the index of similarity (Sent & van Staveren, 2018) when counting burning decisions by gender, with and without the computer co-participant, resulted in the values of 0.93 and 0.91, respectively, which indicated an almost complete overlap in the distributions of burning decisions.[13]

Result 1: No differential antisocial behaviour was found by ethnicity or gender.

When only considering decisions against human co-participants, the ratio dropped to only 16 per cent (including burning both humans' and the computer's money). This burn rate was higher than in Abbink and Herrmann (2011) open treatment (10 per cent), yet lower than the prediction from the meta-analysis (26 per cent). When only antisocial decisions against humans were considered (i.e., those who never burnt the computer's

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[10]Given the lack of specific ethnicity-gender combinations of interest (e.g., whether Javanese males tend to be more spiteful against non-Javanese females), the following analyses used a simpler categorisation of burning decisions with regard to (co-)participants' gender or ethnicity. For example, the variable 'female partner' identified decisions against co-participants with (preferred) female honorifics (*Mbak* or *Kak*)— similarly for 'Javanese partner' (*Mas* or *Mbak*). In addition, as will be seen later, using honorifics (plus the computer) as control variables did not change the results.

[11]To estimate the predicted value for the burn rate, averages were used for a working paper dummy and student dummy, as it was expected that a significant proportion of the participants would be (post-graduate) students.

[12]With the null hypothesis of no difference and alternative hypothesis of positive difference, where the difference was defined as the proportion of burning by males minus the proportion of burning by females.

[13]An index equal to 1 meant that the two groups' distributions were identical.

Table 6.2: Mean burning decision by gender and ethnicity

	Gender			Ethnicity		
	Male	Female	p-value	Javanese	Non-Javanese	p-value
Full sample	0.290	0.224	0.402	0.266	0.254	0.881
Excluding computer	0.203	0.121	0.216	0.141	0.190	0.451

Notes: The p-values are from the Mann-Whitney test for difference by gender or ethnicity.

money), the burn rate dropped even lower to six per cent. In contrast, the burn rate was higher (nine per cent) when counting antisocial decisions only against the computer (i.e., the participants never reduced the human co-participant's money).

Such a large proportion of antisocial decisions against the computer was unexpected, as it was introduced simply as a means to avoid upset—that is, in instances in which people had their money destroyed, there was the probability that it was caused by the computer and not a human. It could be that the participants did not understand the instructions, but there was a mandatory comprehension quiz before the decision-making task. It could also be that the cost of burning was too low; however, money burning was costless in the original JoD experiment and there were pilot sessions to calibrate the cost.

Nevertheless, when the participants chose to burn, most of them only burnt once, and the proportion decreased with a larger number of burning decisions, except when the burn count excluded decisions against the computer co-participant (Figure 6.2). Importantly, there was also no differential antisocial behaviour against gender or ethnic out-group members (Figure 6.3), although those from ethnic Javanese tended to burn non-Javanese co-participants slightly more often (Wilcoxon's two-sided p-value = 0.317). The indifferent antisocial behaviour was as expected, as there are no indications of conflict along ethnic lines among Indonesians in Melbourne. Similar results were found with regard to conflict among different genders (there were none).

Result 2: No discrimination was found by ethnicity or gender.

Irrespective of the participant's own gender, males were targeted more than females and the differences were statistically significant, as shown in the left panel of Figure 6.3. The Wilcoxon test for matched sample gave the p-value of 0.025 (0.096) for differential antisocial decisions among females (males).
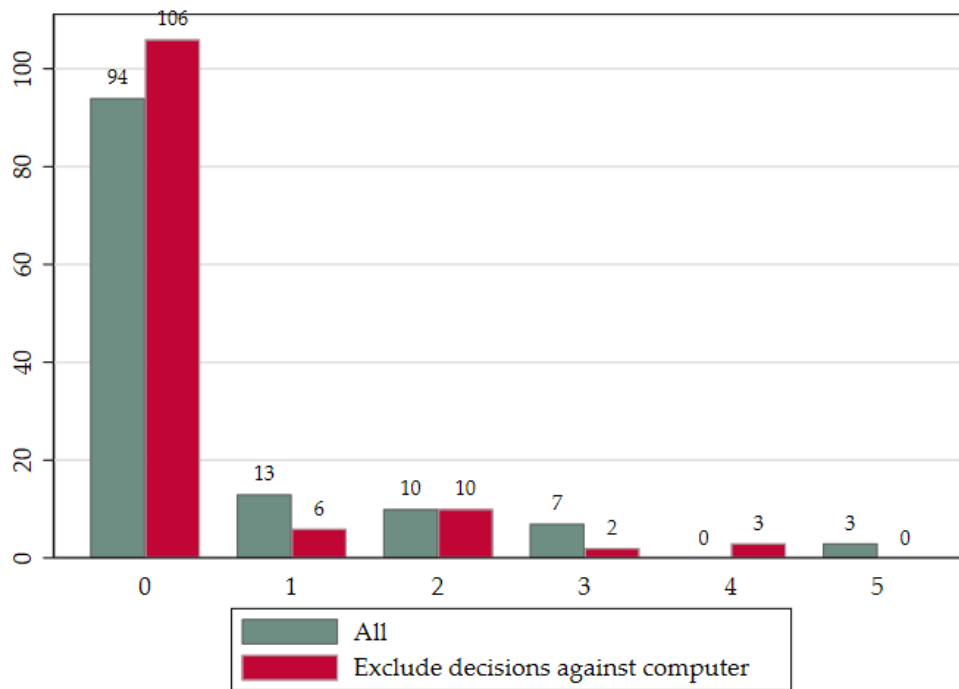
Figure 6.2: Count burning decisions
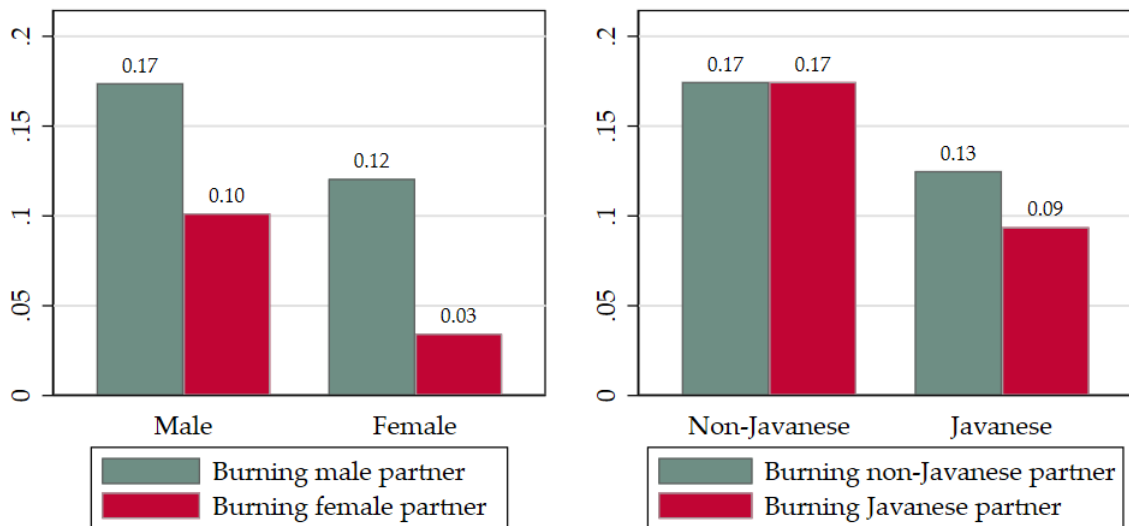
Figure 6.3: Share of money-burning decisions by ethnicity and gender

Notes: Excluding the computer co-participant.

Table 6.3: Antisocial behaviour, personal attitudes and beliefs; Melbourne

	All	Male	Female
Religiosity	0.8676	0.4122	0.2375
Religiosity: ritual	0.7437	0.9658	0.6059
Religiosity: consequential	0.9543	0.3923	0.2507
Religiosity: ideological	0.4205	1.0000	0.1569
Religiosity: experiential	0.5509	0.1818	0.3401
Religious fundamentalism	0.6483	0.7989	0.4354
Mach-IV	0.7070	0.4386	0.2213
Aggression	0.6184	0.6657	0.8017
Aggression: anger	0.1463	0.5411	0.0836*
Aggression: hostility	0.8883	0.5915	0.4842
Aggression: physical	0.8198	0.8214	0.9883
Aggression: verbal	0.3973	0.7413	0.2771

Note: The numbers are p-values from the Mann-Whitney test for unmatched data (by money burning decision; i.e., destroy the money of at least one human co-participant). $*p < 0.10$.

Result 3: Females were less likely to have their money destroyed when decisions against the computer co-participant were excluded.

This study also employed various measures of personal attitudes and beliefs to seek the antecedents of antisocial behaviour. The majority of participants had prosocial tendency (as elicited using SVO) and their burn rate (burn at least one human co-participant's money) was only 14 per cent—much lower than those in the individualistic (22 per cent) or other/unknown (57 per cent) categories. However, this finding was limited by the small sample (16 observations) of those outside the prosocial category.

The statistical tests between money burning and personal attitudes and beliefs only suggested anger as having the potential to explain antisocial behaviour (Table 6.3). Moreover, it seems that the effect of anger operated differently by gender. Figure 6.4 graphs the mean score for anger and burning decisions to provide a better visualisation of this finding. There was a significant difference by gender at 10 per cent level among those who chose to burn (Mann-Whitney p-value = 0.08), with females tending to have higher scores for anger. When the data were broken down by the number of burning decisions, it was apparent that the difference was driven by those who burnt three to four times (see Table A.8 in the appendix).

Result 4: Females that chose to burn tended to have higher scores of anger than did males.
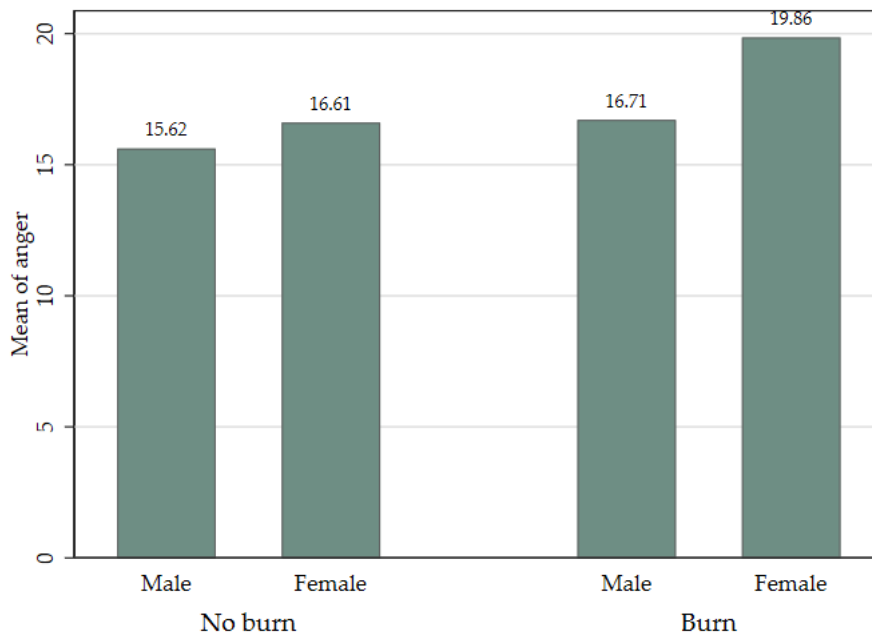
Figure 6.4: Mean score of anger by antisocial decisions and gender

Finally, expectation (of having one's money destroyed) was an important indicator of money burning in the original design of this experiment (Abbink & Herrmann, 2011). In this study, the burn rate for participants who thought they would be burnt (negative belief) was 50 per cent—more than twice the rate of those who did not have such negative expectations (20 per cent). This was confirmed by the Mann-Whitney test, which yielded a p-value < 0.01.

Result 5: Negative belief strongly predicted spiteful behaviour.

Next, regressions were used to test the consistency of these results.

6.4.2 Regression Results

Panel probit regressions indicated that the five results held even after controlling for various covariates. Burning decisions were strongly correlated by the types of co-participant (see Table 6.4). When facing the computer (Models 1 to 3), the probability of antisocial decisions against such a co-participant was higher than when facing a human. When only decisions against human co-participants were considered (Models 4 to 6), participants tended to be less antisocial when facing female co-participants. In addition, in Models 2 to 6, negative belief was strongly associated with a higher and lower likelihood of antiso-

cial behaviour, respectively. Also, in all cases, students tended to behave more rationally and selfishly than did non-students by not burning money.

There was no observed ethnic or gender discrimination, as indicated by the insignificant estimated parameter for the interaction terms (Models 5 and 6), although the negative signs were pointing in the correct direction. This finding did not change when preferred honorific titles were used instead of the partner's gender or ethnicity (results not shown).

Table 6.5 displays how anger was associated with antisocial behaviour. In the first and second models, anger was slightly correlated with antisocial behaviour, but adding an interaction between gender and anger (Model 3) resulted in the loss of significance of anger. However, when decisions against the computer partner data were excluded, adding the interaction term resulted in a highly significant correlation with burning decision (Models 4 and 5). This suggests that the finding was not driven by decisions against the computer co-participant. Figure 6.5 displays the predicted probabilities of antisocial decisions from Model 5. In the last two models, regressing Model 4 by the gender sub-samples confirmed the positive association between anger and antisocial behaviour among females.

However, this result was sensitive to the choice of the method to calculate the standard errors. When bootstrapping was used for Model 5 (with 1,000 repetitions), the p-values for gender and the interaction term dropped from 0.006 and 0.016 to 0.137 and 0.164, respectively (results not shown). The estimated parameter for the female partner variable was also weakly significant, with a p-value of 0.108. Only the effects of negative belief and student variables were unchanged.

Table 6.4: Main regressions, Melbourne (dependent variable: burning decision)

	(1)	(2)	(3)	(4)	(5)	(6)
Female partner	-1.501***	-1.488***		-0.971**	-0.773*	-0.971**
	(0.310)	(0.307)		(0.401)	(0.453)	(0.401)
Male partner	-0.680**	-0.666**		(base)	(base)	(base)
	(0.294)	(0.280)				
Javanese partner			-1.009***	-0.135	-0.130	-0.108
			(0.269)	(0.178)	(0.181)	(0.185)
Non-Javanese partner			-0.921***	(base)	(base)	(base)
			(0.238)			
Female		-0.422	-0.395	-0.665	-0.522	-0.666
		(0.382)	(0.363)	(0.542)	(0.610)	(0.542)
Javanese		0.0376	0.0264	-0.325	-0.317	-0.298
		(0.398)	(0.377)	(0.546)	(0.554)	(0.579)
Negative belief		1.685***	1.588***	2.396***	2.432***	2.396***
		(0.445)	(0.420)	(0.664)	(0.671)	(0.664)
Age		0.00817	0.00809	0.0313	0.0293	0.0313
		(0.0379)	(0.0357)	(0.0504)	(0.0510)	(0.0503)
Muslim		-0.355	-0.329	-0.0575	-0.0471	-0.0577
		(0.426)	(0.401)	(0.523)	(0.526)	(0.523)
Married		-0.580	-0.540	-1.061	-1.062	-1.062
		(0.482)	(0.456)	(0.736)	(0.751)	(0.735)
Income >AUD 2,000		0.0776	0.0682	0.188	0.185	0.187
		(0.383)	(0.363)	(0.558)	(0.568)	(0.557)
Student		-1.148***	-1.084***	-1.761***	-1.796***	-1.760***
		(0.427)	(0.404)	(0.646)	(0.654)	(0.646)
Female × female partner					-0.615	
					(0.825)	
Javanese × Javanese partner						-0.0598
						(0.376)
Constant	-1.737***	-0.485	-0.494	-1.646	-1.679	-1.659
	(0.366)	(1.320)	(1.241)	(1.656)	(1.664)	(1.634)
$\ln(\hat{\sigma_v}^2)$	1.134***	0.525	0.391	0.885*	0.934*	0.884*
	(0.381)	(0.374)	(0.362)	(0.505)	(0.532)	(0.506)
Sample	All	All	All	Exclude computer partner	Exclude computer partner	Exclude computer partner
Observations	635	625	625	500	500	500
Number of id	127	125	125	125	125	125

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. In (1) to (3) partner was relative to computer co-participant.

Table 6.5: Panel regression on the role of anger (dependent variable: burning decision)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female partner	-1.448***	-1.440***	-1.434***	-0.972**	-0.972**	-0.675*	-1.773
	(0.300)	(0.298)	(0.295)	(0.404)	(0.405)	(0.406)	(1.086)
Male partner	-0.626**	-0.623**	-0.622**	(base)	(base)	(base)	(base)
	(0.283)	(0.277)	(0.272)				
Javanese partner	-0.103	-0.0995	-0.0983	-0.132	-0.131	-0.166	0.0481
	(0.143)	(0.143)	(0.142)	(0.180)	(0.180)	(0.212)	(0.326)
Female	-0.454	-0.581	-2.960*	-0.904*	-6.877***		
	(0.371)	(0.362)	(1.782)	(0.523)	(2.514)		
Anger	0.0853*	0.0987**	0.0467	0.138**	0.0333	0.0135	0.578*
	(0.0448)	(0.0425)	(0.0422)	(0.0577)	(0.0564)	(0.0435)	(0.304)
Female × anger			0.138		0.337**		
			(0.0979)		(0.136)		
Negative belief	1.823***	1.772***	1.846***	2.575***	2.855***	2.323***	3.719
	(0.472)	(0.435)	(0.424)	(0.667)	(0.684)	(0.601)	(2.333)
Javanese		0.125	-0.0858	-0.106	-0.563	-0.391	-1.178
		(0.390)	(0.367)	(0.556)	(0.565)	(0.560)	(1.539)
Age		-0.000640	0.0120	0.0183	0.0484	0.100**	-0.0305
		(0.0348)	(0.0331)	(0.0473)	(0.0450)	(0.0485)	(0.125)
Muslim		-0.443	-0.289	-0.226	0.125	-0.0526	
		(0.425)	(0.383)	(0.563)	(0.494)	(0.448)	
Married		-0.674	-0.730*	-1.184*	-1.278**	-1.503***	-0.178
		(0.447)	(0.421)	(0.680)	(0.614)	(0.574)	(1.418)
Income >AUD 2,000		-0.0433	-0.0912	0.0435	-0.0332	0.122	-1.663
		(0.348)	(0.334)	(0.527)	(0.497)	(0.420)	(1.571)
Student		-1.270***	-1.166***	-2.074***	-1.873***	-1.345**	-1.057
		(0.433)	(0.392)	(0.657)	(0.607)	(0.614)	(1.710)
Constant	-3.167***	-1.541	-1.087	-3.132	-2.429	-3.557*	-11.82
	(0.874)	(1.428)	(1.400)	(1.947)	(1.860)	(1.880)	(7.200)
$\ln(\hat{\sigma}_v^2)$	0.667*	0.406	0.288	0.794	0.600	-0.320	1.568*
	(0.386)	(0.394)	(0.392)	(0.525)	(0.521)	(0.806)	(0.945)
Sample	All	All	All	Exclude computer partner	Exclude computer partner	Male & Exclude computer partner	Female & Exclude computer partner
Observations	635	625	625	500	500	276	180
Number of id	127	125	125	125	125	69	45

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. Partner ethnic was relative to non-Javanese. In (1) to (3), partner gender was relative to the computer co-participant. Religion (Muslim) was dropped from (7) because of collinearity.
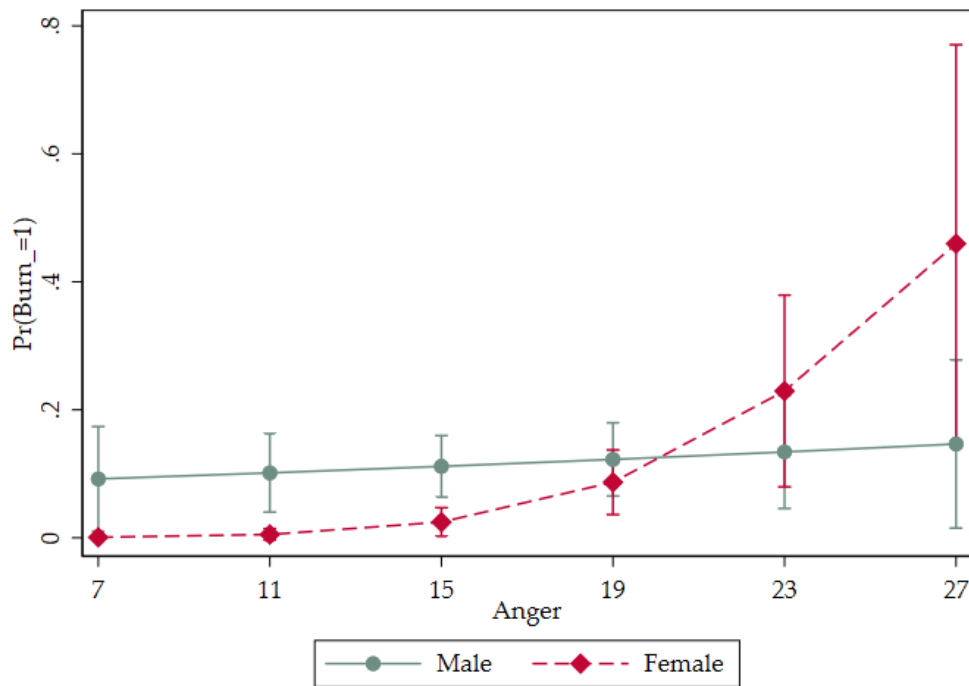
Figure 6.5: Predicted probability of burning decision with 95 per cent confidence intervals

Notes: The prediction was based on Model 5 in Table 6.5.

The differential gender effect of anger on antisocial behaviour was more pronounced when the dependent variable was the count of antisocial decisions. Using Poisson regression, Table 6.6 indicates that, even when the data included decisions against the computer, the interaction between gender and anger yielded positive and statistically significant coefficients at least at five per cent level (Models 2 to 4). In these regressions, females burnt less, yet females with a high score of anger burnt more. Bootstrapping the standard errors (with 1,000 repetitions) in Model 3 did not change the results, with p-value = 0.075 for the interaction term and 0.050 for gender (results not shown). In addition, in the regressions by gender, the estimated parameter for anger was significant at one per cent level for females.

Table 6.6: Poisson regression on the role of anger (dependent variable: count burning decision)

	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.415	-3.852***	-3.590***	-4.869***		
	(0.337)	(1.449)	(1.382)	(1.506)		
Anger	0.0579	0.00825	0.0429	0.0417	0.0372	0.345***
	(0.0442)	(0.0483)	(0.0358)	(0.0489)	(0.0474)	(0.113)
Female × anger		0.195**	0.178**	0.253***		
		(0.0772)	(0.0756)	(0.0813)		
Negative belief	1.614***	1.773***	1.905***	2.488***	2.434***	2.558***
	(0.311)	(0.320)	(0.302)	(0.418)	(0.575)	(0.967)
Javanese			-0.246	-0.671	-0.391	-0.852
			(0.356)	(0.525)	(0.658)	(0.808)
Age			0.0230	0.0332	0.116	-0.0268
			(0.0306)	(0.0433)	(0.0708)	(0.0852)
Muslim			-0.221	0.0305	-0.259	15.61***
			(0.370)	(0.492)	(0.578)	(0.987)
Married			-0.460	-0.599*	-1.018*	-0.000178
			(0.295)	(0.354)	(0.549)	(0.570)
Income >AUD 2,000			0.220	0.369	0.580	-0.640
			(0.303)	(0.417)	(0.425)	(0.963)
Student			-1.102***	-1.493***	-0.950*	-0.670
			(0.295)	(0.410)	(0.549)	(0.974)
Constant	-1.998**	-1.269	-1.415	-2.336	-5.090	-22.23***
	(0.831)	(0.781)	(1.315)	(1.939)	(3.135)	(3.714)
Sample	All	All	All	Exclude computer partner	Male & Exclude computer partner	Female & Exclude computer partner
Observations	127	127	125	125	69	56

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. Poisson model was used because there was no indication of over-dispersion in the data.

6.5 Robustness Checks

This section checked for alternative mechanisms that could explain the results: the effects of personal attitudes and beliefs, a mismatch between honorific titles and actual gender/ethnicity, other sub-traits of aggression and artefact interaction effects. In the following regressions, decisions against the computer were excluded unless indicated otherwise.

6.5.1 Personal Attitudes and Beliefs

Table 6.7 summarises the regression results that added several measures of personal attitudes and beliefs. Religiosity and Machiavellianism, in particular, have been found to be correlated with antisocial behaviour in experiments (see Section 5.4).

The inclusion of these variables did not change the sign or significance of the interaction term between anger and gender (Models 1, 3 and 5). In addition, these variables and their interactions with gender did not seem to have important associations with money burning (Models 2 and 6), except regarding religiosity (Model 4), where the results are mixed. Religiosity was positively associated with antisocial behaviour, but the effect was mediated by gender (religious females tended to behave less antisocially).

Table 6.7: Panel regression on the role of personal attitudes (dependent variable: burning decision)

	(1)	(2)	(3)	(4)	(5)	(6)
Female partner	-0.971**	-0.970**	-0.975**	-0.963**	-0.972**	-0.976**
	(0.405)	(0.400)	(0.406)	(0.404)	(0.405)	(0.404)
Javanese partner	-0.132	-0.133	-0.132	-0.131	-0.130	-0.130
	(0.179)	(0.178)	(0.180)	(0.180)	(0.180)	(0.179)
Female	-6.897***	4.421	-6.785***	14.90**	-6.876***	-1.618**
	(2.486)	(3.150)	(2.454)	(6.563)	(2.530)	(0.759)
Anger	0.0411	0.140**	0.0366	0.146**	0.0334	0.148**
	(0.0596)	(0.0602)	(0.0539)	(0.0600)	(0.0564)	(0.0588)
Female × anger	0.337**		0.337**		0.337**	
	(0.134)		(0.135)		(0.140)	
Machiavellianism	-0.0170	0.0279				
	(0.0350)	(0.0281)				
Female × Machiavellianism		-0.121				
		(0.0739)				
Religiosity			0.0588	0.325*		
			(0.0836)	(0.175)		
Female × religiosity				-0.437**		
				(0.179)		
Religious fundamentalism					-0.000254	-0.0162
					(0.0123)	(0.0157)
Female × religious fundamentalism						0.0323
						(0.0276)
Negative belief	2.853***	2.501***	2.864***	2.653***	2.855***	2.570***
	(0.679)	(0.641)	(0.674)	(0.699)	(0.686)	(0.658)
Javanese	-0.555	-0.0247	-0.568	-0.398	-0.563	-0.0723
	(0.566)	(0.544)	(0.569)	(0.532)	(0.559)	(0.550)
Age	0.0433	0.00463	0.0415	0.00533	0.0485	0.0337
	(0.0449)	(0.0471)	(0.0453)	(0.0439)	(0.0447)	(0.0505)
Muslim	0.131	-0.219	0.0215	-0.495	0.131	0.0102
	(0.515)	(0.556)	(0.518)	(0.567)	(0.558)	(0.635)
Married	-1.253**	-1.190*	-1.300**	-1.416**	-1.277**	-1.120*
	(0.609)	(0.695)	(0.622)	(0.681)	(0.622)	(0.672)
Income >AUD 2,000	-0.0544	0.0731	-0.0181	0.0721	-0.0335	0.00732
	(0.506)	(0.531)	(0.492)	(0.489)	(0.494)	(0.523)
Student	-1.830***	-1.983***	-1.861***	-2.093***	-1.873***	-2.059***
	(0.619)	(0.632)	(0.600)	(0.667)	(0.603)	(0.651)
Constant	-1.672	-3.998*	-4.313	-14.17**	-2.431	-3.617*
	(2.014)	(2.070)	(3.247)	(6.614)	(1.853)	(2.107)
$\ln(\hat{\sigma_v}^2)$	0.597	0.683	0.587	0.576	0.599	0.776
	(0.516)	(0.542)	(0.508)	(0.553)	(0.528)	(0.527)
Observations	500	500	500	500	500	500
Number of id	125	125	125	125	125	125

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. In (1) to (3) partner gender was relative to male co-participant while partner ethnic was relative to non-Javanese.

6.5.2 Mismatched Titles and Ethnicity/Gender

The honorific titles represented ethnicity and gender, and this is common knowledge among the Indonesian population in general. However, the accuracy of these titles in predicting ethnicity and gender is subject to population composition (i.e., a large proportion of the population needs to come from either an Acehnese or Javanese background). Around 50 per cent of the participants were ethnic Javanese, but the rest of the participants were very diverse.[14] Therefore, the titles should have accurately predicted the ethnicity and gender of at least the Javanese participants.

The honorifics accurately predicted the ethnicity of all 64 Javanese participants. These (Javanese) honorifics also correctly predicted gender, except for one participant who chose *Mbak* as his or her title. However, not all non-Javanese chose *Bang* or *Kak*, and many preferred typical Javanese honorifics, for an unknown reason. In addition, six participants' gender did not match the expected preferred honorifics. This mismatch may have somehow affected their decisions in the experiment.

Excluding participants with mismatched ethnicity and gender did not change the results, particularly result 2 (no discrimination was found by ethnicity or gender), where the Wilcoxon test could not reject the null of same distribution in burning decision by ethnicity and gender. Table 6.8 indicates that, even after dropping observations with mismatched ethnicity/gender, the results remained unchanged. Those who misreport their titles were indifferent with the rest of the sample with respect to their demographic characteristics (age, gender, marital status and student status) based on the Wilcoxon test at 5 per cent significance level. Nevertheless, those misreporting ethnicity and gender tend to burn less in all dimensions (e.g., relative to those who did not misreport, they burn less of both Javanese and non-Javanese money; vice versa with regard to gender).

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[14]The second highest ethnic group is Sundanese (eight per cent), followed by Minangkabau (five per cent) and 26 other ethnic groups, such as Papuan, Chinese and Buginese.

Table 6.8: Panel regression with samples with mismatched honorific titles and actual ethnicity/gender (dependent variable: burning decision)

	(1)	(2)	(3)	(4)	(5)	(6)
Female partner	-1.237***	-1.461***	-1.265***	-0.672*	-0.890**	-0.563
	(0.288)	(0.306)	(0.300)	(0.385)	(0.396)	(0.375)
Male partner	-0.683**	-0.700**	-0.790**	*(base)*	*(base)*	*(base)*
	(0.321)	(0.275)	(0.328)			
Javanese partner	-0.0562	-0.105	-0.0599	-0.0803	-0.136	-0.0842
	(0.158)	(0.151)	(0.170)	(0.203)	(0.186)	(0.215)
Female	-4.515**	-2.511	-4.066**	-7.142***	-6.336**	-6.589**
	(1.809)	(1.772)	(1.836)	(2.733)	(2.574)	(2.803)
Anger	0.0278	0.0581	0.0370	0.000984	0.0391	0.00742
	(0.0478)	(0.0432)	(0.0473)	(0.0677)	(0.0574)	(0.0663)
Female × anger	0.212**	0.115	0.188*	0.339**	0.310**	0.311**
	(0.0996)	(0.0964)	(0.0997)	(0.150)	(0.138)	(0.152)
Negative belief	1.723***	1.720***	1.587***	2.499***	2.653***	2.281***
	(0.424)	(0.455)	(0.458)	(0.681)	(0.724)	(0.725)
Javanese	-0.290	-0.0542	-0.370	-0.781	-0.518	-0.852
	(0.405)	(0.365)	(0.395)	(0.618)	(0.563)	(0.616)
Age	-0.00761	0.00838	-0.0116	0.00936	0.0459	0.00497
	(0.0355)	(0.0323)	(0.0328)	(0.0558)	(0.0430)	(0.0509)
Muslim	-0.185	-0.283	-0.249	0.210	0.102	0.117
	(0.424)	(0.406)	(0.432)	(0.585)	(0.536)	(0.597)
Married	-0.682	-0.513	-0.516	-1.177*	-1.039	-0.987
	(0.444)	(0.438)	(0.483)	(0.681)	(0.667)	(0.754)
Income >AUD 2,000.	-0.0285	-0.0597	0.0609	0.0361	0.0111	0.145
	(0.368)	(0.339)	(0.382)	(0.565)	(0.505)	(0.592)
Student	-1.230***	-1.067***	-1.228***	-1.716***	-1.779***	-1.741**
	(0.426)	(0.402)	(0.440)	(0.656)	(0.647)	(0.704)
Constant	0.162	-1.320	0.241	-0.491	-2.616	-0.390
	(1.565)	(1.430)	(1.533)	(2.231)	(1.914)	(2.142)
$\ln(\hat{\sigma_v}^2)$	-0.0705	0.265	-0.128	0.457	0.581	0.436
	(0.460)	(0.408)	(0.501)	(0.571)	(0.529)	(0.590)
Sample	Exclude mismatch ethnic	Exclude mismatch gender	Exclude mismatch ethnic & gender	Exclude computer & mismatch ethnic	Exclude computer & mismatch gender	Exclude computer & mismatch gender & ethnic
Observations	450	595	420	360	476	336
Number of id	90	119	84	90	119	84

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. In (1) to (3), partner gender was relative to the computer co-participant, while partner ethnicity was relative to non-Javanese.

6.5.3   Other Sub-traits of Aggression and Artefact Effects

Aside from anger, the other sub-traits of aggression—hostility, physical aggression and verbal aggression—had no effect on antisocial decisions (Table A.9; to conserve space, regression tables are presented in the appendix from this point onwards). The aggression index that combined all four sub-traits also had no significant association with burning

behaviour. In all instances, the participants tended to reduce the payoffs of male more than female co-participants.

Finally, it could be that the effect of the interaction term was not limited to being between gender and anger, yet Table A.10 did not seem to suggest this. Interacting anger with other demographic characteristics (ethnicity, religion, marital status, income, age, negative beliefs and students) did not result in significant associations between the interaction term and antisocial decisions. Still, females were less likely to be a target of money burning, students were less likely to burn, and negative beliefs positively predicted antisocial behaviour.

6.6 Conclusion

This chapter has presented the findings from the Melbourne experiment, which predated the Aceh study. It is understood that Indonesian migrants have very different demographic backgrounds than those living in Aceh—particularly their lower probability of experiencing violent conflict; therefore, these migrants could not be used as a benchmark. Nonetheless, the observed behaviour reflected the decisions made by a more general population. Importantly, the experiment was valuable because it could be used to test whether the original design could generate meaningful results and identify the factors behind antisocial behaviour.

A significant proportion of the participants chose to destroy others' money, which violated the rational prediction of zero money burning, and thus answered the first research question. Payoff-destruction experiments are often used to explain money destruction as a result of inequity aversion or pure spite. Given that the participants received an equal amount of endowment in this experiment, this suggests that pure spite was the main driver of the money-burning behaviour. Another possible explanation was the vividness and salience of ethnic identity, but the use of honorifics was aimed at minimising this effect. Nevertheless, the low burn rate (relative to the prediction from the meta-analysis) reflected the relative content felt by Indonesian migrants in Australia. In fact, only six per cent of the participants behaved antisocially when decisions against the computer

were excluded—a figure that was almost half the result from an equivalent experiment (Abbink & Herrmann, 2011).

This experiment generated further interesting results, as follows. The first and second results (no differential or discrimination in antisocial behaviour by ethnicity or gender) answered the second research question. The result was as expected and, since this experiment was conducted before the Aceh study, it confirmed the unbiased (towards specific ethnicity or gender) design of the experiment. It also adds to the other-regarding preferences literature, where there was a mixed or indifferent effect of gender (Croson & Gneezy, 2009; Sent & van Staveren, 2018), and specifically to the antisocial behaviour literature that mostly ignored the role of gender. The absence of out-group discrimination signalled the positive relationship within the Indonesian migrant community and reflected the behaviour of a general Indonesian population who had never experienced conflict.

The third result (females were less likely to receive payoff reduction) was not expected, and only occurred when decisions against the computer were excluded. This result is similar to the dictator game literature, where women were given more money than men (Dufwenberg & Muren, 2006). From game design point of view, and assuming that antisocial and altruism are on the same spectrum, the dictator game is diametrical to the JoD game.

The fourth and fifth results answered the third research question on the antecedents of antisocial behaviour. The fourth result (females that chose to burn tended to have a higher score of anger than did males) implied that these females had a different perception of anger, which was reflected in their behaviour in the experiment. This finding was in line with the psychology literature, which hypothesises that women view anger as a loss of control, as opposed to men who view anger as seizing control (Astin et al., 2003; Litvak et al., 2010). In addition, an antisocial experiment in conflict region (Israel) found that anger had mixed effects on antisocial behaviour and was conditional on exposure to violence (Zeitzoff, 2014).

Meanwhile, the fifth result indicated that participants' tendency to behave antisocially was strongly predicted by their expectation regarding their co-participant's de-

cisions. This finding was also found in the antisocial behaviour literature (Abbink & Herrmann, 2011; Prediger et al., 2014). However, only half of those with negative belief that actually chose the antisocial decision (the proportion was lower than in the afore-mentioned studies that hover between 81 to 86 per cent). In addition, it also expanded the literature on intention-based reciprocity pioneered by Rabin (1993).

These results were robust to a battery of tests, such as dropping observations with mismatched honorific titles and actual gender/ethnicity, using other sub-traits of aggression to replace anger, interacting anger with other demographic variables and the inclusion of various measures of personal attitudes. However, using bootstrap standard errors weakened some of the results.

Finally, the findings from this experiment also directly informed the field study in Aceh. Gender could influence behaviour, as shown in the third and fourth results. However, this effect could be transmitted through different channels because of the different population and socioeconomic background. In addition, consistent with past findings, negative beliefs were also expected to predict antisocial behaviour, and there were no strong reasons that the participants in Aceh would behave differently. Finally, because of the unexpected result, the Aceh study did not include a computer co-participant. However, this creates opportunity for further research on human-machine interactions.

Chapter 7

The Experiment in Aceh

This chapter discusses the results from the main experiment of this thesis. The experiment in Aceh was successfully conducted during April 2018, and some of the results were published in Chuah, Feeny, Hoffmann, and Sanjaya (2019). Unlike the participants from the Melbourne experiment, a significant proportion of the Aceh participants had experienced actual conflict. The findings from the study provide support for a comprehensive reconciliation process that must address both gender and ethno-cultural issues.

7.1   Introduction

Social scientists have been searching for the long-term effect of war on economic performance (Miguel & Roland, 2011), human capital (Ichino & Winter-Ebmer, 2004), religiosity (Henrich, Bauer, Cassar, Chytilova, & Purzycki, 2019) and behaviour (Bauer et al., 2016). In particular, the economic costs of conflicts can persist for generations when destroyed social capital reduces future cooperation and trust, especially between former adversary groups (Bauer et al., 2016; Colletta & Cullen, 2000; Ghobarah, Huth, & Russett, 2003).

Following Bauer et al. (2016), there are three theoretical explanations for how war affects prosocial behaviour: changes in parochial norms and preferences, changes in economic incentives and psychological changes. In the contact literature, regular contact with out-group members could change someone's preference, as it is believed to increase empathy or reduce information asymmetry and anxiety (Pettigrew & Tropp, 2006). Changes in

parochial norms and preferences may also affect behaviour through being hostile towards the out-group for the benefit of the in-group members (parochial altruism). Inter-group differentiation, such as parochialism, does not occur naturally, as individuals must be able to internalise the group's identity and make inter-group comparisons along relevant relational attributes (Tajfel & Turner, 1979).

This chapter reports the results from a lab-in-the-field experiment on the effect of the Aceh conflict on antisocial behaviour. The experiment focuses on the elicitation of antisocial behaviour with a strategy method, which makes it possible to identify differential behaviour, if any, against ethnic in/out-group members. One controversial aspect of the Aceh conflict was the targeting of ethnic Javanese (Schulze, 2004). While the peace-building process in Aceh is considered a success story, it remains unknown to what extent the grievances among different ethnic groups—particularly between Acehnese and Javanese—are affecting their behaviour. Together with salient ethnic identities that are convenient for parochialism to exist, the experiment predicts persistent hostility between the two ethnic groups involved. Therefore, unlike the Melbourne experiment, participants in the Aceh study would have directly experienced conflict. In addition, the computer co-participant was excluded from this study because there was no indication of dissent among the Melbourne participants and because of the puzzling behaviour observed against the computer.

The Aceh study sought to answer the following research questions: (1) Do the participants differentiate in money burning based on ethnicity and gender? (2) What are the antecedents of antisocial behaviour among the participants? The answers to these questions have policy implications for national and local governments.

The remaining sections of this chapter are structured as follows. Section 7.2 examines the current situation in Aceh, which complements Chapter 2's overview of the region during the conflict. Section 7.3 explains the methodology, followed by the results in Section 7.4 and robustness checks in Section 7.5. Section 7.6 extends the analysis by comparing results with the data from Melbourne. Finally, Section 7.7 concludes the chapter.

7.2   Post-conflict Aceh

The 2005 peace agreement ended three decades of Aceh conflict. In addition to improved economic fairness (in the form of fairer natural resource revenue sharing), Aceh received political freedom and self-governance short of independence, such as through the establishment of local political parties. Today, the majority of the democratically elected local government leaders, including the current Governor of Aceh, are ex-GAM members affiliated with the local political parties. As part of the peace memorandum, Aceh is also the only Indonesian province allowed to fully implement *syariah* (Islamic law). As stipulated in Law No. 11/2006, Aceh has also enjoyed special autonomy funds from the national government from 2008. For the first 15 years, the amount of the fund will be equal to two per cent of the national General Allocation Fund (the central government's transfer to sub-national governments), which will be reduced to one per cent during the last five years of the implementation. The special autonomy fund drastically increased the region's public revenue from just IDR 1.3 trillion in 1999 to IDR 8.4 trillion in 2007. The special autonomy fund is expected to run until 2026.

Despite the achievements in economic and political aspects, both the national and local governments were slow in investigating serious human rights abuses in Aceh (Amnesty International, 2013). For example, the Aceh's Truth and Reconciliation Commission only started its formal public hearing at the end of November 2018—13 years after the conflict ended. This prolonged process has had a devastating effect on the victims of the conflict and their relatives, and has not been helpful in securing long-term peace. Moreover, women were largely ignored during the peace process, despite their active role during the insurgency. For example, no women from the Indonesian government or the Acehnese were present during the early peace process, which resulted in the exclusion of women or gender issues. The absence of such issues in the peace agreement is unfortunate, as the experiences of women in Aceh were not limited to replacing men in social roles, but also included active participation in the war. In addition, no women were included in the reintegration compensation list of 3,000 ex-combatants (Lee-Koo, 2012).

The effect of violence differs depending on gender, as revealed by a 2006 survey

of 1,792 individuals, which found that 21 per cent of the women in Aceh suffered from post-traumatic stress disorder—a proportion significantly larger than that among men (17 per cent) (Grayman, Good, & Good, 2009). Unsurprisingly, the respondents were almost unanimous in highlighting the Indonesian security forces—the military or police—as violence perpetrators. There is also evidence of women's marginalisation following the 2004 tsunami. The aftermath of the tsunami led to around USD 7 billion in aid for relief and reconstruction programs, including for the Reconstruction of Aceh Land Administration System project, which was aimed at restoring land ownership in the region (World Bank, 2006). The accompanying fieldwork established that female victims of the tsunami and conflict found themselves in a difficult position to claim land ownership because of the biased inheritance law and customs (Fitzpatrick, 2012). In some cases, these women's own relatives denied their legitimate claims, and village leaders sometimes agreed with the denial, which led to women feeling powerless.

In Aceh, ethnic violence sometimes arose after the peace agreement, including violence perpetrated by ethnic minorities, as in the 2008 killing of five KPA members (*Komite Peralihan Aceh*; a civil organisation that represents ex-GAM combatants) (World Bank, 2008). There have also been reports of non-violent but conflicting inter-ethnic relations, with people belonging to ethnic minorities feeling that the local governments were imposing Acehnese norms (Ehrentraut, 2010). One common experience of discrimination against ethnic minorities is alienation through the use of Acehnese language.

The intensity of violence in today's Aceh is relatively low compared with Indonesia as a whole (110 versus 143 violent incidents per million people in 2014). However, as depicted in Figure 7.1, the intensity of violence in Aceh in 2014 spread evenly across all districts, relative to 2005 when the peace agreement was signed. Vigilantism in the name of *syariah* has also become a problem in Aceh. *Syariah* condemns some aspects of private and civil life as criminal offences, such as extramarital affairs and alcohol consumption. It is also used by some locals to justify vigilantism; however, some scholars (e.g., Kloos, 2014) argue that the violent acts are the result of unclear moral authority at the village level (where most of the vigilantism occurs).
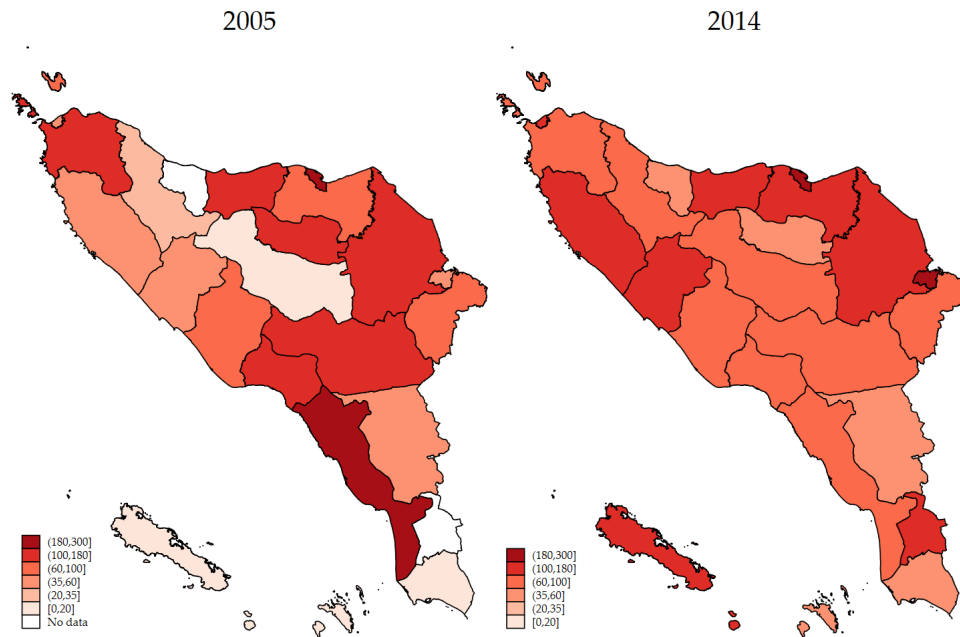
Figure 7.1: Number of non-domestic violent incidents per million people in Aceh

Source: Calculated from NVMS and population census.

These facts indicate the ongoing turmoil in the region, despite the many achievements following the peace agreement. These issues also identify some concerns—particularly the grievances of women—that could harm Aceh's reconciliation process. Together, this information provides the context for the lab-in-the-field experiment, from Aceh's turbulent past to today's fragile peace.

7.3   Methodology

7.3.1   Experimental Design

The Aceh study used the same experimental design (a variation of the JoD minigame) as in the Melbourne study (see the instructions and questionnaires in Appendix C). In this game, participants were asked if they were willing to pay to destroy a portion of their co-participant's money. Participants made decisions against four different types of co-participants, identified by their preferred honorific titles (Acehnese and Javanese males

and females are addressed as *Bang* and *Kak* and *Mas* and *Mbak*, respectively). Unlike in Melbourne, the computer co-participant was excluded in the Aceh study. Only one decision in each pair of participants was implemented, following a coin toss. Sessions were held simultaneously at two different locations to avoid any post-experiment repercussions. This was necessary given the sensitivity of the experimental design and the history of conflict between the two major ethnic groups.

After the decision task, the participants were asked to answer questionnaires regarding war victimisation, SVO and personal attitudes and beliefs (negative belief, Machiavellianism, aggression, religiosity and religious fundamentalism). In particular, questions on war victimisation were asked because of the direct experience of conflict among the Aceh participants. Negative beliefs, Machiavellianism and aggression were also asked, given their importance in predicting antisocial behaviour found in past studies (including the Melbourne experiment). Questions about SVO were asked because these could be used to elicit prosocial preferences that could be directly compared with the antisocial behaviour observed in this experiment. Finally, the two sets of questions on beliefs (religiosity and religious fundamentalism) were asked because of Aceh's special autonomy in its implementation of *syariah*.

7.3.2   Implementation

Each session had three phases. In the first phase, participants were seated alone, were asked to sign the consent form and answered the demographic characteristics questionnaire. The questionnaire was generally the same as in Melbourne, except for some irrelevant questions that were excluded in the Aceh study (e.g., on length of stay and reason for staying in Australia). In the second phase, each participant received an equal endowment of IDR 75,000 and asked whether they were willing to pay IDR 3,000 to reduce IDR 30,000 of their co-participant's money.[1] The ratio of cost to money destruction and the ratio of money reduction to endowment were 10 per cent and 40 per cent, respectively, which were the same proportions as in the Melbourne experiment. In the final (third)

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[1]The exchange rate was AUD 1 = IDR 10,700. The minimum wage in Aceh was IDR 2.7 million per month.

phase, participants were paid a flat fee of IDR 25,000 for completing the post-experimental questionnaires.

Payments for both the experimental fee and flat fee were made after the third phase was completed. Combining the flat fee and the experiment's fee, each participant could at most receive IDR 100,000, which was roughly equal to a day's work, and at worst received IDR 70,000. On average, each participant received a final payment of IDR 97,000.

Participation in the study was voluntary and posters were placed on community notice boards, in local shops and in other public areas a few days before each session. During the recruitment process, potential participants were told that they would be asked to make some choices in a decision task, in addition to answering questionnaires. They were also told that there would be questions about their conflict experience. The participants had to be at least 25 years old to ensure they could correctly recall their memory of the conflict, which was expected to increase the accuracy of answers in the self-report war victimisation questionnaire. They also needed to have lived in Aceh for at least one year during the height of the conflict (2000 to 2005).

Ten sessions were conducted in April 2018 in 10 randomly chosen villages (five in each of the two chosen districts, Aceh Timur and Aceh Utara), with around 20 people participating per session. The two districts were chosen as they share a border and have similar characteristics, with Acehnese the ethnic majority. More importantly, both districts suffered less than a two per cent decline in the 2005 GDP as a result of the 2004 tsunami (the average decline in all districts in Aceh was 19.17 per cent according to Mangkusubroto, Said, Steer, & Hellman, 2005). Two transmigration villages in each of the districts were randomly selected to ensure a proportional representation of ethnic Javanese. Transmigration is the government's policy to resettle families, mainly from the overpopulated island of Java, to the outer islands of Indonesia, including Aceh. Around 400,000 Javanese people (8.9 per cent of the Aceh population) live in the region, according to the 2010 population census. This makes this ethnic group the second largest in the region.

All instructions and forms were written in plain Indonesian language and RAs were

instructed to follow the procedures. Sessions were conducted in the village's *meunasah* (all-purpose meeting hall) and lasted for approximately two hours. See the photographs in Figures B.11, B.12 and B.13 in the appendix, which document typical experimental sessions, payment process and poster placement in Aceh, respectively.

No major political events occurred during the experiments and the most recent district head elections were held in early 2017. There were also no natural disasters or other significant events that could have affected behaviour during the study. There was no indication of resentment during the sessions and, overall, the study progressed well and finished a few days ahead of schedule.

To conclude, the implementation of the Aceh experiment was similar to the experiment in Melbourne except regarding: (i) the exclusion of the computer co-participant, (ii) the amount and currency of the fees, (iii) the exclusion of irrelevant questions from the demographics questionnaire and (iv) the participants being expected to come from the same village where the session was held.

7.4   Results

A total of 204 participants completed the whole session, with an average age of 38 years. Around three-quarters were married and they had received an average 11 years of education. Approximately 34 per cent of the participants were females. See Table 7.1 for the summary statistics.

Acehnese was the dominant ethnic group, with 170 participants (83 per cent). Therefore, despite having a higher proportion of Javanese in the sample (12.7 per cent) relative to the actual population (8.9 per cent from the 2010 census), the total number of Javanese was only 26. As a result of the small number of Javanese and other ethnic group participants in the data, most of the analyses focus only on the Acehnese. The following sub-sections examine the patterns of conflict experience, patterns of antisocial behaviour and regression results.

Table 7.1: Summary statistics, Aceh

Variable	Obs.	Mean	Std dev.	Min.	Max.
Burn money	204	0.25	0.43	0	1
Conflict experience (injured or killed)	204	0.50	0.50	0	1
Conflict experience (injured and killed)	204	0.25	0.44	0	1
Negative belief	204	0.33	0.47	0	1
Age	204	38.42	11.04	25	72
Acehnese	204	0.83	0.37	0	1
Female	204	0.34	0.47	0	1
Married	204	0.74	0.44	0	1
Years of education	204	11.01	3.73	0	16
Income >IDR 2 million/month	204	0.11	0.32	0	1

7.4.1   Patterns of Conflict Experience

The main measure of conflict experience was derived from the war victimisation survey, where the variable equalled 1 if the participants or their household members were injured or killed in 2000 to 2005 and 0 otherwise. This measure was almost absent in the Melbourne experiment, as there were only three (Acehnese) participants who could answer questions on their Aceh conflict experience.

Half of the participants had experienced war victimisation (bottom right cell in Table 7.2). Acehnese males experienced conflict more than Acehnese females in the sample (56 versus 46 per cent, respectively), but the gap was much higher in the non-Acehnese sample with (43 versus 17 per cent). In particular, no Javanese females claimed to have experienced conflict. In contrast, females experienced more conflict than males in the 'other' ethnic group (neither Acehnese nor Javanese), although this was a very small sample size.

Table 7.3 displays the results of probit regressions, based on a similar model from Cassar et al. (2013), where Model 1 indicates that conflict experience was not associated with any of the explanatory variables except income (at 10 per cent level) when all observations were used. The coefficient indicates that those with low income were somehow less prone to be war victims. This finding might lead to the issue of endogeneity if there were variables omitted from the determinants of conflict experience regression. However, as shown in the main regressions (Section 7.4.3), income did not predict money-burning

Table 7.2: Mean conflict experience by ethnicity and gender

| | Acehnese | Non-Acehnese | | | Total |
| | | All | Javanese | Other | |
	$(n = 170)$	$(n = 34)$	$(n = 26)$	$(n = 8)$	$(n = 204)$
Male $(n = 69)$	0.56	0.43	0.50	0.17	0.53
Female $(n = 135)$	0.46	0.17	0.00	0.50	0.43
Total $(n = 204)$	0.52	0.38	0.42	0.25	0.50

behaviour.

Acehnese females were not significantly associated with conflict experience (Model 2). When the sample of those older than 25 in 2000 was used (Model 3), where participants' education was already predetermined, none of the explanatory variables could explain conflict experience. The same pattern was also discovered when the data were restricted to the Acehnese sample (Models 4 to 5).

Finally, one recent study suggested an association between religiosity and war experience, where this war-sociality hypothesis expects conflict experience would increase religiosity, proxied by membership of religious group and attendance of religious events (Henrich et al., 2019). However, the Aceh data only found limited support for this. The experience of conflict was associated with higher religiosity, but only with regard to the dimension of consequential religiosity—the belief that one's behaviour is associated with religion or religious teaching—as shown in Models 1 and 2 in Table 7.4. This result did not change significantly when other measures of war experience were used as the explanatory variable (Models 3 to 5). However, other dimensions of religiosity and its composite index had no such association (results not shown).

Table 7.3: Determinants of conflict experience (dependent variable: conflict experience [injured or kileld])

	(1)	(2)	(3)	(4)	(5)
Age	0.00695	0.00719	-0.0309	0.000521	-0.0392
	(0.00956)	(0.00961)	(0.0279)	(0.0107)	(0.0298)
Years of education	-0.0269	-0.0306	-0.0785	-0.0362	-0.0587
	(0.0288)	(0.0285)	(0.0512)	(0.0304)	(0.0530)
Income >IDR 2 million/month	0.619*	0.617*	0.858	0.760**	0.615
	(0.322)	(0.322)	(0.624)	(0.356)	(0.633)
Region lived in 2003: Aceh Timur	0.279	0.223	-0.370	0.360	-0.614
	(0.622)	(0.595)	(1.120)	(0.405)	(0.736)
Region lived in 2003: Aceh Utara	-0.114	-0.139	-0.374	0.000248	-0.587
	(0.601)	(0.582)	(1.158)	(0.405)	(0.751)
Region lived in 2003: Other Aceh	0.316	0.300	0.375	*(base)*	*(base)*
	(0.629)	(0.615)	(1.192)		
Female	-0.226	-0.591	0.110	-0.213	0.236
	(0.197)	(0.635)	(0.352)	(0.206)	(0.388)
Ethnicity: Javanese	-0.359	*(base)*	-0.162		
	(0.312)		(0.535)		
Ethnicity: Other	-0.795	*(base)*	-0.454		
	(0.530)		(0.780)		
Ethnicity: Acehnese	*(base)*	0.416	*(base)*		
		(0.306)			
Acehnese × female		0.398			
		(0.668)			
Constant	0.0239	-0.334	2.748	0.280	3.212*
	(0.769)	(0.725)	(1.923)	(0.716)	(1.818)
Sample	All	All	Age >25 in 2000	Acehnese	Acehnese age >25 in 2000
Observations	204	204	67	170	53

Notes: Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Region lived was relative to those who moved outside Aceh in 2003 in (1) to (3). Probit models were used in the regressions. Data at individual level.

Table 7.4: Consequential religiosity (dependent variable) and conflict experience, Aceh

	(1)	(2)	(3)	(4)	(5)
Conflict experience (injured or killed)	0.823***	0.816***			
	(0.249)	(0.257)			
Conflict experience (injured and killed)			0.786***		
			(0.251)		
Conflict experience (injured)				0.832***	
				(0.240)	
Conflict experience (HH member killed)					0.728***
					(0.253)
Age		-0.0168	-0.0156	-0.0142	-0.0176
		(0.0154)	(0.0155)	(0.0153)	(0.0157)
Female		0.820***	0.783***	0.789***	0.775***
		(0.244)	(0.245)	(0.243)	(0.248)
Ethnicity: Javanese		0.503	0.486	0.541	0.478
		(0.470)	(0.458)	(0.467)	(0.463)
Ethnicity: Other		-0.439	-0.697	-0.472	-0.659
		(0.878)	(0.894)	(0.881)	(0.892)
Years of education		0.0532	0.0543	0.0550	0.0514
		(0.0377)	(0.0384)	(0.0386)	(0.0378)
Income >IDR 2 million/month		0.133	0.322	0.185	0.274
		(0.353)	(0.345)	(0.360)	(0.341)
Region lived in 2003: Aceh Timur		0.456	0.462	0.476	0.465
		(0.781)	(0.825)	(0.784)	(0.828)
Region lived in 2003: Aceh Utara		-0.445	-0.547	-0.371	-0.594
		(0.736)	(0.774)	(0.739)	(0.776)
Region lived in 2003: Other Aceh		-0.0789	-0.256	-0.107	-0.350
		(0.851)	(0.871)	(0.849)	(0.897)
Constant	8.458***	8.215***	8.409***	8.087***	8.524***
	(0.210)	(1.063)	(1.103)	(1.082)	(1.090)
Observations	185	185	185	184	184
R^2	0.054	0.188	0.176	0.187	0.173

Notes: Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Ethnicity was relative to Acehnese. Region lived was relative to those who moved outside Aceh in 2003. OLS were used in the regressions. Although full sample were used in the regressions, the numbers of observations were less than 204 since many of the participants did not complete the religiosity questionnaire.

7.4.2   Patterns of Antisocial Behaviour

One of four participants chose to burn at least one of their co-participant's money when all observations were included.[2] This proportion was larger than in the Melbourne experiment (16 per cent; statistically different at 10 per cent using the Chi-square test), but lower than the prediction from the meta-regression (the expected burn rate was 38 per cent $\pm$ 13 per cent confidence intervals).[3]

Result 1: The burn rate in Aceh was higher than in Melbourne.

Acehnese tended to burn less than non-Acehnese, and the difference was pronounced among males, as shown in Figure 7.2. The wide confidence intervals in the non-Acehnese sample were because of the very small number of observations (particularly among females, $n = 6$). Therefore, the following analyses used only the Acehnese sample, unless indicated otherwise.

Result 2: Acehnese were less likely to behave antisocially than were Javanese participants.

Figure 7.3 displays the incidence of money burning for (Acehnese) females and males, according to the ethnicity of their co-participants and whether the participants had experienced conflict. The figure suggests there were important out-group effects, with both females and males being more likely to have burnt money when their co-participant identified as Javanese (light versus dark teal bars). The findings from the Wilcoxon signed rank tests indicated that this out-group effect was statistically significant in the case of males (p-value = 0.0348) yet not females (p-value = 0.1573).

Result 3: Acehnese participants were more likely to behave antisocially against Javanese co-participant.

This result was also found among the Javanese participants and, in fact, the rate was higher. On average, 42 and 31 per cent of Javanese burnt Acehnese and Javanese co-participants, respectively. Nevertheless, the small number of Javanese in the sample made it difficult to generalise this finding.

The figure also displays large gendered differences in burning for participants who

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[2]The proportion was lower (21 per cent) with the Acehnese sample.
[3]The rate for Melbourne was for the burning decision of at least one human co-participant.
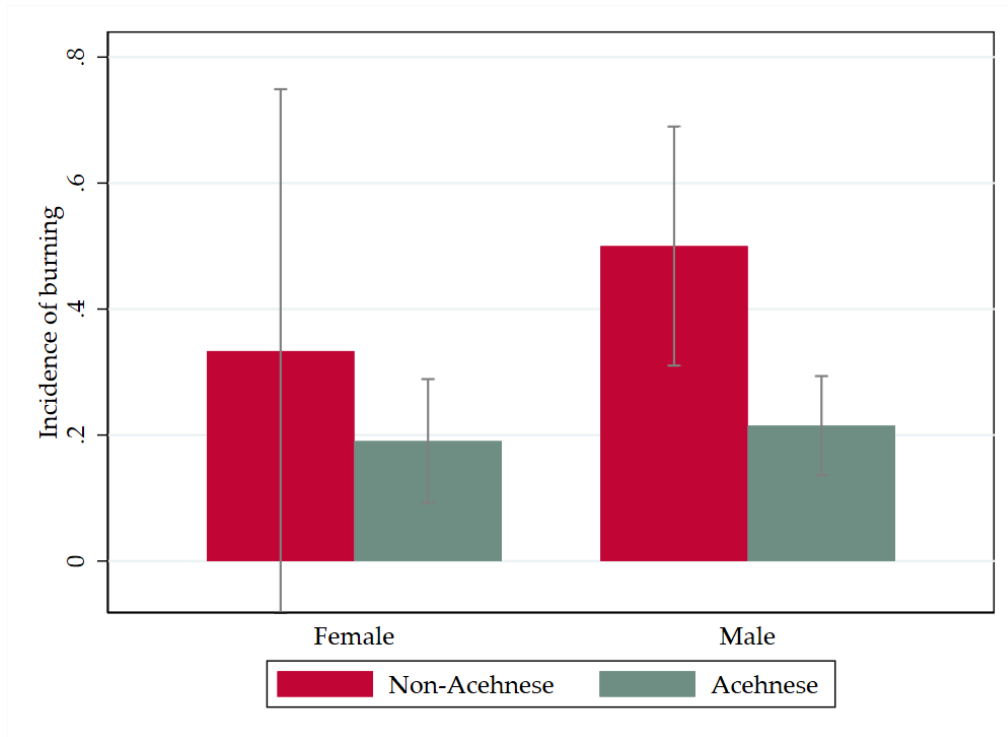
Figure 7.2: Incidence of burning by ethnicity and gender
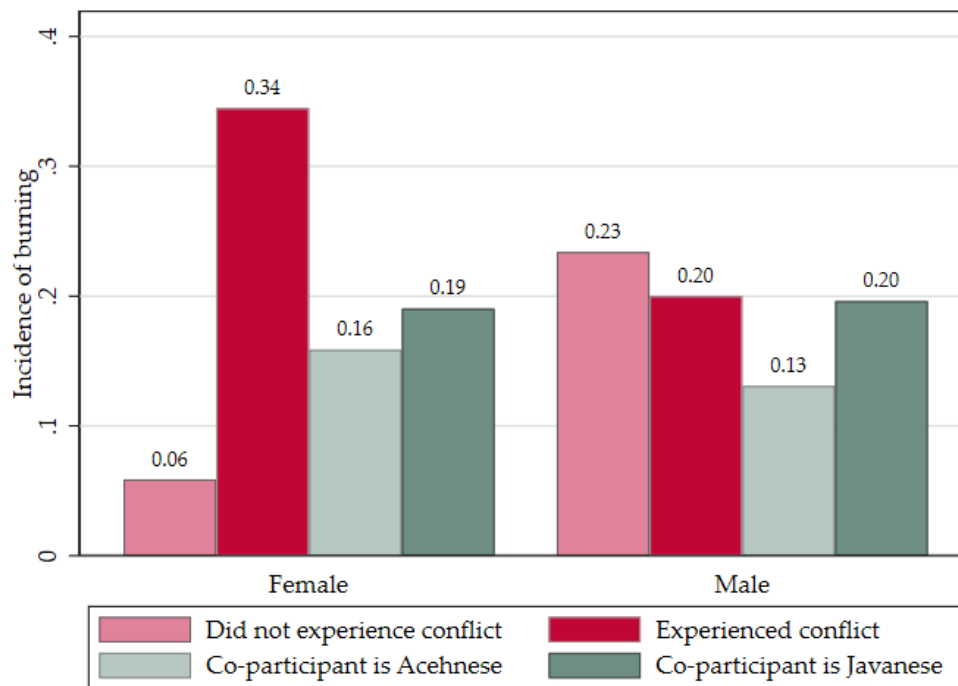
Figure 7.3: Incidence of burning by gender, conflict experience and co-participant's ethnicity

Note: Acehnese sample only.

Table 7.5: Antisocial behaviour, personal attitudes and beliefs; Aceh

	All	Male	Female
Religiosity	0.2618	0.4440	0.6778
Religiosity: ritual	0.2869	0.6674	0.0574*
Religiosity: consequential	0.1688	0.0400**	0.4492
Religiosity: ideological	0.1378	0.7214	0.0154**
Religiosity: experiential	0.7818	0.9168	0.5328
Religious fundamentalism	0.7957	0.1081	0.0362**
Mach-IV	0.1661	0.9103	0.0407**
Aggression	0.5224	0.7970	0.2718
Aggression: anger	0.7319	0.9813	0.4399
Aggression: hostility	0.6796	0.9743	0.4601
Aggression: physical	0.1097	0.4354	0.0946*
Aggression: verbal	0.2071	0.4813	0.2862

Note: The numbers are p-values from the Mann-Whitney test for unmatched data (by money burning decision). Acehnese only. $*p < 0.10, **p < 0.05, ***p < 0.01$.

had experienced conflict (light versus dark red). Among females, there was a much higher incidence of burning for those who had experienced conflict (34 per cent) relative to those who had not (six per cent) (Mann-Whitney p-value = 0.0043; Fisher's exact p-value = 0.008). For males, the incidence of burning for those who had experienced conflict was less than, although similar to, the incidence for those who had not: 20 versus 23 per cent (Mann-Whitney p-value = 0.6720; Fisher's exact p-value = 0.813).

Result 4: Acehnese females who had experienced conflict were more likely to burn money.

Finally, none of the personal attitudes and beliefs were associated with money-burning (Table 7.5), but some were different by gender, particularly regarding aspects of religiosity. However, this latter association might be confounded with findings from the previous sub-section, where consequential religiosity was correlated with conflict experience.

The following sub-sections generalise and extend these results by controlling for a number of demographics, conflict experience, personal attitudes and other control variables.

7.4.3 Regressions Results

Panel probit random-effect regressions were performed to robustly test some of the results in the previous sub-section, where the dependent variable was a binary variable taking the value of 1 if the participant decided to destroy (burn) their co-participant's stake and 0 otherwise. The use of strategy method made it possible to detect behaviour against those of different gender or ethnicity. To do this, the data needed to be reshaped into a panel of individuals and their (four) burning decisions.

Coefficient estimates of six models are presented in Table 7.6. Model 1 presents the results of a parsimonious model that included the gender and conflict experience (injured or killed) of the Acehnese participant, as well as the gender and ethnicity of their co-participant. The three subsequent regressions augmented this model with interaction terms according to the other characteristics of the participant and their co-participant. The interactions terms were included individually to avoid problems associated with collinearity. The findings across the different models confirmed a significant out-group effect. The Acehnese participants were more likely to burn when their co-participant identified as Javanese relative to Acehnese, which confirmed Result 3. This effect was not statistically significant in Models 2 and 3, since the 'Javanese partner' variable was also included in interaction terms, resulting in collinearity and large standard errors.

Table 7.6: Main regressions, Aceh

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Javanese partner	0.514**	0.498	0.210	0.494**	0.499**	0.497**	0.0119
	(0.241)	(0.322)	(0.386)	(0.231)	(0.230)	(0.236)	(0.383)
Conflict experience (injured or killed)	0.523*	0.524*	0.256	-0.499	-0.553	-0.556	-1.146
	(0.318)	(0.316)	(0.434)	(0.468)	(0.637)	(0.646)	(0.767)
Female	-0.0660	-0.0920	-0.0606	-1.793*	-1.542	-1.221	-2.387**
	(0.336)	(0.447)	(0.335)	(1.027)	(0.966)	(0.975)	(1.177)
Female partner	0.121	0.122	0.119	0.117	0.120	0.358	0.114
	(0.222)	(0.221)	(0.223)	(0.212)	(0.212)	(0.292)	(0.215)
Female × Javanese partner		0.0470					1.234
		(0.464)					(1.080)
Javanese partner × conflict experience			0.493				0.961
			(0.492)				(0.631)
Female × conflict experience				2.999***	2.991**	3.022**	4.234***
				(1.115)	(1.221)	(1.244)	(1.464)
Female × female partner						-0.668*	
						(0.404)	
Female × Javanese partner × conflict experience							-1.805
							(1.248)
Negative belief					2.153***	2.177***	2.213***
					(0.557)	(0.557)	(0.561)
Age					0.0127	0.0131	0.0125
					(0.0251)	(0.0254)	(0.0257)
Years of education					0.0666	0.0676	0.0660
					(0.0626)	(0.0634)	(0.0638)
Income >IDR 2 million/month					0.405	0.406	0.411
					(0.895)	(0.906)	(0.906)
Region lived in 2003: Aceh Timur					-2.097**	-2.122**	-2.174**
					(1.004)	(1.022)	(1.058)
Region lived in 2003: Aceh Utara					-1.462	-1.480	-1.519
					(0.996)	(1.010)	(1.046)
Constant	-4.477***	-4.470***	-4.311***	-3.202***	-3.417*	-3.588**	-3.150*
	(1.003)	(1.011)	(0.982)	(0.758)	(1.779)	(1.813)	(1.837)
$\ln(\hat{\sigma_v}^2)$	2.293***	2.295***	2.293***	1.855***	1.473***	1.502***	1.535***
	(0.585)	(0.586)	(0.574)	(0.501)	(0.354)	(0.356)	(0.369)
Observations	680	680	680	680	680	680	680
Number of id	170	170	170	170	170	170	170

Notes: Panel probit regressions with random effects. Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Region lived was relative to those who moved to other regions in Aceh in 2003.

The results from Model 4, including an interaction term, revealed that, *ceteris paribus*, female participants who had experienced conflict were more likely to burn their co-participant's money. The coefficient of this term was positive and highly statistically significant, which supported Result 4. This finding is likely to be the result of women suffering more from conflict than men, as discussed in the introduction. Among females, experience of intensive conflict generates persistent hostility. There was also weak evidence of differential money-burning behaviour by gender (Models 4 and 7), with females tending to burn less.

There is also a weak evidence of differential money-burning behaviour by gender (Models 4 and 7), where females tend to burn less.

Result 5: Controlling for the interaction between gender and conflict experience, Acehnese females were less likely to burn money.

The above results were robust to the inclusion of control variables, such as negative belief, age, income and education in Model 5. Income, in particular, was not correlated with burning behaviour. Consistent with the Melbourne data and past studies, negative belief strongly predicted antisocial behaviour.

Result 6: Negative belief positively predicted antisocial behaviour.

When an interaction term between the participant's own gender and the co-participant's gender was included in Model 6, the results remained the same.

Finally, Model 7 contained a three-way interaction between gender, conflict experience and Javanese partner, and the differential conflict experience of women was still observed. The insignificance of the estimated parameter of the three-way interaction term also implied that Acehnese women who had experienced conflict did not necessarily aim their antisocial decisions against Javanese co-participants.

Result 7: Acehnese females who had experienced conflict did not aim their money burning towards Javanese co-participants.

7.5   Robustness Checks

The previous regression results could be sensitive to several issues. This section discusses several factors that could confound the results: sample selection, alternative measures of conflict experience, artefact interaction effects and the effect of personal attitudes.

7.5.1   Sample Selection

This study included two issues regarding sample selection. First, this study excluded non-Acehnese in the previous regressions. Second, sample selections due to age, migration and mismatched honorifics-ethnicity/gender.

Table 7.7 displays the regression results with all observations, including those from the Javanese minority, and the results are largely the same, whereby females with conflict experience tended to be more antisocial. The exclusion of the Javanese sample in previous regressions was not only due to the small sample size, but also because of the selection problem, as the ethnic group was targeted during the conflict. In the simplest regression, Model 1, Acehnese tended to burn less; however, once additional controls were included, this effect disappeared (Model 2). Interestingly, in all models, but prominently in Model 1, the coefficient sign for the Acehnese dummy variable was negative, which indicated that non-Acehnese tended to be more spiteful.

Models 3 to 5 indicated that the animosity towards ethnic out-group members (as indicated by Acehnese $\times$ Javanese partner) persisted even after controlling for females with conflict experience. Meanwhile, Model 5 indicated a three-way interaction between gender, ethnicity and conflict experience, and the results were basically the same. Note that the estimated parameter for female $\times$ conflict experience was now negative, which meant that non-Acehnese females who had experienced conflict tended to be *less* antisocial. This finding contrasts with Result 4, suggesting that conflict experience affects females' behaviour differently by ethnicity. Nonetheless, this finding could be caused by the small number of non-Acehnese participants and the opposing pattern of war victimisation among non-Acehnese, as shown in Table 7.2 in Section 7.4.1 above.

Table 7.7: Regression with full sample (dependent variable: burning decision)

	(1)	(2)	(3)	(4)	(5)
Javanese partner	0.223	0.226	-0.514	-0.512	-0.525
	(0.197)	(0.194)	(0.397)	(0.395)	(0.405)
Conflict experience (injured or killed)	-0.167	-0.247	0.572	-0.256	1.325*
	(0.437)	(0.467)	(0.417)	(0.477)	(0.801)
Female	-1.720*	-1.355*	-0.0196	-1.396*	-1.080
	(0.882)	(0.780)	(0.445)	(0.797)	(1.516)
Female partner	0.110	0.112	0.112	0.114	0.113
	(0.182)	(0.179)	(0.185)	(0.186)	(0.186)
Acehnese	-1.853***	-0.436	-0.881	-0.950*	-0.0337
	(0.552)	(0.516)	(0.568)	(0.575)	(0.663)
Female × conflict experience	2.756***	2.460**		2.533**	-3.125*
	(1.012)	(0.991)		(1.008)	(1.809)
Acehnese × Javanese partner			0.992**	0.996**	1.007**
			(0.457)	(0.455)	(0.463)
Acehnese × female					-0.413
					(1.773)
Acehnese × conflict experience					-2.023*
					(1.050)
Acehnese × female × conflict experience					6.158***
					(2.183)
Negative belief		2.121***	2.208***	2.177***	2.313***
		(0.456)	(0.456)	(0.464)	(0.473)
Age		0.00355	0.00656	0.00384	0.00329
		(0.0194)	(0.0207)	(0.0198)	(0.0204)
Years of education		0.0314	0.0499	0.0324	0.0553
		(0.0542)	(0.0599)	(0.0554)	(0.0556)
Income>IDR 2 million/month		0.335	0.189	0.340	0.465
		(0.688)	(0.716)	(0.704)	(0.732)
Region lived in 2003: Aceh Timur		-1.881***	-1.897***	-1.933***	-1.735**
		(0.700)	(0.699)	(0.722)	(0.755)
Region lived in 2003: Aceh Utara		-1.582**	-1.353**	-1.630**	-1.541**
		(0.682)	(0.667)	(0.700)	(0.736)
Region lived in 2003: outside Aceh		1.076	1.600	1.101	2.553*
		(1.196)	(1.250)	(1.227)	(1.329)
Constant	-1.286**	-2.009	-2.680*	-1.694	-2.815**
	(0.652)	(1.236)	(1.378)	(1.280)	(1.303)
$\ln(\hat{\sigma}_v^2)$	1.777***	1.278***	1.410***	1.336***	1.259***
	(0.422)	(0.313)	(0.311)	(0.318)	(0.319)
Observations	816	816	816	816	816
Number of id	204	204	204	204	204

Notes: Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Region lived was relative to those who moved to other regions in Aceh in 2003.

Table 7.8 displays results regarding selection on age, migration and mismatched honorifics—ethnicity/gender. There is concern about selection when study participants are already adults during conflict, and some studies intentionally recruit younger participants to address this issue (Islam et al., 2017; Gangadharan et al., 2017). However, this practice is not universal (see e.g., Bauer et al., 2016; Cassar et al., 2013; Gilligan, Pasquale, & Samii, 2014; Voors et al., 2012). Nonetheless, when using a sample of participants aged younger than 15 in 2000, the results remained relatively unchanged (Model 1).

Next, by excluding those who left Aceh in any years between 2000 and 2005—something that could not be captured by the 'region lived in 2003' variable—the results stayed the same (Model 2). Finally, honorific titles were expected to signal ethnicity and gender, but there were two Acehnese participants who chose Javanese honorifics and another one whose preferred honorific did not match with gender. Models 3 and 4 indicated that, even after dropping the observations with mismatched honorifics, the results remained unchanged.

Table 7.8: Regression with sample selection (dependent variable: burning decision)

	(1)	(2)	(3)	(4)
Javanese partner	0.697*	0.501**	0.499**	0.498**
	(0.394)	(0.231)	(0.230)	(0.230)
Conflict experience (injured or killed)	-1.130	-0.124	-0.525	-0.524
	(1.078)	(0.582)	(0.632)	(0.631)
Female	-1.678	-1.302	-1.539	-1.524
	(1.449)	(0.930)	(0.965)	(0.967)
Female partner	0.00155	0.121	0.120	0.120
	(0.328)	(0.212)	(0.212)	(0.211)
Female × conflict experience	3.375*	2.501**	2.960**	2.942**
	(2.019)	(1.148)	(1.217)	(1.216)
Negative belief	1.591**	1.888***	2.163***	2.158***
	(0.750)	(0.526)	(0.555)	(0.554)
Age	0.204	0.0188	0.0123	0.0121
	(0.135)	(0.0261)	(0.0250)	(0.0250)
Years of education	0.114	0.0892	0.0624	0.0618
	(0.0894)	(0.0612)	(0.0627)	(0.0628)
Income >IDR 2 million/month	1.482	-0.319	0.395	0.394
	(1.335)	(0.874)	(0.888)	(0.887)
Region lived in 2003: Aceh Timur	-1.483	-2.149**	-2.051**	-2.042**
	(1.297)	(0.971)	(0.999)	(0.998)
Region lived in 2003: Aceh Utara	-1.915	-1.305	-1.440	-1.436
	(1.462)	(0.950)	(0.993)	(0.991)
Constant	-8.764*	-3.969**	-3.374*	-3.363*
	(4.644)	(1.783)	(1.771)	(1.769)
$\ln(\hat{\sigma_v}^2)$	1.166**	1.401***	1.467***	1.465***
	(0.493)	(0.358)	(0.353)	(0.353)
Sample	Age <15 in 2000	Never migrate out of Aceh	Excludes mismatched gender	Excludes mismatched ethnic & gender
Observations	304	672	676	672
Number of id	76	168	169	168

Notes: Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Region lived was relative to those who moved to other regions in Aceh in 2003. The regression that excluded mismatched ethnicity gave identical results as in Model 4 because of the overlap in individuals with mismatched honorifics-gender.

7.5.2 Alternative Measures of Conflict Experience

This sub-section presents the results when alternative measures of conflict experience were used. The first was an index based on the intensity of conflict experience. The war victimisation survey asked about the intensity of conflict experience using a five-point Likert scale, and participants could answer the survey if they ticked 'yes' in the qualifying question (i.e., the eight questions on different dimensions of war victimisation).[4] Those who had never experienced any kind of war victimisation during the Aceh conflict scored zero in intensity.[5] Factor analysis was then used to construct this index of conflict experience for the participants who claimed to have been injured or had their household members killed. In Table 7.9, Model 1, when the conflict experience index was used, the estimated parameter for the female $\times$ conflict experience index (injured or killed) was still positive and significant at the 10 per cent level.[6]

The second measure asked whether either the participants or their household members had been injured or killed and, in Model 2, females who were both injured and had household members killed were still positively associated with more burning, although the p-value was only 0.115.[7] The last two models used a measure of conflict experience intensity that accounted for all dimension of war victimisation (in Model 3, the data were included as is; in Model 4, missing values were replaced with the median value of each type of war experience). In both models, these measures had no significant association with antisocial behaviour, which indicated that only certain experiences of conflict affect antisocial decisions.

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[4]A score of 1 indicated that the experience was not affecting at all, while 5 indicated that the experience was very affecting.

[5]Some data cleaning was necessary because the surveys were conducted with pen and paper, and some participants answered the intensity questions even if they had ticked 'no' in the qualifying question, and vice versa (i.e., not everyone who ticked 'yes' answered the questions on intensity). Missing values were assigned to those who ticked 'yes' but did not answer the intensity question.

[6]The estimated parameter for this measure was now negative and significant, which indicated that an intense experience of conflict reduced antisocial behaviour. However, this finding was likely due to the loss of observations from those who did not answer questions on war victimisation intensity, despite the claim that they had experienced conflict.

[7]This measure was also used in Cassar et al. (2013).

Table 7.9: Alternative measures of conflict experience (dependent variable: burning decision)

	(1)	(2)	(3)	(4)
Javanese partner	0.518*	0.495**	0.391	0.495**
	(0.286)	(0.230)	(0.286)	(0.230)
Female	-0.835	-0.171	-0.634	0.206
	(0.704)	(0.543)	(0.724)	(0.463)
Female partner	0.207	0.119	0.168	0.119
	(0.272)	(0.211)	(0.290)	(0.211)
Conflict experience index (injured or killed)	-0.480*			
	(0.275)			
Female × conflict experience index (injured or killed)	1.055*			
	(0.592)			
Conflict experience (injured and killed)		-1.040		
		(0.708)		
Female × conflict experience (injured and killed)		1.665		
		(1.057)		
Conflict experience index (all)			-0.0449	
			(0.144)	
Female × conflict experience index (all)			0.136	
			(0.353)	
Conflict experience intensity (all; median)				0.101
				(0.148)
Female × conflict experience intensity (all; median)				0.0876
				(0.221)
Negative belief	2.410***	2.230***	2.191***	2.151***
	(0.730)	(0.540)	(0.709)	(0.526)
Age	-0.0239	0.0216	-0.0214	0.0229
	(0.0288)	(0.0266)	(0.0301)	(0.0262)
Years of education	0.0302	0.0740	0.0198	0.0947
	(0.0779)	(0.0697)	(0.0903)	(0.0701)
Income >IDR 2 million/month	1.122	0.356	0.843	0.112
	(0.950)	(0.856)	(0.914)	(0.845)
Region lived in 2003: Aceh Timur	-1.951*	-2.137**	-2.044*	-1.929**
	(1.130)	(0.989)	(1.239)	(0.969)
Region lived in 2003: Aceh Utara	-1.516	-1.238	-1.390	-1.088
	(1.128)	(0.948)	(1.216)	(0.947)
Constant	-2.290	-4.086**	-2.149	-4.725***
	(1.947)	(1.885)	(2.034)	(1.819)
$\ln(\hat{\sigma_v}^2)$	1.579***	1.555***	1.705***	1.584***
	(0.386)	(0.355)	(0.402)	(0.348)
Observations	596	680	520	680
Number of id	149	170	130	170

Notes: Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. Region lived was relative to those who moved to other regions in Aceh in 2003.

7.5.3   Artefact Effects and Personal Attitudes

It was possible that the gendered experience of conflict associated with behaviour was only an artefact. However, interacting conflict experience with other variables (co-participants' ethnicity, age, negative beliefs, education and income) did not indicate any significant correlation with antisocial decisions, as shown in Table A.11 (to conserve space, regression tables of this sub-section are placed in the appendix). Only female partner $\times$ conflict experience was somehow negatively related with burning behaviour at the 10 per cent level. This implies that females were less targeted by those who had experienced conflict.

Personal attitudes and beliefs may potentially explain antisocial behaviour. In past experiments, religiosity and Machiavellianism have been found to be positively associated with antisocial behaviour (see Chapter 5, Section 5.4). However, unlike this thesis, these studies were not designed to understand cross-cultural interactions; hence, a money-burning decision generally indicated an antisocial preference towards general members of the population. In the Melbourne experiment, females who burnt money tended to have a higher score of anger than did males. In addition, as shown in Table 7.5, Section 7.4.2, antisocial behaviour was vary by gender and some personal attitudes and beliefs.

As displayed in Table A.12, antisocial behaviour was not strongly associated with religiosity, religious fundamentalism, Machiavellianism or aggression.[8] This finding was as expected given the absence of strong correlations of these variables with money-burning decision as shown in Section 7.4.2 above, although it was different from findings in Melbourne where religiosity was positively associated with spite.[9] Only SVO that can predict spiteful behaviour where individualist and competitive participants tend to be more antisocial relative to those with prosocial orientation. Some of the attitudes were multidimensional, and Table A.13 displays the regressions that included each of the dimensions. Consequential religiosity was negatively correlated with antisocial behaviour in Aceh. From the four dimensions of aggression, physical aggression was negatively related with antisocial behaviour, yet it is unclear why the effect had an unexpected direction.

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[8]It should be noted that many participants did not complete the questionnaires, which resulted in a significantly lower number of observations, except regarding SVO.

[9]This difference might be driven by the different demographics as results from the Wilcoxon rank-sum test for religiosity was not significantly different between the two sample.

Finally, Table A.14 displays the regressions that include the interaction between gender and variables found to affect money-burning differently by gender (religious fundamentalism, Machiavellianism, anger and physical aggression).[10] Religious fundamentalism was negatively associated with money-burning, but female with high score of religious fundamentalism tended to burn more (Column 1). There were no effects of Machiavellianism and anger, both directly and indirectly (through gender), on antisocial behaviour (Columns 2 and 3); but female with high score of physical aggression tended to behave less antisocially (Column 4). Importantly, the main results (the significant coefficients of Javanese partner and female $\times$ conflict experience) remained unchanged.

7.6 Aceh and Melbourne Data Comparison

The previous two sections (Sections 7.4 and 7.5) focus on results from the Aceh experiment. This section presents a deeper comparison of data from both Melbourne and Aceh, both at the individual and session-level.

The analysis of the Melbourne and Aceh experiments was conducted separately because of the (expected) differences in the demographics of the participants as indicated in Table 7.10. In particular, Melbourne participants were expected to have higher levels of education and younger age profiles, as well as a more fractionalised ethnic groups.

This conjecture was confirmed in Table 7.11 that displays the mean comparison test between participants in Melbourne and Aceh.[11] It is apparent that demographics and some personal attitudes and beliefs were significantly different. Some of the demographics that were very different are age (7 years difference on average), share of Javanese (38 percentage points difference) and education (5 years difference). Further, the number of observations on personal attitudes and beliefs varied highly in Aceh, from 204 (prosocial orientation) to just 136 (religiosity). This contrasts the Melbourne data, where all 127 participants answered questions regarding personal attitudes and beliefs. Together, these justified the decision of not pooling data from the two experiments.

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[10]Even though significant in Table 7.5, some dimensions of religiosity were excluded because they were potentially confounded with conflict experience.

[11]The result is very similar when the Wilcoxon rank-sum test was used instead.

Table 7.10: Qualitative sample differences

Demographic characteristics	Melbourne	Aceh
Residency	Expatriate	Local
Ethnic group		
- Largest	Javanese	Acehnese
- Second largest	Sundanese	Javanese
Occupational status	(Postgraduate) student	Working

Table 7.11: Mean comparison of demographics, personal attitudes and beliefs

Variable	Obs. (Aceh)	Mean (Aceh)	Obs. (Melb.)	Mean (Melb.)	Mean Diff.
Age	204	38.42	127	31.75	6.67***
Female	204	0.34	127	0.46	-0.12**
Javanese	204	0.13	127	0.50	-0.38***
Married	204	0.74	127	0.63	0.11**
Years of education	204	11.01	126	15.97	-4.95***
Negative belief	204	0.33	127	0.20	0.13***
Prosocial	204	0.65	127	0.87	-0.23***
Religiosity	136	35.96	127	35.50	0.46
Relig. fundamentalism	137	27.82	127	19.83	7.98***
Aggression	143	71.45	127	67.53	3.92**
Mach-IV	160	47.26	127	44.43	2.82***
Aggression: anger	179	16.20	127	16.37	-0.17
Aggression: hostility	175	21.13	127	20.70	0.42
Aggression: physical	161	23.26	127	19.93	3.33***
Aggression: verbal	185	10.81	127	10.53	0.28
Religiosity: ritual	149	8.72	127	8.64	0.09
Religiosity: consequential	185	8.85	127	8.77	0.08
Religiosity: ideological	175	9.23	127	9.49	-0.25*
Religiosity: experiential	191	9.09	127	8.60	0.49***

Notes: Mean difference (Aceh − Melb.) t-test with unequal variances.
$*p < 0.10, **p < 0.05, ***p < 0.01$.

Figure 7.4 depicts the effect size to better visualise the difference in personal attitudes and beliefs. Despite the statistical difference in the mean of some of the variables (see the last column in Table 7.11), only physical aggression had a medium to large effect size. However, this relatively large difference was not strongly associated with money-burning decisions in both Melbourne and Aceh. In Aceh, those who burnt money tended to have a slightly higher score of physical aggression, but the difference was not statistically significant (p-value = 0.27). In Melbourne, the difference was even smaller (p-value = 0.81).

The previous paragraphs in this section focus on the analysis of individual-level data. Next, the analysis was broadened by aggregating data at the session level. The secondary
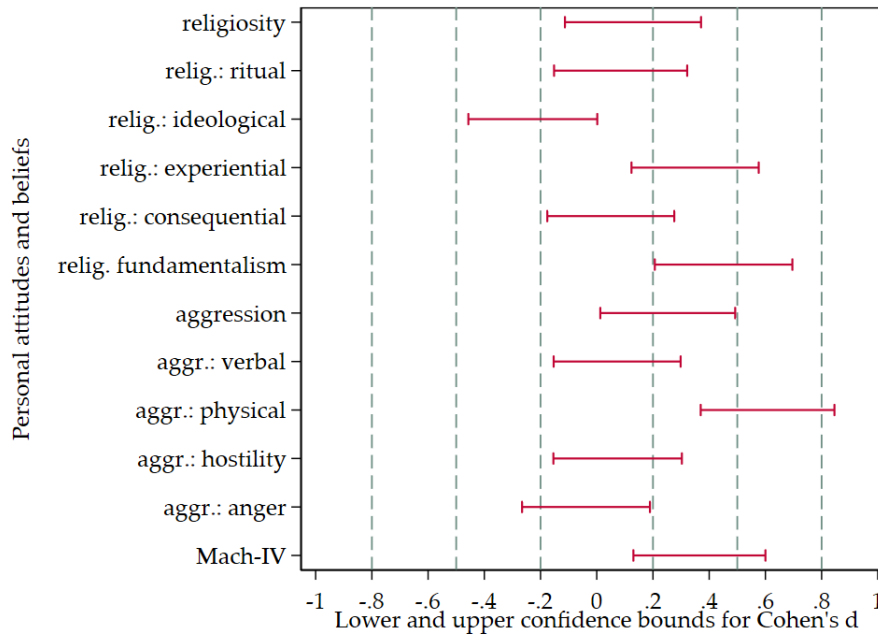
Figure 7.4: Effect size of personal attitudes and beliefs

Notes: Each horizontal red line represents the upper and lower bounds for Cohen's *d*. Absolute values around 0.2, 0.5 and 0.8 suggest small, medium and large effect sizes, respectively. Positive values indicate higher mean in Aceh relative to Melbourne.

data analysis in Chapter 4 suggested that cultural diversity has an association with the intensity of violence. This finding could be extended to determine how the variable is correlated with money-burning decisions, as the experiment captured individuals negative behaviour, which is often embedded in violent conflict. To achieve this, experimental data from both Melbourne and Aceh were merged with session-level cultural diversity. Standard measures of cultural diversity (ethnic fractionalisation and polarisation; EFI and $EPOI$) were used because the demographic questionnaire only asked about participants' ethnicity, and not their language.

At the aggregated (session) level, there was a positive correlation between cultural diversity and antisocial behaviour in Aceh, but with a wide confidence interval, as depicted in Figure 7.5. This finding implies a relatively higher incidence of money burning in villages where Acehnese was not the dominant ethnic group (as sessions with high cultural diversity had a significant number of non-Acehnese participants). The (steeper) slope from the Melbourne data could not be interpreted in a similar fashion because Aceh's
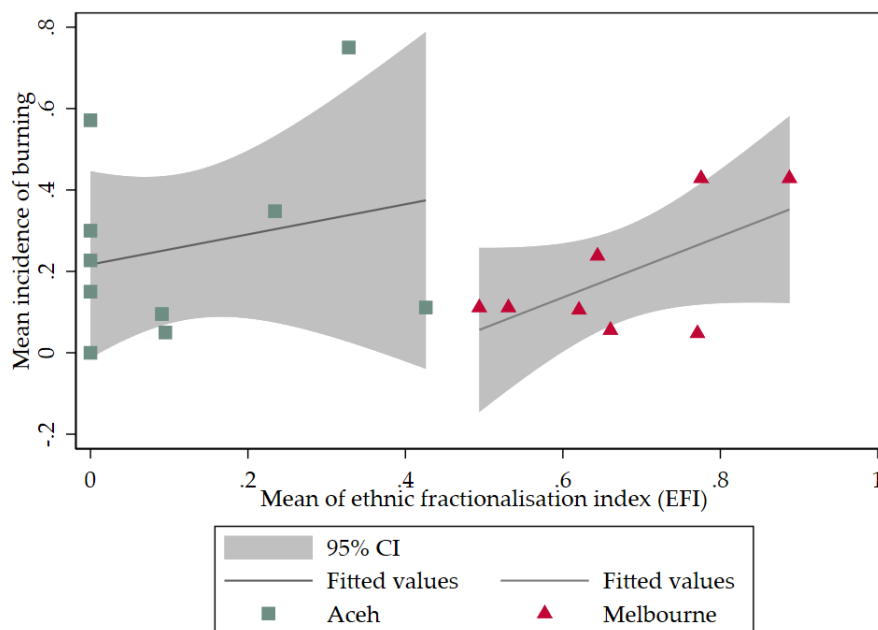
Figure 7.5: Scatter diagram of *EFI* and mean burn rate at session level

EFIs reflected the villages' cultural diversity, which was not the case for Melbourne (as participants could come from any suburb in the region). In addition, *EFIs* from Melbourne were always larger than Aceh, which indicates the culturally diverse participants attending the sessions held in Melbourne.

This observation was confirmed in the individual-level regressions using Aceh data, where, in the simplest model (Model 1, Table 7.12) *EFI* positively predicted money-burning decisions. This result held when more variables were controlled (Model 2), including the interaction between gender and conflict experience. However, the addition of negative belief and demographics altered the result and the variable became insignificant (Model 3). Using *EPOI* instead of *EFI* generated a similar result and there was no non-linear association observed from the data (results not shown).

Despite the relatively consistent finding of the negative effect of cultural diversity on antisocial behaviour, this simple exercise could not be generalised beyond the sample because of the small number of experimental sessions and the assumption that the ethnic composition in the sessions reflected the actual composition in the villages. Therefore, this finding should only be seen as indicative of the way in which cultural diversity that captures ethnic grievances is associated with individuals' antisocial behaviour.

Table 7.12: Regressions on cultural diversity and antisocial behaviour (dependent variable: burning decision)

	(1)	(2)	(3)
EFI	2.950*	3.109**	2.058
	(1.623)	(1.407)	(1.434)
Javanese partner	0.241	0.222	0.224
	(0.221)	(0.197)	(0.194)
Female partner	0.117	0.108	0.111
	(0.199)	(0.182)	(0.180)
Conflict experience (injured or killed)		-0.255	-0.289
		(0.429)	(0.458)
Female		-1.806**	-1.656*
		(0.747)	(0.860)
Female × conflict experience		2.834***	2.693***
		(0.920)	(1.015)
Negative belief			2.179***
			(0.464)
Age			0.00357
			(0.0197)
Years of education			0.0103
			(0.0567)
Income >IDR 2 million/month			-0.0488
			(0.655)
$\ln(\hat{\sigma_v}^2)$	2.616	1.840***	1.472***
	(2.245)	(0.458)	(0.330)
Constant	-4.666	-3.122***	-3.804***
	(4.216)	(0.670)	(1.201)
Observations	816	816	816
Number of id	204	204	204

Notes: Panel probit regressions with random effects. Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. All observations included. Acehnese dummy variable was excluded because it was highly correlated with *EFI*.

7.7 Conclusion

This chapter has presented the results from the Aceh experiment, where 25 per cent of the participants made the money-burning decision. This burn rate was comparatively larger than in the Melbourne study; but because of the different demographics, participants' experience of conflict may not necessarily explain this finding. Further, although most of the participants were Acehnese, they were less likely to burn money than were non-Acehnese (particularly Javanese) participants.

The main result of this study is that, while the Acehnese were less likely to behave antisocially, they tended to be more antisocial when they made decisions against non-

Acehnese, hence answering the first research question. This parochial behaviour was not particularly surprising, given the history of the conflict, but it is dismaying because the region has been experiencing relative peace for the past 14 years. Nonetheless, the strained inter-ethnic relationship is not a new issue in post-conflict Aceh, yet is poorly covered by both the media and the research community (Ansori, 2012; Miller, 2008). It is also important to note that the strained relationship is not only between Acehnese and Javanese, but also with other minority groups in Aceh.

The Aceh study elicited participants' (self-reported) conflict experience, where 50 per cent of the participants claimed to have experienced conflict. However, a regression analysis could not find variables that have consistent associations with conflict experience, except regarding income, yet only weakly. Income was positively associated with conflict experience at 10 per cent level, but the variable did not significantly predict antisocial decision. In addition, there was a positive association between consequential religiosity and conflict experience, which was similar to a recent study (Henrich et al., 2019). This result indicates the tendency of participants who experienced conflict to believe that religion plays an influential part on their lives.

This study also found that antisocial behaviour was moderated by differential gender experiences during the conflict. Acehnese women were socially active during the insurgency and took over the social roles of men. Some were even directly engaged in combat. However, they were marginalised in the aftermath of the conflict and, in a patriarchal society such as Aceh (and Indonesia in general), the return of men from war meant that the women were forced to return to their traditional roles as housewives and followers. In fact, women were more likely to suffer from post-traumatic stress disorder than men in post-conflict Aceh (Grayman et al., 2009). These factors eventually led to grievances that were likely to drive the higher number of burning decisions made by women, relative to men, who experienced conflict.

This finding also answered the second research question on the antecedents of antisocial behaviour. Personal attitudes did not seem to be an important factor that predicted spite. Only consequential religiosity and physical aggression were negatively associated

with money burning. However, this result might be biased by the strong correlation between consequential religiosity and conflict experience. In addition, there was an indication that some dimensions of personal attitudes and belief (religious fundamentalism and physical aggression) affected antisocial behaviour differently by gender.

A comparison between Melbourne and Aceh data confirms the very different demographics of the participants, particularly regarding age, education and ethnic composition, which justified the decision of analysing the two data independently. In addition, some personal attitudes and beliefs were different, although only physical aggression that had large effect size. This large difference in physical aggression manifested slightly in the Aceh participants who made the antisocial decision, but the difference in the money-burning was not statistically significant. Finally, session-level cultural diversity was also positively associated with antisocial behaviour, yet only weakly.

The policy implication of this study spans two ways. First, the slow progress in the implementation of policies that ensure long-term peace is aggravated by the finding on ethnic discrimination in this study. In light of the Law No. 11/2006 on Governance of Aceh that states that each ethnic group must be treated equally in political, economic, social and cultural matters, the governments should facilitate policies that would help restore the strained inter-ethnic relationship. Second, the different antisocial behaviour by conflict experience and gender was consistent with the history of the Aceh conflict. In addition, conflict settlement and reconciliation processes in post-conflict regions have devoted little attention to the differential experiences and needs of women, who, as a group, have not been represented (Lee-Koo, 2012). This implores the need for the empowerment of females in post-conflict process. Together, the policy implication of this study is that institutions could better ameliorate the effects of conflict by explicitly addressing gendered experiences and grievances, in addition to the inter-ethnic reconciliation policy that is usually a part of such processes.

Part IV

Discussion

Chapter 8

Discussion and Policy Recommendations

This final part summarises the thesis, elaborates the contributions and policy lessons of the research, and discusses the study limitations and directions for future research.

8.1 Introduction

This thesis is the first study on the antecedents and consequences of conflict in Indonesia. A brief account on the history of conflict was presented, as the literature has identified three main factors that contribute to violent conflict: institutional arrangements of the security force, economic motives and ethnic grievances. Regarding the latter, the Aceh insurgency was marked by controversial anti-Javanese sentiment, which led to large outmigration. In recent years, there have been indications of detrimental inter-ethnic relations in the region. In addition, the Aceh conflict was marked by the exclusion of women from the peace process—despite their role and experience during the conflict—which may have affected their behaviour.

The empirical investigations examined the antecedents of violence using secondary data analysis, and the consequences of conflict experience using lab-in-the-field experiments. A survey of cross-country and country studies was conducted to gain insights to the possible factors that contribute to violence in post-conflict Indonesia. A review of the

literature on antisocial behaviour and a meta-analysis provided the necessary theoretical and empirical guides for the experiments. An antisocial behaviour experiment was used, as the observed behaviour reflected the dark side of actual conflict.

The main experiment focused on eliciting antisocial behaviour in Aceh. The Aceh conflict was characterised by the persecution of ethnic Javanese, and the experiment was designed to capture out-group discrimination based on ethnicity and gender. Prior to the Aceh study, another experiment was conducted with Indonesian citizens in Melbourne, Australia, to observe behaviour in a community with no conflict background and to identify the antecedents of such behaviour. This experiment was also conducted to identify potential implementation problems and pitfalls that could affect the fieldwork in Aceh.

Meanwhile, the secondary data analysis was conducted using the most comprehensive data on violence in the country. The study complemented the micro experimental analysis on the effect of violence on behaviour by identifying the general, macro factors affecting violence intensity during a period in which the country enjoys relative peace.

The remainder of this chapter only consists of two sections, Sections 8.2 and 8.3, which summarise the analysis on the antecedents and consequences of violence, respectively. In each section, the main empirical findings are discussed alongside the research contributions, policy implications, limitations and suggested directions for future research.

8.2   Summary of the Antecedents of Violence

8.2.1   Main Findings

The secondary data analysis revealed an inverted-U relationship between the intensity of violence with cultural diversity during a period in which the country enjoys relative peace. This association was also observed across the different measures of cultural diversity, with and without accounting for ethnolinguistic similarities. Nonetheless, most of the districts lay in the increasing region, thereby suggesting a positive association between cultural diversity and violence. These findings were robust to different measures of violence, the inclusion of relevant explanatory variables and the use of instrumental variable method.

However, the non-linear association was sensitive to regional fixed effects, where income inequality became a significant factor that contributed to the intensity of violence. In addition, when a lagged dependent variable was included, the significance of cultural diversity disappeared. The study also found three variables that were negatively associated with the intensity of violence: the size of the economy, the number of worship places (a proxy for religious institution) and the share of Javanese (a proxy for the transmigration program). However, more work is needed to identify the mechanism that drives this association.

8.2.2 Contributions

The analysis contributes to the economics of conflict literature by providing new insights regarding the association between cultural diversity and the intensity of violence in post-conflict Indonesia, even after accounting for ethnolinguistic similarities. The curvilinear relationship aligns with the seminal work of Horowitz (1985), which suggested a non-monotonic association between ethnic groups and conflict, and was the first to be observed at country level (for a cross-country study, see Mason et al., 2011). The finding that cultural diversity matters is consistent with previous studies that found a positive relationship between violence and fractionalisation (Pierskalla & Sacks, 2017; Tajima, 2013). It also provides an identification strategy by using the out-of-Taiwan and out-of-Africa hypotheses to explain the variations in cultural diversity.

The study indicated that the Esteban and Ray (2011) model of conflict cannot fully explain the intensity of violence. The model was used with cross-country data, where the coefficients for both F and P were positive and significant (Esteban et al., 2012), yet only the latter was confirmed with the Indonesian data. The study also highlighted the potentially damaging effect of income inequality, which is similar to the finding in a previous study (Indra et al., 2019). However, the current study findings suggested that the association between the intensity of violence and income inequality was subject to regional variations.

8.2.3   Policy Implications

The findings of this research have the following policy implications. The finding regarding the role of cultural diversity is linked with Indonesian policies, such as Law No. 5/2017 on Cultural Advancement, which, while considering cultural diversity as the nations wealth and identity, must also adhere to the principle of tolerance. Specifically, some aspects of cultural diversity are prioritised in the 2019 Government Work Plan through social conflict management activities, which include conflict prevention, conflict termination and post-conflict rehabilitation. The programs include the establishment of national and sub-national action plans, inter-religious dialogues, community empowerment in 250 vulnerable locations and land-related conflict resolution. However, the implementation of social conflict management action plans varies by location. For example, in Aceh, Jakarta and the Special Region of Yogyakarta, the only relevant planned actions are socialisation events and dialogues on religious tolerance. Meanwhile, in East Java and Lampung, the protection of women and children from social conflicts has become the focus. Additionally, there are formal institutions, such as the regional leader coordination forums, that cooperate in addressing conflict and violence at local levels.

Given that existing laws and formal institutions are already in place, new policies should be aimed at incorporating cultural diversity into relevant programs, while encouraging intercultural dialogues. For example, in the context of religious education, an innovative proposal for teaching a multiculturalist theology has been envisaged to promote the positive value of diversity (Baidhawy, 2007). Considering such innovations within the context of this research highlights the need for governments (both central and sub-national) and communities to carefully account for the issue of cultural diversity in their decision-making processes. This has occurred via the regional leader coordination forums—consisting of local executive, legislative, police, judiciary and military leaders— which actively engaged in pre-emptive measures prior to the recent local and national elections. Nonetheless, challenges remain in promoting the issue nationally, as Law No. 23/2014 on Regional Governance mandates cultural affairs to be managed by sub-national governments, while retaining security affairs as the responsibility of the central govern-

ment.

Finally, the rising inequality should not be considered lightly, as evidenced by the secondary data analysis. The existing fiscal policy is argued to be neutral in its effect on income inequality, and spending should be aimed at programs with strong effects such as conditional cash transfer for the poor(World Bank, 2016). More importantly, basic provision of services should be improved in the education and health sectors, as they are argued to have high economic returns for the poor.

8.2.4 Limitations

This analysis included some limitations, as follows. First, the empirical model was not explicitly derived from a mathematical model of conflict. This approach was selected for two reasons. First, existing studies could readily provide the theoretical basis. Thus, rather than building a formal theoretical model from the ground up, this thesis focused on using relevant research—both qualitative and quantitative—to guide the empirical model. Second, most economics of conflict theories are based on rational agents maximising payoff, and the empirical models use large datasets of cross-country observations. Such rational economics models may not be relevant if the outcome of interest is small-scale violence, as the cost of mobilising people would be too high given the (small) prize. In addition, in post-conflict Indonesia, models with representative agents may not be relevant, as the eruptions of small-scale violence do not rely on elites or state actors (Barron, 2019). Therefore, although model building is a very important research agenda in the field, it was not the objective of this thesis.

Second, there was a time gap in the data analysis between the main explanatory variable (cultural diversity), taken from the 2010 population census, and the violence data (2014). This was unavoidable because the census is decennial, while the violence data covered all provinces only in 2014. Although the curvilinear relationship was still observed when using 2010 data, the number of observations was severely reduced to only around 154 districts (31 per cent of the 2014 data). The panel data analysis also assumed a relatively unchanged population distribution. Therefore, the findings should

be interpreted with caution. In addition, the NVMS is no longer collecting data, which made it impossible to extend the analysis to any year beyond 2014.

8.2.5   Suggested Directions for Future Research

Developments in the literature influenced this research as it progressed. This sub-section reflects on the research process, which, in conjunction with the research limitations, opens the opportunity for future research.

A number of qualitative studies suggest that one of the main sources of violence is related to an institutional factor regarding the military. However, this issue was not directly considered in the thesis, since the last major military reforms happened more than a decade ago, in 2004, whereas this thesis was concerned with small-scale violence, which has been argued elsewhere to be unrelated to support from local or central elites. There is also already a study tackling this issue in the context of communal violence during the transition era (Tajima, 2013). Nonetheless, whether institutional arrangements of the military are associated with conflict remains a valid and interesting question that merits future research.

The secondary data analysis used data from the NVMS, which is no longer updated, since 2015 onwards. In the future, the findings from this study can be compared when violence data are extracted from other sources, such as the village census. Other data (e.g., GDELT, 2018; ICEWS, 2018) can also be used for cross-country comparisons.

All the literature reviewed in this thesis focused on finding conflict determinants, yet one promising future research area is the use of machine learning techniques to predict conflict. To date, there has been one study on conflict prediction in Indonesia (and Colombia as a comparison) using sub-national level data from the NVMS and Podes (Bazzi, Blair, et al., 2019). In the future, big-data, such as from GDELT (2018), would provide richer data at even more disaggregated levels that could be used to predict conflict.

The effect of cultural diversity could also be investigated at the individual level using experimental method. For example, cultural diversity has been found to affect public goods contributions, conditional on the levels of group conflict (Espinosa, Fatás,

& Ubeda, 2019). Such study would improve understandings of the cultural drivers of conflict, which would not be attainable using observational data.

8.3   Summary of the Behavioural Consequences of Violence

8.3.1   Main Findings

The macro analysis (antecedents of violence) using secondary data was complemented with the micro analysis using a novel lab-in-the-field antisocial experimental game. Two experiments were conducted in Melbourne and Aceh using a modified version of the JoD minigame (Abbink & Herrmann, 2011).

Data from the Melbourne experiment indicated that, overall, one in four participants were willing to behave antisocially. However, the inclusion of the computer co-participant made the observed antisocial behaviour against the human co-participant small in comparison. The burn rate against the former (20 per cent) was more than three times that against the latter (six per cent). As a result of this unexpected finding, as well as the absence of upset participants, the computer was removed in the Aceh experiment.

Nonetheless, the study supported past findings on the predictive power of negative beliefs on antisocial behaviour and the tendency of students to behave more rationally than non-students (i.e., less likely to burn money). There were also gender effects, with females burning less than males (when decisions against the computer were excluded), and with female participants with a high score of anger tending to behave more antisocially. Finally, the Melbourne data did not indicate discrimination against those of different ethnicity or gender and, together with the low burn rate, suggested a relatively harmonious relationship among Indonesian migrants in Australia.

The lab-in-the-field experiment in Aceh indicated a similar burn rate as in Melbourne, with one in four participants choosing money burning. However, this rate was actually higher, given that there was no computer co-participant in Aceh. The data indi-

cated discrimination against ethnic out-group members, yet the more important finding was the higher antisocial behaviour of females who had experienced conflict. This last finding was robust to different measures of conflict experience and potential selection problems. Negative beliefs also predicted antisocial behaviour, which was consistent with past studies and the Melbourne experiment.

8.3.2   Contributions

These experiments contribute to the antisocial behaviour literature on several grounds. The higher payoff-destruction against the computer co-participant in the Melbourne experiment signalled individuals differential behaviour when facing a machine. Although the inclusion of computers as random decision makers in antisocial behaviour experiments is not new (see e.g., Abbink & Sadrieh, 2009; Almås et al., 2019), most studies did not allow participants to make decisions against them. While this finding is not conclusive, it opens a new area for further research.

The experiments ability to discriminate by ethnicity and gender adds to the antisocial behaviour literature, which often ignores these roles. There was robust evidence of antisocial behaviour aimed at ethnic out-group members in the Aceh experiment. This was unsurprising given the history of conflict. However, the fact that parochialism remains after more than 10 years of peace suggests that existing policy interventions, if any, are not so effective in bringing together the different ethnic groups. This finding adds to the economics of conflict literature, with a previous study finding that the participants exhibited lower prosociality when their co-participants cultural identity was revealed and when memories of the 1999 to 2000 conflict in Ambon, Indonesia, were activated (Werner & Lambsdorff, 2019). It also presents a similar story to another study that observed worsened trust in polarised societies (Waldmann, 2003).

Meanwhile, the finding that women who experienced the Aceh conflict behaved more antisocially than men implies that conflict experience is perceived differently by gender. This finding is supported by the 2006 survey, which indicated that 21 and 17 per cent of the women and men in Aceh suffered from post-traumatic stress disorder, respectively

(Grayman et al., 2009). It also aligns with studies in other post-conflict regions that found that women suffer greater physical (Ghobarah et al., 2003; Plümper & Neumayer, 2006) and mental (Kimhi, Eshel, Zysberg, & Hantman, 2010; Kimhi & Shamai, 2006) health harm, including post-traumatic stress disorder. This differential traumatic experience might be driven by the gender-based violence used as a war tactic (Strachan & Haider, 2015). Moreover, no women were included in the reintegration compensation list of 3,000 ex-combatants. Together, these issues seem to have influenced the antisocial behaviour among the Aceh participants.

The fact that, in the Melbourne experiment, females that chose to burn money tended to have higher score of anger than did males implies the different perception of anger by gender. This might be explained by the psychology literature, which hypothesises that, while men view anger as seizing control, women view anger as a loss of control (Astin et al., 2003; Litvak et al., 2010). Anger was also central to the analysis of Zeitzoff (2014) who found a combined effect of violence exposure and anger on antisocial behaviour, although the author did not specifically discuss gender difference.

Finally, some findings confirmed the general results from other relevant studies. For example, negative belief as a strong predictor of spiteful behaviour was also found in past studies (Abbink & Herrmann, 2011; Prediger et al., 2014). In addition, the tendency of students to behave more rationally and selfishly than non-students (Belot, Duch, & Miller, 2015) was confirmed in the Melbourne data, where students were less likely to burn money.

8.3.3 Policy Implications

The Melbourne experiment indicated the relative harmony among Indonesian migrants, which supports the National Agenda for a Multicultural Australia. In addition, the positive association between student status and lower antisocial behaviour provides support for the promotion of higher education, especially for overseas students.

The results from the Aceh experiment will assist the local government in understanding the current dynamics of the intercommunity relationship in at least two ways.

First, the study suggests that the long-term effect of past inter-ethnic tension on current behaviour has not yet become the focus of current administrations. The finding on ethnic discrimination agrees with qualitative studies that indicated strained inter-ethnic relationships in Aceh. Together, these findings are of policy relevance, since Article 211 of Law No. 11/2006 on the Governance of Aceh stipulates the governments (national and sub-national) should not only recognising the various ethnic groups, but also protecting and respecting ethnic diversity in Aceh. The law also states each ethnic group must be treated equally in political, economic, social and cultural matters. Therefore, the governments should devote more attention to policies that would help restore the strained relationship. This could be achieved, for example, by facilitating intercultural dialogues and programs that would bring people from all ethnic groups together.

Second, the different conflict experiences of females, which was reflected in their behaviour, were consistent with Acehs experience, in which women were side-lined during the peace process despite their involvement during the conflict. This signifies the need to push for the increased involvement of females in post-conflict resolution and the peace process, given that they, as a group, have suffered as much as, if not more than, their male counterparts. This finding also offers lessons for other post-conflict regions, where gender issues can be better addressed during the resolution and reconciliation process.

8.3.4   Limitations

The number of antisocial behaviour experiments was very low at the beginning of this research in 2016. Consequently, there was limited information that could be used to predict behaviour, apart from the meta-analysis (which was relatively simple because of the small number of observations and lack of data on standard deviations). This effectively reduced the meta-analysis to using only simple OLS regressions to find the correlations between the burn rate and a few experimental characteristics. Together with the small sample size, the meta-analysis could only be used as a rough guide in identifying the factors that may explain variations in the burn rate.

The data from the Melbourne experiment could not be compared directly with the

Aceh data, given the very different population and the computerised co-participant in the former experiment. In addition, with only 127 observations, the sample size was fairly small, which rendered it difficult to conduct a reliable analysis by ethnicity (except by simply comparing Javanese with non-Javanese) or of those who only burnt their human co-participants money.

Given the limited resources, the Aceh experiment was conducted only in two districts (out of 23 districts/municipalities in Aceh), which limits the generalisation of the results to the whole region. The size of the non-Acehnese sample (particularly Javanese) was also relatively small, which rendered the side-by-side comparison with the Acehnese sample less reliable. Nevertheless, the proportion of Javanese in the sample was larger than that in the population (12.7 versus 8.9 per cent, respectively).

Finally, the design of the experiment was country-specific which could not be reliably implemented with non-Indonesian participants. The results, therefore, only reflected the dynamics of inter-ethnic relationships within Indonesian communities.

8.3.5   Suggested Directions for Future Research

The Melbourne experiment observed interactions among Indonesians, which was useful to understand within-community cohesion. An experiment that enabled interactions between migrants and the host communities would have direct policy relevance that would complement this study.

The unexpected findings regarding decisions against the computer in the Melbourne experiment create the opportunity for further research to identify the driving factors. For example, participants may act impulsively, dislike computers or be curious about computers making human decisions. This research would also fall within the general experimental study on humanmachine interactions (M. T. P. Adam, Teubner, & Gimpel, 2018; Gogoll & Uhl, 2018).

The use of the aggression questionnaire to reveal anger limited the interpretation of the finding that angers interaction with gender drives antisocial behaviour. Therefore, this study could be advanced, for example, by using priming method to evoke anger (or

other emotions) (Zeitzoff, 2014).

The Aceh study was a cross-cultural, antisocial experiment designed to capture out-group biases stemming from specific historical instances. It was not meant to test the accuracy of the Abbink and Sadrieh (2009) JoD utility function. In addition, an antisocial experiment that captured inter-group conflict (e.g., Abbink & Doğan, 2018) would provide further evidence on antisocial behaviour at the group level.

Bibliography

Bibliography

Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. *American Economic Review*, *93*(1), 113-132. doi: 10.1257/000282803321455188

Abbink, K. (2012). Laboratory experiments on conflict. In *Oxford handbook of the economics of peace and conflict.* New York: Oxford University Press.

Abbink, K., Brandts, J., Herrmann, B., & Orzen, H. (2010). Intergroup conflict and intra-group punishment in an experimental contest game. *American Economic Review*, *100*(1), 420-447. doi: 10.1257/aer.100.1.420

Abbink, K., & de Haan, T. (2014). Trust on the brink of armageddon: The first-strike game. *European Economic Review*, *67*, 190-196. doi: 10.1016/j.euroecorev.2014.01.009

Abbink, K., & Doğan, G. (2018). How to choose your victim. *Games and Economic Behavior*, *113*, 482-496. doi: 10.1016/j.geb.2018.10.006

Abbink, K., & Herrmann, B. (2010). Pointless vendettas. *CBESS Discussion Paper 09-10*.

Abbink, K., & Herrmann, B. (2011). The moral costs of nastiness. *Economic Inquiry*, *49*(2), 631-633. doi: 10.1111/j.1465-7295.2010.00309.x

Abbink, K., Masclet, D., & Mirza, D. (2011). Inequality and riots - experimental evidence. *CIRANO Scientific Series, Montréal 2011s-10*.

Abbink, K., Masclet, D., & Veelen, V. (2011). Reference point effects in antisocial preferences. *CIRANO-Scientific Publications 2011s-11*.

Abbink, K., & Sadrieh, A. (2009). The pleasure of being nasty. *Economics Letters*, *105*(3), 306-308. doi: 10.1016/j.econlet.2009.08.024

Adam, A. W. (2008). The history of violence and the state in Indonesia. *CRISE Working Paper No. 54*. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.871.3964&rep=rep1&type=pdf

Adam, M. T. P., Teubner, T., & Gimpel, H. (2018). No rage against the machine: How computer agents mitigate human emotional processes in electronic negotiations. *Group Decision and Negotiation*, *27*(4), 543-571. doi: 10.1007/s10726-018-9579-5

Alesina, A., & La Ferrara, E. (2002). Who trusts others? *Journal of Public Economics*, *85*(2), 207-234. doi: 10.1016/s0047-2727(01)00084-6

Allansson, M., & Croicu, M. (2018). UCDP battle-related deaths dataset codebook version 18.1. *Uppsala Conflict Data Program (UCDP), Department of Peace and Conflict Research, Uppsala University*.

Allport, G. W., Clark, K., & Pettigrew, T. (1954). *The nature of prejudice.* Cambridge, MA: Perseus Books.

Almås, I., Auffhammer, M., Bold, T., Bolliger, I., Dembo, A., Hsiang, S. M., . . . Pickmans, R. (2019). Destructive behavior, judgment, and economic decision-making under thermal stress. *NBER Working Paper No. 25785*. doi: 10.3386/w25785

Altemeyer, B., & Hunsberger, B. (2004). Research: A revised religious fundamentalism scale: The short and sweet of it. *International Journal for the Psychology of Religion*, *14*(1), 47-54. doi: 10.1207/s15327582ijpr1401_4

Altonji, J. G., & Pierret, C. R. (2001). Employer learning and statistical discrimination. *The Quarterly Journal of Economics*, *116*(1), 313-350. doi: 10.1162/003355301556329

Amnesty International. (2004). *New military operations, old patterns of human rights abuses in Aceh (NAD)*. Amnesty International. Retrieved from https://www.amnesty.org/en/documents/asa21/033/2004/en/

Amnesty International. (2013). *Time to face the past*. Amnesty International. Retrieved from https://www.amnesty.org/en/documents/asa21/001/2013/en/

Andreoni, J. (1989). Giving with impure altruism: Applications to charity and Ricardian equivalence. *Journal of Political Economy*, *97*(6), 1447-1458. doi: 10.1086/261662

Andreoni, J., & Miller, J. H. (2008). Analyzing choice with revealed preference: Is altruism rational? In C. R. Plott & V. Smith (Eds.), *Handbook of experimental economics results* (Vol. 1, p. 481-487). doi: 10.1016/s1574-0722(07)00054-6

Ansori, M. (2012). From insurgency to bureaucracy: Free Aceh movement, Aceh party and the new face of conflict. *Stability: International Journal of Security and Development*, *1*(1), 31-44. doi: 10.5334/sta.ah

Aspinall, E. (2007). The construction of grievance. *Journal of Conflict Resolution*, *51*(6), 950-972. doi: 10.1177/0022002707307120

Aspinall, E. (2009). *Islam and nation: Separatist rebellion in Aceh, Indonesia*. Stanford, California: Stanford University Press.

Aspinall, E. (2016). Democratization and ethnic politics in Indonesia: Nine theses. *Journal of East Asian Studies*, *11*(02), 289-319. doi: 10.1017/s1598240800007190

Astin, S., Redston, P., & Campbell, A. (2003). Sex differences in social representations of aggression: Men justify, women excuse? *Aggressive Behavior*, *29*(2), 128-133. doi: 10.1002/ab.10044

Baidhawy, Z. (2007). Building harmony and peace through multiculturalist theology-based religious education: An alternative for contemporary Indonesia. *British Journal of Religious Education*, *29*(1), 15-30. doi: 10.1080/01416200601037478

Baillon, A., Selim, A., & van Dolder, D. (2013). On the social nature of eyes: The effect of social cues in interaction and individual choice tasks. *Evolution and Human Behavior*, *34*(2), 146-154. doi: 10.1016/j.evolhumbehav.2012.12.001

Barron, P. (2019). *When violence works: Postconflict violence and peace in Indonesia*. Cornell University Press.

Barron, P., Jaffrey, S., & Varshney, A. (2016). When large conflicts subside: The ebbs and flows of violence in post-Suharto Indonesia. *Journal of East Asian Studies*, *16*, 191-217. doi: 10.1017/jea.2016.6

Barron, P., Kaiser, K., & Pradhan, M. (2009). Understanding variations in local conflict: Evidence and implications from Indonesia. *World Development*, *37*(3), 698-713. doi: 10.1016/j.worlddev.2008.08.007

Barter, S. J. (2015). Between a rock and a hard place: Second-order minorities in the Aceh conflict. *Asian Ethnicity*, *16*(2), 152-165. doi: 10.1080/14631369.2015.1003689

Barter, S. J., & Côté, I. (2015). Strife of the soil? Unsettling transmigrant conflicts in Indonesia. *Journal of Southeast Asian Studies*, *46*(1), 60-85. doi: 10.1017/s0022463414000617

Basuchoudhary, A., & Shughart, W. F. (2010). On ethnic conflict and the origins of

transnational terrorism. *Defence and Peace Economics*, *21*(1), 65-87. doi: 10.1080/ 10242690902868343

Basurto, X., Blanco, E., Nenadovic, M., & Vollan, B. (2016). Integrating simultaneous prosocial and antisocial behavior into theories of collective action. *Science Advances*, *2*(3), e1501220. doi: 10.1126/sciadv.1501220

Bauer, M., Blattman, C., Chytilová, J., Henrich, J., Miguel, E., & Mitts, T. (2016). Can war foster cooperation? *Journal of Economic Perspectives*, *30*(3), 249-274. doi: 10.1257/jep.30.3.249

Bauer, M., Cahlíková, J., Celik Katreniak, D., Chytilová, J., Cingl, L., & Zelinsky, T. (2018). Anti-social behavior in groups. *CERGE-EI Working Paper Series*(632). Retrieved from https://papers.ssrn.com/sol3/papers.cfm ?abstract_id=3292162

Bauer, M., Cahlíková, J., Chytilová, J., & Zelinsky, T. (2018). Social contagion of ethnic hostility. *Proceedings of the National Academy of Sciences of the USA*, *115*(19), 4881-4886. doi: 10.1073/pnas.1720317115

Bauer, M., Cassar, A., Chytilová, J., & Henrich, J. (2014). War's enduring effects on the development of egalitarian motivations and in-group biases. *Psychological Science*, *25*(1), 47-57. doi: 10.1177/0956797613493444

Baum, C. F., Schaffer, M. E., & Stillman, S. (2003). Instrumental variables and GMM: Estimation and testing. *Stata Journal*, *3*(1), 1-31. doi: 10.1177/1536867x0300300101

Bazzi, S., Blair, R., Blattman, C., Dube, O., Gudgeon, M., & Peck, R. M. (2019). The promise and pitfalls of conflict prediction: Evidence from Colombia and Indonesia. *NBER Working Paper No. 25980*. Retrieved from http://www.nber.org/papers/ w25980

Bazzi, S., Gaduh, A., Rothenberg, A. D., & Wong, M. (2019). Unity in diversity? how intergroup contact can foster nation building. *American Economic Review*, *109*(11), 3978-4025. doi: 10.1257/aer.20180174

Bazzi, S., & Gudgeon, M. (2018). The political boundaries of ethnic divisions. *NBER Working Paper No. 24625*. doi: 10.3386/w24625

BBC. (2019, 7 October 2019). *West Papua: Day of violence sees at least 27 dead.* Retrieved from https://www.bbc.com/news/world-asia-49806182

Bellwood, P., Chambers, G., Ross, M., & Hung, H.-c. (2011). Are 'cultures' inherited? Multidisciplinary perspectives on the origins and migrations of Austronesian-speaking peoples prior to 1000 BC. In *Investigating archaeological cultures* (p. 321-354). doi: 10.1007/978-1-4419-6970-5_16

Bellwood, P., & Dizon, E. (2008). Austronesian cultural origins: out of Taiwan, via the Batanes Islands, and onwards to western Polynesia. In A. Sanchez-Mazas, R. Blench, M. D. Ross, I. Peiros, & M. Lin (Eds.), *Past human migrations in East Asia* (p. 55-71). Routledge.

Bellwood, P., Fox, J. J., & Tryon, D. (1995). *Austronesian prehistory in Southeast Asia: Homeland, expansion and transformation.* Canberra: ANU E Press.

Belot, M., Duch, R., & Miller, L. (2015). A comprehensive comparison of students and non-students in classic experimental games. *Journal of Economic Behavior & Organization*, *113*, 26-33. doi: 10.1016/j.jebo.2015.02.007

Berry, C. M., Ones, D. S., & Sackett, P. R. (2007). Interpersonal deviance, organizational deviance, and their common correlates: A review and meta-analysis. *Journal of Applied Psychology*, *92*(2), 410-24. doi: 10.1037/0021-9010.92.2.410

Bertrand, J. (2003). *Nationalism and ethnic conflict in Indonesia.* Cambridge: Cambridge

University Press. doi: 10.1017/CBO9780511559341

Blair, R. A., Blattman, C., & Hartman, A. (2017). Predicting local violence: Evidence from a panel survey in Liberia. *Journal of Peace Research*, *54*(2), 298-312. doi: 10.1177/0022343316684009

Blalock, H. M. (1967). *Toward a theory of minority-group relations* (Vol. 325). New York: Wiley.

Blanco, M., Engelmann, D., & Normann, H. T. (2011). A within-subject analysis of other-regarding preferences. *Games and Economic Behavior*, *72*(2), 321-338. doi: 10.1016/j.geb.2010.09.008

Blattman, C., & Miguel, E. (2010). Civil war. *Journal of Economic Literature*, *48*(1), 3-57. doi: 10.1257/jel.48.1.3

Blust, R. (1993). Central and Central-Eastern Malayo-Polynesian. *Oceanic Linguistics*, *32*(2), 241-293. doi: 10.2307/3623195

Boesen, N. (2007). Governance and accountability: How do the formal and informal interplay and change? In J. Jütting, D. Drechsler, S. Bartsch, & I. d. Soysa (Eds.), *Informal institutions: How social norms help or hinder development* (chap. 4). Paris: OECD Development Centre Studies.

Bolton, G. E., & Ockenfels, A. (2000). ERC: A theory of equity, reciprocity, and competition. *American Economic Review*, *90*(1), 166-193. doi: 10.1257/aer.90.1.166

Bonein, A., & Serra, D. (2009). Gender pairing bias in trustworthiness. *The Journal of Socio-Economics*, *38*(5), 779-789. doi: 10.1016/j.socec.2009.03.003

Boone, C., Declerck, C., & Kiyonari, T. (2010). Inducing cooperative behavior among proselfs versus prosocials: The moderating role of incentives and trust. *Journal of Conflict Resolution*, *54*(5), 799-824. doi: 10.1177/0022002710372329

Boschini, A., Dreber, A., von Essen, E., Muren, A., & Ranehill, E. (2018). Gender and altruism in a random sample. *Journal of Behavioral and Experimental Economics*, *77*, 72-77. doi: 10.1016/j.socec.2018.09.005

Bourchier, D. (1990). Crime, law, and state authority in Indonesia. In A. Budiman (Ed.), *State and civil society in Indonesia* (p. 177-212). Clayton, Victoria: Centre of Southeast Asian Studies, Monash University.

Bowles, S., & Gintis, H. (2011). *A cooperative species - human reciprocity and its evolution*. Princeton University Press.

BPS. (2014). *Survei sosial ekonomi nasional 2014 triwulan 3, modul ketahanan sosial*. National Statistics.

BPS. (2019). *Labour statistics, 2008-2018*. National Statistics. Retrieved from https://www.bps.go.id/statictable/2016/04/05/1909/penduduk-berumur -15-tahun-ke-atas-menurut-pendidikan-tertinggi-yang-ditamatkan-dan -jenis-kegiatan-selama-seminggu-yang-lalu-2008-2018.html

Bracht, J., & Zylbersztejn, A. (2018). Moral judgments, gender, and antisocial preferences: An experimental study. *Theory and Decision*, *85*(3-4), 389-406. doi: 10.1007/s11238-018-9668-6

Brandts, J., & Charness, G. (2011). The strategy versus the direct-response method: A first survey of experimental comparisons. *Experimental Economics*, *14*(3), 375-398. doi: 10.1007/s10683-011-9272-x

Bruk, S. I., & Apenchenko, V. S. (1964). *Atlas narodov mira [atlas of the peoples of the world]*. Moscow: Glavnoe Upravlenie Geodezii i Kartografi. Retrieved from https://worldmap.harvard.edu/data/geonode:Naradov_Mira_GREG

Buchan, N. R., Croson, R. T. A., & Solnick, S. (2008). Trust and gender: An examination

of behavior and beliefs in the investment game. *Journal of Economic Behavior & Organization*, *68*(3-4), 466-476. doi: 10.1016/j.jebo.2007.10.006

Buhaug, H., Cederman, L.-E., & Rød, J. K. (2008). Disaggregating ethno-nationalist civil wars: A dyadic test of exclusion theory. *International Organization*, *62*(03), 531-551. doi: 10.1017/s0020818308080181

Buhaug, H., & Rød, J. K. (2006). Local determinants of African civil wars, 19702001. *Political Geography*, *25*(3), 315-335. doi: 10.1016/j.polgeo.2006.02.005

Burr, T. R., & Pitsch, A. (2003). Ethnopolitical conflict and separatist violence. In W. Heitmeyer & J. Hagan (Eds.), *International handbook of violence research* (p. 227-245). Springer Science+Business Media, B.V. doi: 10.1007/978-0-306-48039 -3_12

Buss, A. H., & Perry, M. (1992). The aggression questionnaire. *Journal of Personality and Social Psychology*, *63*(3), 452-459. doi: 10.1037/0022-3514.63.3.452

Cadsby, C. B., Tapon, F., & Song, F. (2010). Are you paying your employees to cheat? An experimental investigation. *The B.E. Journal of Economic Analysis & Policy*, *10*(1). doi: 10.2202/1935-1682.2481

Calhoun, L. G., & Tedeschi, R. G. (2014). The foundations of posttraumatic growth: An expanded framework. In *Handbook of posttraumatic growth* (p. 17-37). Routledge.

Carpenter, J., Matthews, P. H., & Schirm, J. (2010). Tournaments and office politics: Evidence from a real effort experiment. *American Economic Review*, *100*(1), 504-517. doi: 10.1257/aer.100.1.504

Caruso, R., Petrarca, I., & Ricciuti, R. (2016). Climate change, rice crops, and violence. *Journal of Peace Research*, *53*(1), 66-83. doi: 10.1177/0022343315616061

Carver, M. (1986). Conventional warfare in the nuclear age. In P. Paret (Ed.), *The makers of modern strategy: From Machiavelli to the nuclear age.* Princeton: Princeton University Press.

Caselli, F., & Coleman, W. J. (2013). On the theory of ethnic conflict. *Journal of the European Economic Association*, *11*, 161-192. doi: 10.1111/j.1542-4774.2012.01103 .x

Cason, T. N., Saijo, T., Yamato, T., & Yokotani, K. (2004). Non-excludable public good experiments. *Games and Economic Behavior*, *49*(1), 81-102. doi: 10.1016/ j.geb.2003.11.002

Cassar, A., Grosjean, P., & Whitt, S. (2013). Legacies of violence: Trust and market development. *Journal of Economic Growth*, *18*(3), 285-318. doi: 10.1007/s10887 -013-9091-3

Cederman, L.-E., & Girardin, L. U. C. (2007). Beyond fractionalization: Mapping ethnicity onto nationalist insurgencies. *American Political Science Review*, *101*(01), 173-185. doi: 10.1017/s0003055407070086

Chambers, G. K. (2013). Genetics and the origins of the Polynesians. In *eLS*. Chichester: John Wiley & Sons, Ltd. doi: 10.1002/9780470015902.a0020808.pub2

Charness, G., Gneezy, U., & Kuhn, M. A. (2013). Experimental methods: Extra-laboratory experiments-extending the reach of experimental economics. *Journal of Economic Behavior & Organization*, *91*, 93-100. doi: 10.1016/j.jebo.2013.04.002

Charness, G., & Rabin, M. (2002). Understanding social preferences with simple tests. *The Quarterly Journal of Economics*, *117*(3), 817-869. doi: 10.1162/ 003355302760193904

Chassang, S., & Miquel, G. P. I. (2010). Conflict and deterrence under strategic risk. *The Quarterly Journal of Economics*, *125*(4), 1821-1858. doi: 10.1162/qjec.2010.125.4

.1821

Chen, D. L. (2007). Islamic resurgence and social violence during the Indonesian financial crisis. In M. Gradstein & K. A. Konrad (Eds.), *Institutions and Norms in Economic Development* (p. 179-199). Cambridge, MA: MIT Press.

Chen, D. L., & Schonger, M. (2017). A theory of experiments: Invariance of equilibrium to the strategy method and implications for social preferences. *TSE Working Paper No. 16-724*. Retrieved from https://ideas.repec.org/p/tse/wpaper/31131.html

Christie, R., Geis, F., Festinger, L., & Schachter, S. (1970). *Studies in Machiavellianism.* Elsevier Science.

Chuah, S.-H., Fahoum, R., & Hoffmann, R. (2013). Fractionalization and trust in India: A field-experiment. *Economics Letters*, *119*(2), 191-194. doi: 10.1016/j.econlet.2013.02.029

Chuah, S. H., Feeny, S., Hoffmann, R., & Sanjaya, M. R. (2019). Conflict, ethnicity and gender: A money-burning field experiment in Indonesia. *Economics Letters*, *177*, 14-17. doi: 10.1016/j.econlet.2019.01.010

Chuah, S. H., Gächter, S., Hoffmann, R., & Tan, J. H. W. (2016). Religion, discrimination and trust across three cultures. *European Economic Review*, *90*, 280-301. doi: 10.1016/j.euroecorev.2016.03.008

Chuah, S. H., Hoffmann, R., Ramasamy, B., & Tan, J. H. W. (2014). Religion, ethnicity and cooperation: An experimental study. *Journal of Economic Psychology*, *45*, 33-43. doi: 10.1016/j.joep.2014.07.002

Coleman, J. S. (1990). *Foundations of social theory.* Cambridge, MA: Belknap Press of Harvard University Press.

Colletta, N. J., & Cullen, M. L. (2000). The nexus between violent conflict, social capital and social cohesion: case studies from Cambodia and Rwanda. *Social Capital Initiative Working Paper No. 23*. Retrieved from http://documents.worldbank.org/curated/en/318921468743671186/The-nexus-between-violent-conflict-social-capital-and-social-cohesion-case-studies-from-Cambodia-and-Rwanda

Collier, P., & Hoeffler, A. (1998). On economic causes of civil war. *Oxford Economic Papers*, *50*(4), 563-573. doi: 10.1093/oep/50.4.563

Collier, P., & Hoeffler, A. (2004). Greed and grievance in civil war. *Oxford Economic Papers*, *56*(4), 563-595. doi: 10.1093/oep/gpf064

Collins, E. F. (2002). Indonesia: A violent culture? *Asian Survey*, *42*(4), 582-604. doi: 10.1525/as.2002.42.4.582

Colombijn, F. (2002). Explaining the violent solution in Indonesia. *The Brown Journal of World Affairs*, *9*(1), 49-56. Retrieved from https://www.jstor.org/stable/24590271

Cribb, R. (2001). How many deaths? Problems in the statistics of massacre in Indonesia (1965-1966) and East Timor (1975-1980). In I. Wessel & G. Wimhofer (Eds.), *Violence in Indonesia.* Hamburg: Abera-Verl.

Cribb, R. (2002). Unresolved problems in the Indonesian killings of 1965-1966. *Asian Survey*, *42*(4), 550-563. doi: 10.1525/as.2002.42.4.550

Cribb, R., & Coppel, C. A. (2009). A genocide that never was: explaining the myth of anti-Chinese massacres in Indonesia, 196566. *Journal of Genocide Research*, *11*(4), 447-465. doi: 10.1080/14623520903309503

Croson, R., & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, *47*(2), 448-474. doi: 10.1257/jel.47.2.448

Cuesta, J., & Bohórquez, C. (2012). Soccer and national culture: Estimating the impact of violence on 22 lads after a ball. *Applied Economics*, *44*(2), 147-161. doi: 10.1080/00036846.2010.500275

Czaika, M., & Kis-Katos, K. (2009). Civil conflict and displacement: Village-level determinants of forced migration in Aceh. *Journal of Peace Research*, *46*(3), 399-418. doi: 10.1177/0022343309102659

Dahlby, B. G. (1983). Adverse selection and statistical discrimination. *Journal of Public Economics*, *20*(1), 121-130. doi: 10.1016/0047-2727(83)90025-7

Daxecker, U. E., & Prins, B. C. (2016). The politicization of crime: Electoral competition and the supply of maritime piracy in Indonesia. *Public Choice*, *169*(3-4), 375-393. doi: 10.1007/s11127-016-0374-z

De Juan, A., Pierskalla, J. H., & Vüllers, J. (2015). The pacifying effects of local religious institutions: An analysis of communal violence in Indonesia. *Political Research Quarterly*, *68*(2), 211-224. doi: 10.1177/1065912915578460

Desmet, K., Ortuño-Ortín, I., & Wacziarg, R. (2012). The political economy of linguistic cleavages. *Journal of Development Economics*, *97*(2), 322-338. doi: 10.1016/j.jdeveco.2011.02.003

Desmet, K., Ortuño-Ortín, I., & Weber, S. (2009). Linguistic diversity and redistribution. *Journal of the European Economic Association*, *7*(6), 1291-1318. doi: 10.1162/jeea.2009.7.6.1291

Detik. (2019, 25 October 2019). *Korban tewas rusuh Wamena jadi 23 orang, luka-luka 63*. Retrieved from https://news.detik.com/berita/d-4718976/korban-tewas-rusuh-wamena-jadi-23-orang-luka-luka-63

Diamond, Z., & Blackwell, C. (2017). Combating the joy of destruction with pro-social behavior. *Review of Behavioral Economics*, *4*(3), 275-293. doi: 10.1561/105.00000067

Dickinson, D. L., & Masclet, D. (2019). Using ethical dilemmas to predict antisocial choices with real payoff consequences: An experimental study. *Journal of Economic Behavior & Organization*, *166*, 195-215. doi: 10.1016/j.jebo.2019.08.023

Dickinson, D. L., Masclet, D., & Peterle, E. (2018). Discrimination as favoritism: The private benefits and social costs of in-group favoritism in an experimental labor market. *European Economic Review*, *104*, 220-236. doi: 10.1016/j.euroecorev.2018.03.004

Diprose, R. (2009). Decentralization, horizontal inequalities and conflict management in Indonesia. *Ethnopolitics*, *8*(1), 107-134. doi: 10.1080/17449050902738804

Do, Q.-T., & Iyer, L. (2007). Poverty, social divisions, and conflict in Nepal. *World Bank, Development Research Group, Poverty Team Working Paper No. 07-02*. Retrieved from https://hbswk.hbs.edu/item/poverty-social-divisions-and-conflict-in-nepal

Dufwenberg, M., & Muren, A. (2006). Generosity, anonymity, gender. *Journal of Economic Behavior & Organization*, *61*(1), 42-49. doi: 10.1016/j.jebo.2004.11.007

Durham, Y., Hirshleifer, J., & Smith, V. L. (1998). Do the rich get richer and the poor poorer? Experimental tests of a model of power. *American Economic Review*, *88*(4), 970-983. Retrieved from http://www.jstor.org/stable/117014

Eagly, A. H. (2009). The his and hers of prosocial behavior: an examination of the social psychology of gender. *American Psychologist*, *64*(8), 644-58. doi: 10.1037/0003-066X.64.8.644

Easterly, W. (2001). Can institutions resolve ethnic conflict? *Economic Development and Cultural Change*, *49*(4), 687-706. doi: 10.1086/452521

Easterly, W., & Levine, R. (1997). Africa's growth tragedy: Policies and ethnic divisions. *The Quarterly Journal of Economics*, *112*(4), 1203-1250. doi: 10.1162/003355300555466

Ehrentraut, S. (2010). Dividing Aceh? Minorities, partition movements and state-reform in Aceh province. *National University of Singapore Asia Research Institute Working Paper Series No. 137*. Retrieved from http://www.ari.nus.edu.sg/wps/wps10_137.pdf

Elbadawi, I., & Sambanis, N. (2002). How much war will we see? Explaining the prevalence of civil war. *Journal of Conflict Resolution*, *46*(3), 307-334. doi: 10.1177/0022002702046003001

Emonds, G., Declerck, C. H., Boone, C., Vandervliet, E. J. M., & Parizel, P. M. (2011). Comparing the neural basis of decision making in social dilemmas of people with different social value orientations, a fMRI study. *Journal of Neuroscience, Psychology, and Economics*, *4*(1), 11-24. doi: 10.1037/a0020151

Espinosa, M. P., Fatás, E., & Ubeda, P. (2019). Linguistic diversity and out-group discrimination in bilingual societies. *Journal of Behavioral and Experimental Economics*, *81*, 102-127. doi: 10.1016/j.socec.2019.06.002

Esteban, J., Mayoral, L., & Ray, D. (2012). Ethnicity and conflict: An empirical study. *American Economic Review*, *102*(4), 1310-1342. doi: 10.1257/aer.102.4.1310

Esteban, J., & Ray, D. (1999). Conflict and distribution. *Journal of Economic Theory*, *87*(2), 379-415. doi: 10.1006/jeth.1999.2549

Esteban, J., & Ray, D. (2011). Linking conflict to inequality and polarization. *American Economic Review*, *101*(4), 1345-1374. doi: 10.1257/aer.101.4.1345

Falk, A., & Fischbacher, U. (2006). A theory of reciprocity. *Games and economic behavior*, *54*(2), 293-315. doi: 10.1016/j.geb.2005.03.001

Farid, H. (2005). Indonesia's original sin: Mass killings and capitalist expansion, 1965-66. *Inter-Asia Cultural Studies*, *6*(1), 3-16. doi: 10.1080/1462394042000326879

Fearnside, P. M. (1997). Transmigration in Indonesia: Lessons from its environmental and social impacts. *Environmental Management*, *21*(4), 553-570. doi: 10.1007/s002679900049

Fearon, J. D. (1995). Rationalist explanations for war. *International Organization*, *49*(03), 379-414. doi: 10.1017/s0020818300033324

Fearon, J. D. (2003). Ethnic and cultural diversity by country. *Journal of Economic Growth*, *8*(2), 195-222. Retrieved from https://www.jstor.org/stable/40215943

Fearon, J. D. (2004). Why do some civil wars last so much longer than others? *Journal of Peace Research*, *41*(3), 275-301. doi: 10.1177/0022343304043770

Fearon, J. D., Kasara, K., & Laitin, D. D. (2007). Ethnic minority rule and civil war onset. *American Political Science Review*, *101*(01), 187-193. doi: 10.1017/s0003055407070219

Fearon, J. D., & Laitin, D. D. (1996). Explaining interethnic cooperation. *American Political Science Review*, *90*(4), 715-733. doi: 10.2307/2945838

Fearon, J. D., & Laitin, D. D. (2003). Ethnicity, insurgency, and civil war. *American Political Science Review*, *97*(01), 75-90. doi: 10.1017/s0003055403000534

Fehr, D. (2018). Is increasing inequality harmful? Experimental evidence. *Games and Economic Behavior*, *107*, 123-134. doi: 10.1016/j.geb.2017.11.001

Fehr, E., Glätzle-Rützler, D., & Sutter, M. (2013). The development of egalitarianism, altruism, spite and parochialism in childhood and adolescence. *European Economic*

Review, *64*, 369-383. doi: 10.1016/j.euroecorev.2013.09.006

Fehr, E., Hoff, K., & Kshetramade, M. (2008). Spite and development. *American Economic Review*, *98*(2), 494-499. doi: 10.1257/aer.98.2.494

Fehr, E., & Schmidt, K. M. (1999). A theory of fairness, competition, and cooperation. *The Quarterly Journal of Economics*, *114*(3), 817-868. doi: 10.1162/003355399556151

Fehr, E., & Schmidt, K. M. (2000). Theories of fairness and reciprocity - evidence and economic applications. *CESifo Working Paper, No. 403*. Retrieved from http://web.mit.edu/14.193/www/WorldCongress-IEW-Version6Oct03.pdf

Fershtman, C., & Gneezy, U. (2001). Discrimination in a segmented society: An experimental approach. *The Quarterly Journal of Economics*, *116*(1), 351-377. doi: 10.1162/003355301556338

Fischbacher, U., & Follmi-Heusi, F. (2013). Lies in disguise - an experimental study on cheating. *Journal of the European Economic Association*, *11*(3), 525-547. doi: 10.1111/jeea.12014

Fischbacher, U., Gächter, S., & Quercia, S. (2012). The behavioral validity of the strategy method in public good experiments. *Journal of Economic Psychology*, *33*(4), 897-913. doi: 10.1016/j.joep.2012.04.002

Fitzpatrick, D. (2012). Women's rights to land and housing in tsunami-affected Aceh, Indonesia. *Asia Research Institute Aceh Working Paper No. 3*. Retrieved from http://www.wluml.org/bibliography/wrrc/content/%E2%80%9Cwomen%E2%80%99s-right-land-and-housing-tsunami-affected-aceh-indonesia%E2%80%9D

Flory, J. A., Leibbrandt, A., & List, J. A. (2014). Do competitive workplaces deter female workers? A large-scale natural field experiment on job entry decisions. *The Review of Economic Studies*, *82*(1), 122-155. doi: 10.1093/restud/rdu030

Freytag, A., Krüger, J. J., Meierrieks, D., & Schneider, F. (2011). The origins of terrorism: Cross-country estimates of socio-economic determinants of terrorism. *European Journal of Political Economy*, *27*, S5-S16. doi: 10.1016/j.ejpoleco.2011.06.009

Gächter, S., & Renner, E. (2010). The effects of (incentivized) belief elicitation in public goods experiments. *Experimental Economics*, *13*(3), 364-377. doi: 10.1007/s10683-010-9246-4

GADM. (2018). *GADM maps and data*. Retrieved from https://gadm.org

Gangadharan, L., Grossman, P. J., Molle, M. K., & Vecci, J. (2019). Impact of social identity and inequality on antisocial behaviour. *European Economic Review*, *119*, 199-215. doi: 10.1016/j.euroecorev.2019.07.004

Gangadharan, L., Grossman, P. J., & Vecci, J. (2018). Moving on up: The impact of income mobility on antisocial behaviour. *Monash Economics Working Papers 13/18, Monash University, Department of Economics*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3248540

Gangadharan, L., Islam, A., Ouch, C., & Wang, L. C. (2017). The long-term effects of genocide on social preferences and risk. *Monash Economics Working Papers, Monash University, Department of Economics*. Retrieved from http://users.monash.edu/~asaduli/pub/Conflict_March2017.pdf

Garbarino, E., & Slonim, R. (2009). The robustness of trust and reciprocity across a heterogeneous U.S. population. *Journal of Economic Behavior & Organization*, *69*(3), 226-240. doi: 10.1016/j.jebo.2007.06.010

García-Gallego, A., Georgantzis, N., & Ruiz-Martos, M. J. (2019). The heaven dictator game: Costless taking or giving. *Journal of Behavioral and Experimental*

Economics, *82*. doi: 10.1016/j.socec.2019.101449

Garfinkel, M. R., & Skaperdas, S. (2007). Chapter 22 economics of conflict: An overview. In T. Sandler & K. Hartley (Eds.), *Handbook of defense economics* (Vol. 2, p. 649-709). New York: Elsevier. doi: 10.1016/s1574-0013(06)02022-9

GDELT. (2018). *GDELT dataset.* Retrieved from https://www.gdeltproject.org/

Gershman, B., & Rivera, D. (2018). Subnational diversity in Sub-Saharan Africa: Insights from a new dataset. *Journal of Development Economics*, *133*, 231-263. doi: 10.1016/j.jdeveco.2018.01.003

Ghobarah, H. A., Huth, P., & Russett, B. (2003). Civil wars kill and maim people - long after the shooting stops. *American Political Science Review*, *97*(02), 189-202. doi: 10.1017/s0003055403000613

Gilligan, M. J., Pasquale, B. J., & Samii, C. (2014). Civil war and social cohesion: Lab-in-the-field evidence from Nepal. *American Journal of Political Science*, *58*(3), 604-619. doi: 10.1111/ajps.12067

Gius, M. (2009). The effect of gun ownership rates on homicide rates: A state-level analysis. *Applied Economics Letters*, *16*(17), 1687-1690. doi: 10.1080/13504850701675508

Gleditsch, N. P., Wallensteen, P., Eriksson, M., Sollenberg, M., & Strand, H. (2002). Armed conflict 1946-2001: A new dataset. *Journal of Peace Research*, *39*(5), 615-637. doi: 10.1177/0022343302039005007

Gneezy, U., & Imas, A. (2017). Lab in the field: Measuring preferences in the wild. *Handbook of Economic Field Experiments*, *1*, 439-464.

Gneezy, U., Niederle, M., & Rustichini, A. (2003). Performance in competitive environments: Gender differences. *The Quarterly Journal of Economics*, *118*(3), 1049-1074. doi: 10.1162/00335530360698496

Gogoll, J., & Uhl, M. (2018). Rage against the machine: Automation in the moral domain. *Journal of Behavioral and Experimental Economics*, *74*, 97-103. doi: 10.1016/j.socec.2018.04.003

Granovetter, M. (1976). Network sampling: Some first steps. *American Journal of Sociology*, *81*(6), 1287-1303. doi: 10.1086/226224

Gravert, C. (2013). How luck and performance affect stealing. *Journal of Economic Behavior & Organization*, *93*, 301-304. doi: 10.1016/j.jebo.2013.03.026

Grayman, J. H., Good, M. J., & Good, B. J. (2009). Conflict nightmares and trauma in Aceh. *Culture, Medicine and Psychiatry*, *33*(2), 290-312. doi: 10.1007/s11013-009-9132-8

Grossman, P. J., & Komai, M. (2013). Within and across class envy: Anti-social behavior in hierarchical groups. *Monash Economics Working Papers 02-13*. Retrieved from https://ideas.repec.org/p/mos/moswps/2013-02.html

Gubler, J. R., Selway, J. S., & Varshney, A. (2016). Crosscutting cleavages and ethno-communal violence: Evidence from Indonesia in the post-Suharto era. *WIDER Working Paper, No. 2016/129*. Retrieved from https://www.wider.unu.edu/publication/crosscutting-cleavages-and-ethno-communal-violence

Gunnthorsdottir, A., McCabe, K., & Smith, V. (2002). Using the Machiavellianism instrument to predict trustworthiness in a bargaining game. *Journal of Economic Psychology*, *23*(1), 49-66. doi: 10.1016/s0167-4870(01)00067-8

Habring, C., & Irlenbusch, B. (2011). Sabotage in tournaments: Evidence from a laboratory experiment. *Management Science*, *57*(4), 611-627. doi: 10.1287/mnsc.1100.1296

Hadiz, V. R. (2018). Imagine all the people? Mobilising Islamic populism for right-wing politics in Indonesia. *Journal of Contemporary Asia*, *48*(4), 566-583. doi: 10.1080/00472336.2018.1433225

Hadiz, V. R., & Robison, R. (2013). The political economy of oligarchy and the reorganization of power in Indonesia. *Indonesia*(96), 35-57. doi: 10.5728/indonesia.96.0033

Hall, P. A., & Taylor, R. C. R. (1996). Political science and the three new institutionalisms. *Political Studies*, *44*(5), 936-957. doi: 10.1111/j.1467-9248.1996.tb00343.x

Hamburger, H. (1979). Spite and hero. In *Games as Models of Social Phenomena* (chap. 4.2.4). W. H. Freeman.

Hamilton, W. D. (1964a). The genetical evolution of social behaviour. i. *Journal of Theoretical Biology*, *7*(1), 1-16. doi: 10.1016/0022-5193(64)90038-4

Hamilton, W. D. (1964b). The genetical evolution of social behaviour. ii. *Journal of Theoretical Biology*, *7*(1), 17-52. doi: 10.1016/0022-5193(64)90039-6

Hammarström, H. (2015). Ethnologue 16/17/18th editions: A comprehensive review. *Language*, *91*(3), 723-737. doi: 10.1353/lan.2015.0038

Harris, A. (2010). Separatist insurgency, objective referents and autonomy. *Cooperation and Conflict*, *45*(4), 387-405. doi: 10.1177/0010836710387023

Harrison, G. W., & List, J. A. (2004). Field experiments. *Journal of Economic Literature*, *42*(4), 1009-1055. doi: 10.1257/0022051043004577

Hedges, L. V., & Olkin, I. (2014). *Statistical methods for meta-analysis.* Academic press.

Henrich, J., Bauer, M., Cassar, A., Chytilova, J., & Purzycki, B. G. (2019). War increases religiosity. *Nature Human Behavior*, *3*(2), 129-135. doi: 10.1038/s41562-018-0512-3

Herrmann, B., Thoni, C., & Gächter, S. (2008). Antisocial punishment across societies. *Science*, *319*(5868), 1362-7. doi: 10.1126/science.1153808

Heryanto, A. (2006). *State terrorism and political identity in Indonesia: Fatally belonging.* Routledge.

Hill, P. C., & Hood, R. W. (1999). *Measures of religiosity.* Birmingham, Ala.: Religious Education Press.

Hirshleifer, J. (1989). Conflict and settlement. In J. Eatwell, M. Milgate, & P. Newman (Eds.), *Game theory* (p. 86-94). London: Palgrave Macmillan UK. doi: 10.1007/978-1-349-20181-5_6

Hirshleifer, J. (1991). The paradox of power. *Economics and Politics*, *3*(3), 177-200. doi: 10.1111/j.1468-0343.1991.tb00046.x

Hirshleifer, J. (1995). Theorizing about conflict. *Handbook of defense economics*, *1*, 165-189. doi: 10.1016/s1574-0013(05)80009-2

Hirshleifer, J. (2001). *The dark side of the force: Economic foundations of conflict theory.* Cambridge, UK: Cambridge University Press.

Hoffmann, R. (2012). The experimental economics of religion. *Journal of Economic Surveys*, *27*(5), 813-845. doi: 10.1111/j.1467-6419.2011.00716.x

Honna, J. (2003). *Military politics and democratization in Indonesia.* RoutledgeCurzon. Retrieved from https://books.google.com.au/books?id=Bgj47mofDJYC

Horowitz, D. L. (1985). *Ethnic groups in conflict.* University of California Press.

Hoyer, M., Bault, N., Loerakker, B., & van Winden, F. (2014). Destructive behavior in a fragile public good game. *Economics Letters*, *123*(3), 295-299. doi: 10.1016/j.econlet.2014.02.023

Hsiang, S. M., Burke, M., & Miguel, E. (2013). Quantifying the influence of climate on human conflict. *Science*, *341*(6151), 1235367. doi: 10.1126/science.1235367

Human Rights Watch. (2001, 25 October 2019). *Indonesia: The violence in Central Kalimantan (Borneo).* Human Rights Watch. Retrieved from https://www.hrw.org/legacy/backgrounder/asia/borneo0228.htm

ICEWS. (2018). *Integrated Crisis Early Warning System (ICEWS) dataset.* Retrieved from https://dataverse.harvard.edu/dataverse/icews

Ichino, A., & Winter-Ebmer, R. (2004). The long-run educational cost of World War II. *Journal of Labor Economics*, *22*(1), 57-87. doi: 10.1086/380403

Indra, Nazara, S., Hartono, D., & Sumarto, S. (2019). Roles of income polarization, income inequality and ethnic fractionalization in social conflicts: An empirical study of Indonesian provinces, 2002-2012. *Asian Economic Journal*, *33*(2), 165-190. doi: 10.1111/asej.12179

Islam, A., Mahanta, R., Mandal, R., Nath, H., Ouch, C., & Sarkar, D. (2017). Assam riots in India in 1980s: Examining the behavioural outcomes. *QUT Business School Working Paper No. 052*.

Jakupcak, M., Conybeare, D., Phelps, L., Hunt, S., Holmes, H. A., Felker, B., . . . McFall, M. E. (2007). Anger, hostility, and aggression among Iraq and Afghanistan War veterans reporting PTSD and subthreshold PTSD. *Journal of Traumatic Stress*, *20*(6), 945-954. doi: 10.1002/jts.20258

Jauernig, J., & Uhl, M. (2019). Spite and preemptive retaliation after tournaments. *Journal of Economic Behavior & Organization*, *158*, 328-336. doi: 10.1016/j.jebo.2018.12.001

Jauernig, J., Uhl, M., & Luetge, C. (2016). Competition-induced punishment of winners and losers: Who is the target? *Journal of Economic Psychology*, *57*, 13-25. doi: 10.1016/j.joep.2016.08.004

Jia, R., & Liang, P. (2014). A game of thrones: Power structure and the stability of regimes. In K. Wärneryd (Ed.), *The economics of conflict: Theory and empirical evidence* (p. 79-104). MIT Press Scholarship Online. doi: 10.7551/mitpress/9780262026895.003.0005

Johnson, N. D., & Mislin, A. A. (2011). Trust games: A meta-analysis. *Journal of Economic Psychology*, *32*(5), 865-889. doi: 10.1016/j.joep.2011.05.007

Karakostas, A., & Zizzo, D. J. (2016). Compliance and the power of authority. *Journal of Economic Behavior & Organization*, *124*, 67-80. doi: 10.1016/j.jebo.2015.09.016

Kebede, B., & Zizzo, D. J. (2015). Social preferences and agricultural innovation: An experimental case study from Ethiopia. *World Development*, *67*, 267-280. doi: 10.1016/j.worlddev.2014.10.022

Keen, D. (2000). Incentives and disincentives for violence. In M. Berdal & D. Malone (Eds.), *Greed and grievance: Economic agendas in civil wars* (p. 19-43). Boulder, CO: Lynne Rienner.

Kerschbamer, R. (2015). The geometry of distributional preferences and a non-parametric identification approach: The equality equivalence test. *European Economic Review*, *76*, 85-103. doi: 10.1016/j.euroecorev.2015.01.008

Kessler, E., Ruiz-Martos, M., & Skuse, D. (2012). Destructor game. *Universitat Jaume working paper series 2012/11*. Retrieved from https://ideas.repec.org/p/jau/wpaper/2012-11.html

Kimbrough, E. O., & Reiss, J. P. (2012). Measuring the distribution of spitefulness. *PLoS One*, *7*(8), e41812. doi: 10.1371/journal.pone.0041812

Kimhi, S., Eshel, Y., Zysberg, L., & Hantman, S. (2010). Postwar winners and losers in the long run: Determinants of war related stress symptoms and posttraumatic growth.

Community Ment Health Journal, *46*(1), 10-9. doi: 10.1007/s10597-009-9183-x

Kimhi, S., & Shamai, M. (2006). Are women at higher risk than men? Gender differences among teenagers and adults in their response to threat of war and terror. *Women Health*, *43*(3), 1-19. doi: 10.1300/J013v43n03_01

Kine, P. (2017, May 8, 2017). *Indonesia still restricting foreign media from Papua* (Vol. 2018) (No. 27 August). Retrieved from https://www.hrw.org/news/2017/05/08/Indonesia-still-restricting-foreign-media-papua

Kirchkamp, O., & Mill, W. (2019). Spite vs. risk: Explaining overbidding. *CESifo Working Paper, No. 7631*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3387667

Kis-Katos, K., Liebert, H., & Schulze, G. G. (2011). On the origin of domestic and international terrorism. *European Journal of Political Economy*, *27*, S17-S36. doi: 10.1016/j.ejpoleco.2011.02.002

Kloos, D. (2014). In the name of syariah? Vigilante violence, territoriality, and moral authority in Aceh, Indonesia. *Indonesia*, *98*(1), 59-90. doi: https://doi.org/10.1353/ind.2014.0020

Komnas HAM. (2000). *Laporan lengkap hasil penyelidikan komisi penyelidikan dan pemeriksaan pelanggaran hak asasi manusia di Tanjung Priok (KP3T)*. Komisi Nasional Hak Asasi Manusia (Komnas HAM).

Komnas HAM. (2016). *Komnas HAM dan penyelesaian kasus 27 Juli 1996*. Komisi Nasional Hak Asasi Manusia (Komnas HAM).

Konrad, K. A. (2009). *Strategy and dynamics in contests*. OUP Catalogue.

Konrad, K. A. (2014). Strategic aspects of fighting in alliances. In K. Wärneryd (Ed.), *The economics of conflict: Theory and empirical evidence* (p. 1-22). MIT Press Scholarship Online. doi: 10.7551/mitpress/9780262026895.003.0002

Konrad, K. A., & Morath, F. (2012). Evolutionarily stable in-group favoritism and out-group spite in intergroup conflict. *Journal of Theoretical Biology*, *306*, 61-67. doi: 10.1016/j.jtbi.2012.04.013

Kontras. (2008). *Kasus Talangsari Lampung*. Komisi untuk Orang Hilang dan Korban Tindak Kekerasan. Retrieved from http://www.kontras.org/pers/teks/Kasus%20Talangsari%20Lampung.pdf

Kontras. (2017). *Kasus penculikan dan penghilangan paksa aktivis 1997-1998: Siapa bertanggung jawab?* Komisi untuk Orang Hilang dan Korban Tindak Kekerasan. Retrieved from https://kontras.org/2017/05/23/kasus-penculikan-dan-penghilangan-paksa-aktivis-1997-1998-siapa-bertanggung-jawab/

Krieger, T., & Meierrieks, D. (2010). Terrorism in the worlds of welfare capitalism. *Journal of Conflict Resolution*, *54*(6), 902-939. doi: 10.1177/0022002710367885

Kugler, T., Neeman, Z., & Vulkan, N. (2014). Personality traits and strategic behavior: Anxiousness and aggressiveness in entry games. *Journal of Economic Psychology*, *42*, 136-147. doi: 10.1016/j.joep.2014.02.006

Lacina, B. (2009). Battle deaths dataset 1946-2008 codebook for version 3.0. *Uppsala Conflict Data Program (UCDP), Department of Peace and Conflict Research, Uppsala University*.

Lacina, B., & Gleditsch, N. P. (2005). Monitoring trends in global combat: A new dataset of battle deaths. *European Journal of Population / Revue européenne de Démographie*, *21*(2-3), 145-166. doi: 10.1007/s10680-005-6851-6

Lee-Koo, K. (2012). Gender at the crossroad of conflict: Tsunami and peace in post-2005 Aceh. *Feminist Review*, *101*(1), 59-77. doi: 10.1057/fr.2011.54

Levine, D. K. (1998). Modeling altruism and spitefulness in experiments. *Review of Economic Dynamics*, *1*(3), 593-622. doi: 10.1006/redy.1998.0023

List, J. A. (2007). Field experiments: A bridge between lab and naturally occurring data. *The BE Journal of Economic Analysis & Policy*, *5*(2). doi: 10.2202/1538 -0637.1747

Litvak, P. M., Lerner, J. S., Tiedens, L. Z., & Shonk, K. (2010). Fuel in the fire: How anger impacts judgment and decision-making. In *International handbook of anger* (p. 287-310). doi: 10.1007/978-0-387-89676-2_17

MacLean, L. M. (2004). Mediating ethnic conflict at the grassroots: The role of local associational life in shaping political values in Côte d'Ivoire and Ghana. *The Journal of Modern African Studies*, *42*(4), 589-617. doi: 10.1017/s0022278x04000412

Maitner, A. T., Mackie, D. M., & Smith, E. R. (2006). Evidence for the regulatory function of intergroup emotion: Emotional consequences of implemented or impeded intergroup action tendencies. *Journal of Experimental Social Psychology*, *42*(6), 720-728. doi: 10.1016/j.jesp.2005.08.001

Mancini, L. (2008). Horizontal inequality and communal violence: Evidence from Indonesian districts. In F. Stewart (Ed.), *Horizontal inequalities and conflict* (p. 106-135). Palgrave Macmillan UK.

Mangkusubroto, K., Said, S., Steer, A., & Hellman, J. (2005). *Aceh and Nias one year after the tsunami: The recovery effort and way forward (English)*. World Bank. Retrieved from http://documents.worldbank.org/curated/en/753271468041394131/Aceh-and-Nias-one-year-after-the-tsunami-the-recovery-effort-and-way-forward

Marshall, M. G., Jaggers, K., & Gurr, T. R. (2002). *Polity IV project*. Center for International Development and Conflict Management at the University of Maryland College Park.

Mason, T., Gurses, M., Brandt, P. T., & Michael Quinn, J. (2011). When civil wars recur: Conditions for durable peace after civil wars. *International Studies Perspectives*, *12*(2), 171-189. doi: 10.1111/j.1528-3585.2011.00426.x

Mc Evoy, C., & Hideg, G. (2017). *Global violent deaths 2017*. Geneva, Switzerland: Small Arms Survey, Graduate Institute of International and Development Studies.

McGibbon, R. (2004). *Plural society in peril: Migration, economic change, and the Papua conflict*. Washington, D.C.: East-West Center Washington.

Menezes, T., Silveira-Neto, R., Monteiro, C., & Ratton, J. L. (2013). Spatial correlation between homicide rates and inequality: Evidence from urban neighborhoods. *Economics Letters*, *120*(1), 97-99. doi: 10.1016/j.econlet.2013.03.040

Michalopoulos, S. (2012). The origins of ethnolinguistic diversity. *American Economic Review*, *102*(4), 1508-1539. doi: 10.1257/aer.102.4.1508

Miguel, E., & Roland, G. (2011). The long-run impact of bombing Vietnam. *Journal of Development Economics*, *96*(1), 1-15. doi: 10.1016/j.jdeveco.2010.07.004

Miguel, E., Saiegh, S. M., & Satyanath, S. (2008). National cultures and soccer violence. *NBER Working Paper No. 13968*. doi: 10.3386/w13968

Millar, G. (2018). Engaging ethnographic peace research: Exploring an approach. *International Peacekeeping*, *25*(5), 597-609. doi: 10.1080/13533312.2018.1521700

Miller, M. A. (2008). Konfilik di Aceh: Konteks, pemicu, katalis. In Aguswandi & J. Large (Eds.), *Accord: Rekonfigurasi politik proses damai Aceh*. London: Conciliation Resources.

Mills, C. W. (1999). *The power elite*. Oxford University Press.

Minnesota Population Center. (2015). *Integrated public use microdata series, international: Version 6.4 [dataset].* University of Minnesota. doi: http://doi.org/10.18128/D020.V6.4

Montalvo, J. G., & Reynal-Querol, M. (2005). Ethnic polarization, potential conflict, and civil wars. *American Economic Review*, *95*(3), 796-816. doi: 10.1257/0002828054201468

Moore, W. H., & Lanoue, D. J. (2003). Domestic politics and U.S. foreign policy: A study of cold war conflict behavior. *Journal of Politics*, *65*(2), 376-396. doi: 10.1111/1468-2508.t01-2-00005

Morgan, J., Steiglitz, K., & Reis, G. (2003). The spite motive and equilibrium behavior in auctions. *Contributions in Economic Analysis & Policy*, *2*(1). doi: 10.2202/1538-0645.1102

MSR. (2009). *Multi-stakeholder review of post-conflict programming in Aceh: Identifying the foundations for sustainable peace and development in Aceh.* Retrieved from http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/07/09/000333037_20100709004753/Rendered/PDF/556030WP0v20Bo1l0Report0MSR0English.pdf

Mudhoffir, A. M. (2017). Islamic militias and capitalist development in post-authoritarian Indonesia. *Journal of Contemporary Asia*, *47*(4), 495-514. doi: 10.1080/00472336.2017.1336564

Murshed, S. M., & Tadjoeddin, M. Z. (2009). Revisiting the greed and grievance explanations for violent internal conflict. *Journal of International Development*, *21*(1), 87-111. doi: 10.1002/jid.1478

Murshed, S. M., Tadjoeddin, M. Z., & Chowdhury, A. (2009). Is fiscal decentralization conflict abating? Routine violence and district level government in Java, Indonesia. *Oxford Development Studies*, *37*(4), 397-421. doi: 10.1080/13600810903305224

Nelson, J. A. (2015). Are women really more risk-averse than men? A re-analysis of the literature using expanded methods. *Journal of Economic Surveys*, *29*(3), 566-585. doi: 10.1111/joes.12069

Niederle, M., & Vesterlund, L. (2007). Do women shy away from competition? Do men compete too much? *The Quarterly Journal of Economics*, *122*(3), 1067-1101. doi: 10.1162/qjec.122.3.1067

Nishimura, N., Cason, T. N., Saijo, T., & Ikeda, Y. (2011). Spite and reciprocity in auctions. *Games*, *2*(4), 365-411. doi: 10.3390/g2030365

Nordholt, H. (2002). A genealogy of violence in Indonesia. In F. Colombijn & J. Lindblad (Eds.), *Roots of violence in Indonesia: Contemporary violence in historical perspective.* Leiden: KITLV Press.

North, D. C. (1990). *Institutions, institutional change and economic performance.* Cambridge university press.

North, D. C., Wallis, J. J., & Weingast, B. R. (2009). *Violence and social orders: A conceptual framework for interpreting recorded human history.* Cambridge, UK: Cambridge University Press.

OECD, & European Union. (2018). *Settling in 2018.* Paris/EU, Brussels: OECD Publishing. Retrieved from https://www.oecd-ilibrary.org/content/publication/9789264307216-en doi: 10.1787/9789264307216-en

Oosterbeek, H., Sloof, R., & van de Kuilen, G. (2004). Cultural differences in ultimatum game experiments: Evidence from a meta-analysis. *Experimental Economics*, *7*(2), 171-188. doi: 10.1023/b:exec.0000026978.14316.74

Østby, G., Urdal, H., Tadjoeddin, M. Z., Murshed, S. M., & Strand, H. (2011). Population pressure, horizontal inequality and political violence: A disaggregated study of Indonesian provinces, 1990-2003. *The Journal of Development Studies*, *47*(3), 377-398. doi: 10.1080/00220388.2010.506911

Oster, E. (2019). Unobservable selection and coefficient stability: Theory and evidence. *Journal of Business & Economic Statistics*, *37*(2), 187-204. doi: 10.1080/07350015.2016.1227711

Palmieri, P. A., Canetti-Nisim, D., Galea, S., Johnson, R. J., & Hobfoll, S. E. (2008). The psychological impact of the Israel-Hezbollah War on Jews and Arabs in Israel: The impact of risk and resilience factors. *Social Science & Medicine*, *67*(8), 1208-1216. doi: 10.1016/j.socscimed.2008.06.030

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology*, *90*(5), 751-783. doi: 10.1037/0022-3514.90.5.751

Pierskalla, J. H., & Sacks, A. (2017). Unpacking the effect of decentralized governance on routine violence: Lessons from Indonesia. *World Development*, *90*, 213-228. doi: 10.1016/j.worlddev.2016.09.008

Plümper, T., & Neumayer, E. (2006). The unequal burden of war: The effect of armed conflict on the gender gap in life expectancy. *International Organization*, *60*(03), 723-754. doi: 10.1017/s0020818306060231

Polonio, L., & Coricelli, G. (2019). Testing the level of consistency between choices and beliefs in games using eye-tracking. *Games and Economic Behavior*, *113*, 566-586.

Posner, D. N. (2004). Measuring ethnic fractionalization in Africa. *American Journal of Political Science*, *48*(4), 849-863. doi: 10.1111/j.0092-5853.2004.00105.x

Powell, B., & Wilson, B. J. (2008). An experimental investigation of Hobbesian jungles. *Journal of Economic Behavior & Organization*, *66*(3-4), 669-686. doi: 10.1016/j.jebo.2006.06.011

Prediger, S., Vollan, B., & Herrmann, B. (2014). Resource scarcity and antisocial behavior. *Journal of Public Economics*, *119*, 1-9. doi: 10.1016/j.jpubeco.2014.07.007

Rabin, M. (1993). Incorporating fairness into game theory and economics. *American Economic Review*, *83*(5), 1281-1302. Retrieved from https://www.jstor.org/stable/2117561

Ramachandran, S., Deshpande, O., Roseman, C. C., Rosenberg, N. A., Feldman, M. W., & Cavalli-Sforza, L. L. (2005). Support from the relationship of genetic and geographic distance in human populations for a serial founder effect originating in Africa. *Proceedings of the National Academy of Sciences of the USA*, *102*(44), 15942-15947. doi: 10.1073/pnas.0507611102

Razen, M. (2019). Greed: Taking a deadly sin to the lab. *Journal of Behavioral and Experimental Economics*, *81*, 164-171. doi: 10.1016/j.socec.2019.06.001

Reilly, B. (2001). Democracy, ethnic fragmentation, and internal conflict: confused theories, faulty data, and the "crucial case" of Papua New Guinea. *International Security*, *25*(3), 162-185. doi: 10.1162/016228800560552

Ricklefs, M. (2001). *A history of modern Indonesia since c.1200* (3rd ed.). Hampshire: Palgrave.

Roeder, P. G. (2001, March 8, 2017). *Ethnolinguistic fractionalization (ELF) indices, 1961 and 1985.* Retrieved from http://pages.ucsd.edu/~proeder/elf.htm

Rohner, D., & Saia, A. (2019). Education and conflict: Evidence from a policy experiment in Indonesia. *HiCN Working Paper 304*. Retrieved from https://papers.ssrn

.com/sol3/papers.cfm?abstract_id=3332312

Rohrbaugh, J., & Jessor, R. (1975). Religiosity in youth: A personal control against deviant behavior. *Journal of Personality*, *43*(1), 136-155. doi: 10.1111/j.1467-6494 .1975.tb00577.x

Roth, A. E., Prasnikar, V., Okuno-Fujiwara, M., & Zamir, S. (1991). Bargaining and market behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An experimental study. *The American Economic Review*, 1068-1095. Retrieved from https://www .jstor.org/stable/2006907

Sadrieh, A., & Schröder, M. (2016). Materialistic, pro-social, anti-social, or mixed - A within-subject examination of self- and other-regarding preferences. *Journal of Behavioral and Experimental Economics*, *63*, 114-124. doi: 10.1016/j.socec.2016.05 .009

Saijo, T., & Nakamura, H. (1995). The spite dilemma in voluntary contribution mechanism experiments. *Journal of Conflict Resolution*, *39*, 535-560. doi: 10.1177/ 0022002795039003007

Scacco, A., & Warren, S. S. (2018). Can social contact reduce prejudice and discrimination? Evidence from a field experiment in Nigeria. *American Political Science Review*, *112*(03), 654-677. doi: 10.1017/s0003055418000151

Schelling, T. C. (1978). *Micromotives and macrobehavior*. W. W. Norton.

Schulze, K. E. (2004). *The Free Aceh Movement (GAM): Anatomy of a separatist organization*. Washington, D.C.: East-West Center. Retrieved from https://www.eastwestcenter.org/publications/free-aceh-movement-gam -anatomy-separatist-organization

Schulze, K. E. (2007). From the battlefield to the negotiating table: GAM and the Indonesian Government 1999-2005. *Asian Security*, *3*(2), 80-98. doi: 10.1080/ 14799850701338547

Selten, R. (1967). Die strategiemethode zur erforschung des eingeschränkt rationalen verhaltens im rahmen eines oligopolexperiments. In H. Sauermann (Ed.), *Beiträge zur experimentellen wirtschaftsforschung* (Vol. I, p. 136-168). Tübingen, Germany: J.C.B. Mohr (Siebeck).

Sent, E.-M., & van Staveren, I. (2018). A feminist review of behavioral economic research on gender differences. *Feminist Economics*, *25*(2), 1-35. doi: 10.1080/13545701 .2018.1532595

Sherif, M. (2015). *Group conflict and co-operation: Their social psychology*. Taylor & Francis. Retrieved from https://books.google.com.au/books?id= IoTwCQAAQBAJ

Simons, G. F., & Fennig, C. D. (2017). *Ethnologue: Languages of the world*. SIL International.

Simunovic, D., Mifune, N., & Yamagishi, T. (2013). Preemptive strike: An experimental study of fear-based aggression. *Journal of Experimental Social Psychology*, *49*(6), 1120-1123. doi: 10.1016/j.jesp.2013.08.003

Singer, J. D., & Small, M. (1994). Correlates of war project: International and civil war data, 1816-1992 (ICPSR 9905). *Ann Arbor, MI: Inter-University Consortium for Political and Social Research*.

Slone, M., & Mann, S. (2016). Effects of war, terrorism and armed conflict on young children: A systematic review. *Child Psychiatry & Human Development*, *47*(6), 950-965. doi: 10.1007/s10578-016-0626-7

Slonim, R., & Guillen, P. (2010). Gender selection discrimination: Evidence from a

trust game. *Journal of Economic Behavior & Organization*, *76*(2), 385-405. doi: 10.1016/j.jebo.2010.06.016

Smith, A. C., Skarbek, D. B., & Wilson, B. J. (2011). Anarchy, groups, and conflict: An experiment on the emergence of protective associations. *Social Choice and Welfare*, *38*(2), 325-353. doi: 10.1007/s00355-011-0534-5

Smith, B. (2007). *Hard times in the lands of plenty: Oil politics in Iran and Indonesia.* Cornell University Press. Retrieved from https://books.google.com.au/books?id=yWzmGnU6PqcC

Smith, C. (2015). A stranger in one's own home: Surveillance, space, place, and emotion during the GAM conflict in Aceh. *Indonesia*, *100*. doi: 10.5728/indonesia.100.0053

SNPK. (2019). *Violence incident in Indonesia, January December 2014.* Retrieved from https://microdata.worldbank.org/index.php/catalog/2626/related-materials

Spector, P. E., & Zhou, Z. E. (2013). The moderating role of gender in relationships of stressors and personality with counterproductive work behavior. *Journal of Business and Psychology*, *29*(4), 669-681. doi: 10.1007/s10869-013-9307-8

Spriggs, M. (2010). 'I was so much older then, I'm younger than that now': Why the dates keep changing for the spread of Austronesian languages. In J. Bowden, N. P. Himmelmann, & M. Ross (Eds.), *A journey through Austronesian and Papuan linguistic and cultural space: Papers in honour of Andrew Pawley.* Canberra: Pacific Linguistics.

Stewart, F. (2008). *Horizontal inequalities and conflict: Understanding group violence in multiethnic societies.* Palgrave Macmillan UK. doi: https://doi.org/10.1057/9780230582729

Strachan, A., & Haider, H. (2015). *Gender and conflict: Topic guide.* Birmingham, UK: Governance and Social Development Resource Centre, University of Birmingham.

Tadjoeddin, M. Z. (2002). Anatomy of social violence in the context of transition: The case of Indonesia 1990-2001. *Working Paper 02/01. Jakarta: UNSFIR.* Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=767344

Tadjoeddin, M. Z. (2010). *Political economy of conflict during Indonesia's democratic transition* (Unpublished doctoral dissertation). School of Economics and Finance, University of Western Sydney.

Tadjoeddin, M. Z. (2011). The economic origins of Indonesia's secessionist conflicts. *Civil Wars*, *13*(3), 312-332. doi: 10.1080/13698249.2011.600009

Tadjoeddin, M. Z. (2013). Educated but poor: Explaining localized ethnic violence during Indonesia's democratic transition. *International Area Studies Review*, *16*(1), 24-49. doi: 10.1177/2233865913475434

Tadjoeddin, M. Z., Chowdhury, A., & Murshed, S. M. (2012). Routine violence in Java, Indonesia: Neo-Malthusian and social justice perspectives. In J. Scheffran, M. Brzoska, H. G. Brauch, P. M. Link, & J. Schilling (Eds.), *Climate change, human security and violent conflict: Challenges for societal stability* (p. 633-650). Berlin, Heidelberg: Springer Berlin Heidelberg. doi: 10.1007/978-3-642-28626-1_31

Tadjoeddin, M. Z., & Murshed, S. M. (2007). Socio-economic determinants of everyday violence in Indonesia: An empirical investigation of Javanese districts, 1994-2003. *Journal of Peace Research*, *44*(6), 689-709. doi: 10.1177/0022343307082063

Tadjoeddin, M. Z., Yumna, A., Gultom, S. E., Rakhmadi, M. F., Hidayat, M. F., & Suryahadi, A. (2016). Inequality and stability in democratic and decentralized Indonesia. *The SMERU Research Institute Working Pa-*

per. Retrieved from https://www.smeru.or.id/en/content/inequality-and
-stability-democratic-and-decentralized-indonesia

Tajfel, H., & Turner, J. (1979). An integrative theory of intergroup conflict. *Organizational identity: A reader*, 56-65.

Tajima, Y. (2013). The institutional basis of intercommunal order: Evidence from Indonesia's democratic transition. *American Journal of Political Science*, *57*(1), 104-119. doi: 10.1111/j.1540-5907.2012.00631.x

Taylor, M. (1982). *Community, anarchy and liberty.* Cambridge University Press.

Tedeschi, R. G., & Calhoun, L. G. (2004). Target article: "Posttraumatic growth: Conceptual foundations and empirical evidence". *Psychological Inquiry*, *15*(1), 1-18. doi: 10.1207/s15327965pli1501_01

The National Health and Medical Research Council, The Australian Research Council, & Universities Australia. (2018). *The national statement on ethical conduct in human research 2007 (updated 2018).* Commonwealth of Australia, Canberra: National Health and Medical Research Council.

Thoni, C. (2014). Inequality aversion and antisocial punishment. *Theory and Decision*, *76*, 529-545. doi: 10.1007/s11238-013-9382-3

Tilly, C. (2003). *The politics of collective violence.* Cambridge: Cambridge University Press. doi: 10.1017/CBO9780511819131

Tunçer-Kılavuz, I. (2017). Success or failure in the peace processes of Aceh and Sri Lanka: A comparative study. *Terrorism and Political Violence*, 712-732. doi: 10.1080/09546553.2017.1282860

Urdal, H. (2008). Population, resources, and political violence: A subnational study of India, 1956-2002. *Journal of Conflict Resolution*, *52*(4), 590-617. doi: 10.1177/0022002708316741

Vahabi, M. (2009). A critical review of strategic conflict theory and socio-political instability models. *Revue d'économie politique*, *119*(6), 817-858.

van Dijk, C. (1981). *Rebellion under the banner of Islam.* Brill. doi: 10.1163/9789004287259

Vanhanen, T. (1999). Domestic ethnic conflict and ethnic nepotism: A comparative analysis. *Journal of Peace Research*, *36*(1), 55-73. doi: 10.1177/0022343399036001004

van Lange, P. A. M. (2000). Beyond self-interest: A set of propositions relevant to interpersonal orientations. *European Review of Social Psychology*, *11*(1), 297-331. doi: 10.1080/14792772043000068

van Veldhuizen, R. (2013). The influence of wages on public officials' corruptibility: A laboratory investigation. *Journal of Economic Psychology*, *39*, 341-356. doi: 10.1016/j.joep.2013.09.009

Varshney, A. (2008). Analyzing collective violence in Indonesia: An overview. *Journal of East Asian Studies*, *8*(3), 341-359. Retrieved from https://www.jstor.org/stable/23418630

Varshney, A., Tadjoeddin, M. Z., & Panggabean, R. (2008). Creating datasets in information-poor environments: patterns of collective violence in Indonesia, 19902003. *Journal of East Asian Studies*, *8*(3), 361-394.

Viceisza, A. C. G. (2016). Creating a lab in the field: Economics experiments for policy-making. *Journal of Economic Surveys*, *30*(5), 835-854. doi: 10.1111/joes.12118

Vicente, P. C., & Vilela, I. (2019). Preventing violent Islamic radicalization: Behavioral evidence from northern Mozambique. *Nova School of Business and Economics Working Paper, Universidade Nova de Lis-*

boa. Retrieved from https://novafrica.org/wp-content/uploads/2019/05/PedroVicente_Preventing-Violent-Islamic-Radicalization.pdf

Vickers, A. (2005). *A history of modern Indonesia.* Cambridge, UK: Cambridge University Press.

Victoria, S. G. o. (2019, 10 November 2019). *Melbourne's Indonesian community.* Retrieved from https://liveinmelbourne.vic.gov.au/discover/multicultural-communities/indonesian

Voors, M. J., Nillesen, E. E. M., Verwimp, P., Bulte, E. H., Lensink, R., & Soest, D. P. V. (2012). Violent conflict and behavior: A field experiment in Burundi. *American Economic Review*, *102*(2), 941-964. doi: 10.1257/aer.102.2.941

Waldmann, P. (2003). Civil wars. In W. Heitmeyer & J. Hagan (Eds.), *International handbook of violence research* (p. 291-308). Springer Science+Business Media, B.V.

Wärneryd, K. (2014). *The economics of conflict: Theory and empirical evidence.* MIT Press Scholarship Online. doi: 10.7551/mitpress/9780262026895.001.0001

Weber, M. (2014). Class, status, party. In D. B. Grusky (Ed.), *Social stratification: Class, race, and gender in sociological perspective.* Westview Press.

Weidmann, N. B., Rød, J. K., & Cederman, L. E. (2010). Representing ethnic groups in space: A new dataset. *Journal of Peace Research*, *47*(4), 491-499. doi: 10.1177/0022343310368352

Werner, K., & Lambsdorff, J. G. (2019). Emotional numbing and lessons learned after a violent conflict - experimental evidence from Ambon, Indonesia. *The Journal of Development Studies*, 1-15. doi: 10.1080/00220388.2019.1590550

Wertheim, W. F. (1966). Indonesia before and after the Untung Coup. *Pacific Affairs*, *39*(1/2), 115-127. doi: 10.2307/2755185

Witmer, F. D., Linke, A. M., O'Loughlin, J., Gettelman, A., & Laing, A. (2017). Subnational violent conflict forecasts for sub-Saharan Africa, 2015-65, using climate-sensitive models. *Journal of Peace Research*, *54*(2), 175-192. doi: 10.1177\%2F0022343316682064

World Bank. (2006). *Reconstruction of Aceh Land Administration System (RALAS) (English).* World Bank Group. Retrieved from http://documents.worldbank.org/curated/en/334431468259752534/Reconstruction-of-Aceh-Land-Administration-System-RALAS

World Bank. (2008). *Aceh conflict monitoring update (January - February 2008) (English).* Retrieved from http://documents.worldbank.org/curated/en/491391468268823780/Aceh-conflict-monitoring-update-January-February-2008

World Bank. (2016). *Indonesia's rising divide.* World Bank Group. Retrieved from http://documents.worldbank.org/curated/en/267671467991932516/Indonesias-rising-divide

World Bank. (2018). *National violence monitoring system 2014.* Retrieved from http://microdata.worldbank.org/index.php/catalog/2626

Zeballos, E. (2018). Destructive actions and productivity: Experimental evidence on interpersonal comparisons among dairy farmers in Bolivia. *Journal of Behavioral and Experimental Economics*, *76*, 82-94. doi: 10.1016/j.socec.2018.08.005

Zeitzoff, T. (2014). Anger, exposure to violence, and intragroup conflict: A "lab in the field" experiment in southern Israel. *Political Psychology*, *35*(3), 309-335. doi: 10.1111/pops.12065

Zhang, J., Brown, E., & Xie, H. (2019). Effect of religious priming in prosocial and

destructive behaviour. *Pacific Economic Review*. doi: 10.1111/1468-0106.12293

Zhang, L., & Ortmann, A. (2016). Pro-social or anti-social, or both? A within- and between-subjects study of social preferences. *Journal of Behavioral and Experimental Economics*, *62*, 23-32. doi: 10.1016/j.socec.2016.03.001

Zinoman, P., & Peluso, N. L. (2002). Rethinking aspects of political violence in twentieth-century Indonesia and East Timor. *Asian Survey*, *42*(4), 545-549. doi: 10.1525/as.2002.42.4.545

Zizzo, D. J. (2003). Money burning and rank egalitarianism with random dictators. *Economics Letters*, *81*(2), 263-266. doi: 10.1016/s0165-1765(03)00190-3

Zizzo, D. J., & Fleming, P. (2011). Can experimental measures of sensitivity to social pressure predict public good contribution? *Economics Letters*, *111*(3), 239-242. doi: 10.1016/j.econlet.2011.02.021

Zizzo, D. J., & Oswald, A. J. (2001). Are people willing to pay to reduce others' incomes? *Annales d'Economie et de Statistique*, *63/64*, 39-65. doi: 10.2307/20076295

Appendices

Appendix A

Tables

Table A.1: Selected cross-country studies on conflict antecedents

Source	Coverage	Dependent variable	Cultural diversity and institutional regressors	Main findings
(1)	(2)	(3)	(4)	(5)
Easterly (2001)	1960-1990 (321 country-years)	War casualties per capita, genocide dummy	ELF (data from ANM), institutional quality index, political rights	Quality of institution cancelled out the effect of ethnic diversity in explaining war casualties and genocide.
Elbadawi and Sambanis (2002)	1960-1999 (750 five-year-countries)	Dummy civil war prevalence (onset and/or continuation)	ELF (ANM), squared ELF, ethnic dominance (Vanhanen, 1999), ethnic heterogeneity, Polity, squared Polity	Low income was associated with higher probability of conflict. Institutional quality and ELF had no direct effect on civil war prevalence. Probability of civil war was higher in countries with both low level of democracy and ethnic heterogeneity.
Fearon and Laitin (2003)	1945-1999 (6,610 country-years)	Dummy violent civil conflict	ELF, share of population belonging to the largest ethnic group, number of distinct languages spoken by groups exceeding 1 per cent of the population, democracy (Polity IV)	Income was a strong predictor of civil conflict. Ethnic heterogeneity did not explain conflict. Past (1950s) conflicts contributed to recent (1990s) civil conflicts. Democracy had no effect in predicting civil conflict.
Collier and Hoeffler (2004)	1960-1999 (750 five-year-countries)	Dummy civil war (internal conflict with at least 1,000 casualties)	ELF (ANM), religious fractionalisation, ethnic polarisation, ethnic dominance, political repression (Polity III), political openness	Greed factors (income) predicted the probability of civil war occurrence better than did grievance factors (e.g., ethnic diversity). The openness of political institutions was associated with a lower probability of conflict.
Fearon (2004)	1945-1999	Duration of civil war (years)	Ethnic fractionalisation, democracy (Polity IV)	Ethnic fractionalisation did not affect duration of wars, but wars between dominant and invasive ethnic groups and peripheral ethnic groups tended to last longer. Democracy had no effect in predicting civil conflict.
Montalvo and Reynal-Querol (2005)	1960-1999 in 138 countries	Dummy civil war (UCDP/PRIO)	ELF, ethnic polarisation, religious fractionalisation, religious polarisation, democracy	In predicting civil war onset, ethnic and religious polarisation captured ethnic heterogeneity better than did ELF. No effect of democracy.
Cederman and Girardin (2007)	1945-1999 in Eurasian and North African countries	Dummy dyadic ethnic conflict (conflict with at least 25 people killed; UCDP/PRIO)	Ethnic and religious fractionalisation, ethnic exclusion index, democracy (Polity IV)	Countries with a higher degree of ethnonationalist configuration had a higher likelihood to have conflict. The probability of ethnic conflict was negatively associated with income. Democracy was positively correlated with civil war onset.

Source	Coverage	Dependent variable	Cultural diversity and institutional regressors	Main findings
(1)	(2)	(3)	(4)	(5)
Fearon et al. (2007)	1945-1999 in Eurasian and North African countries; 1945-1999 in 161 countries	Civil war onset	Ethnic fractionalisation, democracy, minority rule (by ethnic group in power or by head of state)	The study was a response to Cederman and Girardin (2007) study. Countries led by minority ethnic groups were only slightly more likely to encounter civil wars, but this was subject to the very low numbers of minority-ruled countries that experienced civil wars.
Buhaug et al. (2008)	1946-1999 in Eurasia and North Africa (33,882 geo-referenced polygons)	Dummy dyadic ethnic conflict (conflict with at least 25 people killed; UCDP/PRIO)	Demographic balance, democracy (Polity IV)	The probability of ethnic conflict was positively associated with the peripheral groups relative size, distance from the capital and democracy. Prolonged peaceful years were associated with lower ethnic conflict occurrence.
Weidmann, Rød, and Cederman (2010)	1946-1989 (8,969 geo-referenced polygons)	Dummy dyadic ethnic conflict (conflict with at least 25 people killed; UCDP/PRIO)	Power balance	Ethnic groups with high power balance were more likely to engage in conflict with the government.
Mason et al. (2011)	1945-1999 (1,174 peace-years)	Duration of peace after civil war	Ethnic fractionalisation, squared ethnic fractionalisation, Polity IV, squared Polity IV	There was a time-varying effect of past conflict outcomes and a non-linear effect of ethnic fractionalisation on peace duration. Limited support for the role of democracy in sustained peace.
Desmet et al. (2012)	1945-1999 in 149 countries	Onset of civil war	Linguistic fractionalisation and polarisation with group distance, religious fractionalisation, legal origins	Deep cultural divide/cleavage was important in explaining conflicts, while shallow cultural divide was important in explaining economic growth.
Esteban et al. (2012)	1960-2008 in 138 countries	Dummy internal conflict (UCDP/PRIO)	Ethnic fractionalisation, polarisation, Greenberg-Gini index, democracy, lack of executive constraints, autocracy, political rights, civil liberty	Ethnic polarisation and fractionalisation were positively and significantly associated with the likelihood of conflict. There were no significant institutional variables that can predict internal conflict.

Note: Sorted by year of publication.

Table A.2: Number of districts/municipalities in NVMS, 2005-2014

Province	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Aceh	23	23	23	23	23	23	23	23	23	23
Bali										9
Banten	3	3	3	3	3	3	3	3	3	8
Bengkulu										10
DI Yogyakarta										5
DKI Jakarta	6	6	6	6	6	6	6	6	6	6
Gorontalo										6
Jambi										11
Jawa Barat	5	5	5	5	5	5	5	5	5	26
Jawa Tengah										35
Jawa Timur	38	38	38	38	38	38	38	38	38	38
Kalimantan Barat	14	14	14	14	14	14	14	14	14	14
Kalimantan Selatan										13
Kalimantan Tengah	14	14	14	14	14	14	14	14	14	14
Kalimantan Timur								9	9	9
Kalimantan Utara								5	5	5
Kep. Bangka Belitung										7
Kep. Riau										7
Lampung	14	14	14	14	14	14	14	14	14	14
Maluku	11	11	11	11	11	11	11	11	11	11
Maluku Utara	9	9	9	9	9	9	9	9	9	9
Nusa Tenggara Barat	10	10	10	10	10	10	10	10	10	10
Nusa Tenggara Timur	21	21	21	21	21	21	21	21	21	21
Papua	26	28	28	28	28	29	29	29	29	29
Papua Barat	10	10	10	10	10	10	10	10	10	10
Riau										11
Sulawesi Barat										5
Sulawesi Selatan	24	24	24	24	24	24	24	24	24	24
Sulawesi Tengah	11	11	11	11	11	11	11	11	11	11
Sulawesi Tenggara										12
Sulawesi Utara	15	15	15	15	15	15	15	15	15	15
Sumatera Barat										19
Sumatera Selatan										15
Sumatera Utara	33	33	33	33	33	33	33	33	33	33
Total	287	289	289	289	289	290	290	304	304	495

Table A.3: Variables definitions and sources

Variable name in Stata	Definition	Sources
lndv_pop	Log non-domestic violent incidents per million people	
lndcv_pop	Log non-domestic collective violent incidents per million people	
lkill_ndv_pop	Log non-domestic violent incidents with casualties per million people	NVMS and population census
ndv	Number of non–domestic violent incidents	
violent_conflict	Number of violent conflict	
kill_vio_conf	Number of people killed from violent conflict	
gini_05_1014	Greenberg-Gini index ($\delta = 0.05$)	
gini_5_1014	Greenberg-Gini index ($\delta = 0.5$)	Population census and
f_1014	Ethnolinguistic fractionalisation index	Ethnologue
p_1014	Ethnolinguistic polarisation index	
rf_10	Religious fractionalisation	
efi_1014	Ethnic fractionalisation index	
epoi_1014	Ethnic polarisation index	
javanese_prop_1014	Share of Javanese	Census
urban	Urban district (>50% of population living in urban areas)	
lpop	Log of population	
ratio_gini	Gini ratio for income inequality	
hdi_new	Human Development Index	BPS
lrev_tot_bn	Log total government revenue	
unemployment_rate	Unemployment rate	
pov_rate	Poverty rate	World Bank's INDO-DAPOER
service_provision_ip	Index of public service delivery	
rd_iw_new	Relative deprivation in income-welfare gap	World Bank's INDO-DAPOER
lgrdp	Log real GDP (including oil & gas)	and BPS
trust	Trust index	Susenas 2014 Module on Social Resilience
worship_place	Number of worship place	Podes
new_district	Dummy for new district (=1 if created in 2000-2014)	Ministry of Home Affairs and Ministry of Finance
distance_taiwan	Distance from Taiwan	
distance_africa	Distance from Addis Ababa	GADM
elev_mean	Mean elevation	
elev_stdev	Variation in elevation	
latitude	Absolute latitude	CGIAR-SRTM
area	Area ('000 km^2)	

Notes: Collective violent incident is defined as events that involved at least 10 people. Violent conflict includes resource conflict, governance conflict, electoral conflict, identity (ethno-communal) conflict, vigilante and separatism.

Table A.4: Distribution of ethnolinguistic groups by region in 2010

Region	Largest ethnolinguistic group (share)	No. of local languages	No. of pairs	Mean of				
				d_{mn}	G	F	P	EFI
Java-Bali	Javanese (48%)	8	8	0.312	0.032	0.162	0.013	0.182
Kalimantan	Banjar (28%)	53	1,378	0.078	0.076	0.586	0.017	0.674
Maluku	Ambonese (47%)	79	3,081	0.357	0.435	0.514	0.15	0.722
Nusa Tenggara	Sasak (32%)	74	2,701	0.428	0.066	0.431	0.02	0.355
Papua	Indonesian (44%)	149	11,026	0.815	0.222	0.435	0.068	0.665
Sulawesi	Bugis (19%)	97	4,656	0.079	0.102	0.475	0.04	0.462
Sumatera	Indonesian (27%)	41	214	0.434	0.047	0.426	0.015	0.508

Notes: In each region, languages originated from different regions were excluded in the calculation of language pairs. Number of languages was taken from Ethnologue and calculated after matching for different language names and availability of speakers from census data. Indonesian language has the most speakers in Papua because of the large number of migrants and the many but small ethnic groups in the region. The language also has the largest number of speakers in Sumatera because it was based on the Malay language originated from the region. $\delta = 0.05$ was used for the calculation of G and P. Source: Calculated from census 2010 and Ethnologue.

Table A.5: First-stage regressions results (dependent variable: log nondomestic violence per capita)

	Model 4		Model 5		Model 6		Model 7	
	G	G^2	G	G^2	G	G^2	G	G^2
Distance from Taiwan	-0.000257	-3.61e-05			0.000173	0.000117	0.000572**	0.000226*
	(0.000216)	(0.000102)			(0.000227)	(0.000118)	(0.000238)	(0.000121)
Absolute latitude			-0.126*	-0.0539	-1.358***	-0.546***	-1.211***	-0.501***
			(0.0707)	(0.0370)	(0.323)	(0.179)	(0.325)	(0.176)
Distance from Taiwan x Absolute latitude					0.000398***	0.000161***	0.000340***	0.000138***
					(9.09e-05)	(4.95e-05)	(8.87e-05)	(4.72e-05)
Squared distance from Taiwan	3.07e-08	1.97e-09			-4.87e-08	-2.75e-08	-1.07e-07***	-4.15e-08**
	(3.26e-08)	(1.55e-08)			(3.62e-08)	(1.89e-08)	(3.76e-08)	(1.91e-08)
Squared absolute latitude			0.0645	0.0367	-0.104*	-0.0367	-0.114**	-0.0464*
			(0.0607)	(0.0315)	(0.0561)	(0.0272)	(0.0480)	(0.0236)
Distance from Africa							-0.000585*	3.71e-05
							(0.000302)	(0.000162)
Squared distance from Africa							2.65e-08**	2.20e-10
							(1.18e-08)	(6.27e-09)
Trust index	-0.168***	-0.0609**	-0.117**	-0.0421	-0.154***	-0.0621**	-0.0533	-0.0215
	(0.0538)	(0.0249)	(0.0551)	(0.0262)	(0.0576)	(0.0271)	(0.0550)	(0.0264)
Gini ratio for income inequality	0.163	0.00966	0.284**	0.0606	0.147	-0.00524	-0.208*	-0.182**
	(0.130)	(0.0696)	(0.117)	(0.0619)	(0.126)	(0.0687)	(0.125)	(0.0757)
Human Development Index	-0.00347***	-0.00128**	-0.00339***	-0.00109*	-0.00293**	-0.00102*	0.00208	0.00124*
	(0.00128)	(0.000579)	(0.00131)	(0.000599)	(0.00128)	(0.000583)	(0.00138)	(0.000682)
Unemployment rate	0.854***	0.401***	0.798***	0.373***	0.689***	0.343***	0.595***	0.296***
	(0.210)	(0.101)	(0.206)	(0.101)	(0.220)	(0.107)	(0.171)	(0.0859)
Log district GDP	-0.0283***	-0.0146***	-0.0274***	-0.0144***	-0.0297***	-0.0156***	-0.0163***	-0.00937***
	(0.00608)	(0.00311)	(0.00611)	(0.00310)	(0.00606)	(0.00316)	(0.00499)	(0.00249)
Urban district	-0.00302	-0.00392	-0.00252	-0.00543	-0.000835	-0.00400	-0.0217*	-0.0134**
	(0.0137)	(0.00616)	(0.0140)	(0.00632)	(0.0138)	(0.00624)	(0.0129)	(0.00627)
Constant	1.427***	0.471***	0.759***	0.301***	0.859**	0.298	2.792	-0.633
	(0.357)	(0.170)	(0.174)	(0.0826)	(0.376)	(0.191)	(1.837)	(1.015)
Observations	495	495	495	495	495	495	495	495

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. The term 'Model' in the first row refers to the column number of Table 4.4.

Table A.6: Negative binomial regressions (dependent variable: number of non-domestic violence)

	(1)	(2)	(3)
G	0.580	6.506***	4.227***
	(0.613)	(1.830)	(1.319)
G^2		-12.53***	-7.346***
		(3.161)	(2.385)
Log population	0.850***	0.842***	0.663***
	(0.0651)	(0.0632)	(0.0539)
Trust index			-0.458
			(0.382)
Gini ratio for income inequality			2.464**
			(1.015)
HDI			0.0692***
			(0.00986)
Log unemployment rate			0.856
			(1.629)
Log district GDP per capita			0.0540
			(0.0793)
Urban district			0.156
			(0.114)
Constant	-7.104***	-7.247***	-9.408***
	(0.845)	(0.844)	(1.329)
$\ln(\alpha)$	-0.0298	-0.0712	-0.469***
	(0.0959)	(0.0986)	(0.0684)
Observations	495	495	495

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. Significance of $\ln(\alpha)$ indicates over-dispersion in the outcome data.

Table A.7: Payoff destruction experiment data for the meta-analysis

Source	Region	Burn rate	JoD	Students	One-shot	Costly	WP	n	Σn	w
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Abbink and Herrmann (2011)	Europe	10.80	1	1	1	1	0	69	131	0.53
Abbink and Herrmann (2011)	Europe	25.80	1	1	1	1	0	62	131	0.47
Abbink and Sadrieh (2009)	Europe	23.95	1	1	0	0	0	40	40	1.00
Almås et al. (2019)	America	6.00	1	1	1	0	1	864	1859	0.46
Almås et al. (2019)	Africa	18.00	1	1	1	0	1	995	1859	0.54
Baillon et al. (2013)	Europe	38.78	1	1	1	1	0	51	153	0.33
Baillon et al. (2013)	Europe	17.65	1	1	1	1	0	49	153	0.32
Baillon et al. (2013)	Europe	18.87	1	1	1	1	0	53	153	0.35
Basurto et al. (2016)	America	54.00	1	0	1	1	0	127	127	1.00
Bauer, Cahlíková, Celik Katreniak, et al. (2018)	Europe	32.00	1	0	1	1	0	222	1411	0.16
Bauer, Cahlíková, Celik Katreniak, et al. (2018)	Europe	42.00	1	0	1	1	0	346	1411	0.25
Bauer, Cahlíková, Celik Katreniak, et al. (2018)	Africa	53.00	1	0	1	1	0	426	1411	0.30
Bauer, Cahlíková, Celik Katreniak, et al. (2018)	Africa	59.00	1	0	1	1	0	417	1411	0.30
Bauer, Cahlíková, Chytilová, and Zelinsky (2018)	Europe	44.50	1	0	1	1	0	148	740	0.20
Bauer, Cahlíková, Chytilová, and Zelinsky (2018)	Europe	69.50	1	0	1	1	0	108	740	0.15
Bauer, Cahlíková, Chytilová, and Zelinsky (2018)	Europe	22.00	1	0	1	1	0	188	740	0.25
Bauer, Cahlíková, Chytilová, and Zelinsky (2018)	Europe	64.00	1	0	1	1	0	66	740	0.09
Bauer, Cahlíková, Chytilová, and Zelinsky (2018)	Europe	21.00	1	0	1	1	0	82	740	0.11
Bauer, Cahlíková, Chytilová, and Zelinsky (2018)	Europe	77.50	1	0	1	1	0	42	740	0.06
Bauer, Cahlíková, Chytilová, and Zelinsky (2018)	Europe	23.50	1	0	1	1	0	106	740	0.14
Diamond and Blackwell (2017)	America	22.00	1	1	1	0	0	18	74	0.24
Diamond and Blackwell (2017)	America	0.00	1	1	1	0	0	21	74	0.28
Diamond and Blackwell (2017)	America	17.00	1	1	1	0	0	35	74	0.47
Dickinson and Masclet (2019)	Europe	33.33	1	1	1	1	1	27	123	0.22
Dickinson and Masclet (2019)	Europe	33.33	1	1	1	1	1	96	123	0.78
Dickinson et al. (2018)	Europe	16.66	0	1	1	1	0	12	48	0.25
Dickinson et al. (2018)	Europe	33.33	0	1	1	1	0	12	48	0.25
Dickinson et al. (2018)	Europe	58.33	0	1	1	1	0	12	48	0.25
Dickinson et al. (2018)	Europe	75.00	0	1	1	1	0	12	48	0.25
D. Fehr (2018)	Europe	20.00	0	1	1	1	0	88	248	0.35
D. Fehr (2018)	Europe	28.00	0	1	1	1	0	88	248	0.35
D. Fehr (2018)	Europe	42.00	0	1	1	1	0	72	248	0.29

Source	Region	Burn rate	JoD	Students	One-shot	Costly	WP	n	Σn	w
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Gangadharan et al. (2018)	Asia-Oceania	19.40	0	1	0	1	1	160	370	0.43
Gangadharan et al. (2018)	Asia-Oceania	9.50	0	1	0	1	1	210	370	0.57
Gangadharan et al. (2019)	America	16.10	0	1	0	1	0	66	186	0.35
Gangadharan et al. (2019)	America	10.30	0	1	0	1	0	60	186	0.32
Gangadharan et al. (2019)	America	10.60	0	1	0	1	0	60	186	0.32
Jauernig and Uhl (2019)	Europe	52.20	1	1	1	0	0	23	286	0.08
Jauernig and Uhl (2019)	Europe	26.80	1	1	1	0	0	41	286	0.14
Jauernig and Uhl (2019)	Europe	22.10	1	1	1	0	0	222	286	0.78
Jauernig et al. (2016)	Europe	40.00	1	1	1	0	0	70	218	0.32
Jauernig et al. (2016)	Europe	48.53	1	1	1	0	0	68	218	0.31
Jauernig et al. (2016)	Europe	35.00	1	1	1	0	0	80	218	0.37
Karakostas and Zizzo (2016)	Europe	37.69	1	1	0	1	0	390	390	1.00
Kebede and Zizzo (2015)	Africa	8.27	0	0	1	1	0	240	360	0.67
Kebede and Zizzo (2015)	Africa	11.89	0	1	1	1	0	60	360	0.17
Kebede and Zizzo (2015)	Africa	5.47	0	1	1	1	0	60	360	0.17
Kessler et al. (2012)	Europe	15.50	1	1	1	0	1	606	606	1.00
Prediger et al. (2014)	Africa	23.30	1	0	1	1	0	60	120	0.50
Prediger et al. (2014)	Africa	40.00	1	0	1	1	0	60	120	0.50
Vicente and Vilela (2019)	Africa	24.00	1	0	1	1	1	353	353	1.00
Zeballos (2018)	America	55.00	0	0	1	1	0	285	285	1.00
Zeitzoff (2014)	Europe	68.63	1	0	1	1	0	51	98	0.52
Zeitzoff (2014)	Europe	57.45	1	0	1	1	0	47	98	0.48
J. Zhang et al. (2019)	America	9.38	1	1	1	0	0	64	124	0.52
J. Zhang et al. (2019)	America	15.00	1	1	1	0	0	60	124	0.48
L. Zhang and Ortmann (2016)	Asia-Oceania	28.00	1	1	1	0	0	47	143	0.33
L. Zhang and Ortmann (2016)	Asia-Oceania	15.00	1	1	1	0	0	48	143	0.34
L. Zhang and Ortmann (2016)	Asia-Oceania	17.00	1	1	1	0	0	48	143	0.34
Zizzo (2003)	Europe	72.41	0	1	1	1	0	87	87	1.00
Zizzo and Fleming (2011)	Europe	55.09	0	1	1	1	0	216	216	1.00
Zizzo and Oswald (2001)	Europe	62.50	0	1	1	1	0	116	116	1.00

Notes: Average burn rate and total observation were used for studies that did not indicate the number of observations per experimental treatment. WP = working paper.

Table A.8: Counts of antisocial behaviour and mean of anger, Melbourne

Number of burning decisions	0	1	2	3	4	Σ
Females	55	5	6	1	2	69
	16.61	*27.00*	*18.25*	*17.00*	*22.00*	*17.00*
Males	51	1	4	1	1	58
	15.62	*18.00*	*17.33*	*22.00*	*9.00*	*15.84*
Total	106	6	10	2	3	127
	16.09	*19.50*	*17.70*	*19.50*	*13.33*	*16.37*

Notes: Numbers in italic refer to mean score of anger. Decisions against computer co-participant were excluded from the table.

Table A.9: Panel regression on the role of aggression, Melbourne (dependent variable: burning decision)

	(1)	(2)	(3)	(4)
Female partner	-0.974**	-0.971**	-0.975**	-0.971**
	(0.402)	(0.401)	(0.402)	(0.401)
Javanese partner	-0.136	-0.135	-0.137	-0.134
	(0.179)	(0.178)	(0.179)	(0.179)
Female	1.551	-0.673	1.603	-1.898
	(2.189)	(2.107)	(2.279)	(2.475)
Hostility	0.0112			
	(0.0563)			
Female × hostility	-0.107			
	(0.102)			
Physical		0.00225		
		(0.0636)		
Female × physical		0.000450		
		(0.102)		
Verbal			-0.0838	
			(0.0946)	
Female × verbal			-0.236	
			(0.223)	
Aggression index				0.00128
				(0.0216)
Female × aggression				0.0179
				(0.0356)
Negative belief	2.373***	2.397***	2.547***	2.444***
	(0.644)	(0.657)	(0.678)	(0.667)
Javanese	-0.204	-0.323	-0.317	-0.362
	(0.576)	(0.556)	(0.547)	(0.573)
Age	0.0273	0.0312	0.0249	0.0340
	(0.0503)	(0.0503)	(0.0512)	(0.0493)
Muslim	-0.139	-0.0608	0.00914	-0.0350
	(0.519)	(0.527)	(0.533)	(0.513)
Married	-1.020	-1.066	-0.853	-1.106
	(0.721)	(0.700)	(0.692)	(0.709)
Income >AUD 2,000	0.101	0.189	0.258	0.186
	(0.546)	(0.556)	(0.564)	(0.562)
Student	-1.865***	-1.769***	-1.691***	-1.758***
	(0.654)	(0.596)	(0.621)	(0.604)
Constant	-1.630	-1.682	-0.836	-1.807
	(1.954)	(1.990)	(1.976)	(2.119)
$\ln(\hat{\sigma_v}^2)$	0.877*	0.886*	0.832*	0.880*
	(0.489)	(0.501)	(0.476)	(0.509)
Observations	500	500	500	500
Number of id	125	125	125	125

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. Partner gender was relative to male co-participant while partner ethnic was relative to non-Javanese.

Table A.10: Panel regression on artefact effects, Melbourne (dependent variable: burning decision)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female partner	-0.973**	-0.970**	-0.976**	-0.972**	-0.973**	-0.972**	-0.973**
	(0.405)	(0.405)	(0.403)	(0.404)	(0.403)	(0.404)	(0.405)
Javanese partner	-0.133	-0.137	-0.131	-0.131	-0.132	-0.132	-0.131
	(0.180)	(0.178)	(0.179)	(0.180)	(0.180)	(0.180)	(0.181)
Female	-0.954*	-0.887*	-0.845*	-0.924*	-0.884*	-0.950*	-0.882*
	(0.536)	(0.503)	(0.502)	(0.515)	(0.517)	(0.533)	(0.519)
Negative belief	2.637***	2.491***	2.545***	2.593***	2.585***	3.697	2.539***
	(0.687)	(0.606)	(0.647)	(0.665)	(0.663)	(2.345)	(0.674)
Javanese	-1.024	-0.0558	-0.122	-0.0172	-0.0577	-0.145	-0.00529
	(2.638)	(0.524)	(0.531)	(0.573)	(0.557)	(0.551)	(0.576)
Age	0.0250	0.0303	0.0232	0.0179	-0.0832	0.0159	0.0183
	(0.0491)	(0.0451)	(0.0445)	(0.0463)	(0.189)	(0.0481)	(0.0482)
Muslim	-0.153	-3.219	-0.184	-0.255	-0.191	-0.148	-0.302
	(0.648)	(2.182)	(0.528)	(0.562)	(0.559)	(0.511)	(0.574)
Married	-1.207*	-1.204*	-3.883*	-1.158*	-1.123	-1.165*	-1.206*
	(0.663)	(0.630)	(2.039)	(0.669)	(0.684)	(0.672)	(0.651)
Income >AUD 2,000	0.0902	0.000778	0.0957	-0.973	0.0551	-0.00241	0.0334
	(0.536)	(0.500)	(0.526)	(2.007)	(0.527)	(0.533)	(0.521)
Student	-2.039***	-2.039***	-2.135***	-2.065***	-2.070***	-2.034***	-4.158**
	(0.661)	(0.617)	(0.646)	(0.647)	(0.653)	(0.659)	(2.061)
Anger	0.115*	0.0130	0.0450	0.107	-0.0357	0.161**	0.0600
	(0.0666)	(0.0859)	(0.0908)	(0.0746)	(0.356)	(0.0708)	(0.0869)
Javanese × anger	0.0512						
	(0.145)						
Muslim × anger		0.179					
		(0.122)					
Married × anger			0.153				
			(0.113)				
Income >AUD 2,000 × anger				0.0574			
				(0.116)			
Age × anger					0.00549		
					(0.0104)		
Negative belief × anger						-0.0665	
						(0.136)	
Student × anger							0.121
							(0.118)
Constant	-3.009	-1.390	-1.637	-2.606	-0.0264	-3.516*	-1.789
	(1.893)	(1.985)	(2.153)	(2.115)	(6.383)	(2.040)	(2.429)
$\ln(\hat{\sigma_v}^2)$	0.802	0.696	0.720	0.789	0.778	0.799	0.789
	(0.522)	(0.507)	(0.538)	(0.528)	(0.531)	(0.523)	(0.529)
Observations	500	500	500	500	500	500	500
Number of id	125	125	125	125	125	125	125

Notes: Robust standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$. Partner gender was relative to male co-participant while partner ethnic was relative to non-Javanese.

Table A.11: Panel regression on artefacts effects, Aceh (dependent variable: burning decision)

	(1)	(2)	(3)	(4)	(5)	(6)
Javanese partner	0.203	0.507**	0.494**	0.494**	0.494**	0.495**
	(0.360)	(0.237)	(0.230)	(0.230)	(0.230)	(0.230)
Conflict experience (injured or killed)	0.285	1.007*	0.752	1.304	0.980	0.732
	(0.551)	(0.578)	(0.605)	(1.603)	(1.606)	(0.490)
Female	0.200	0.184	0.184	0.185	0.193	0.132
	(0.465)	(0.474)	(0.468)	(0.468)	(0.461)	(0.469)
Female partner	0.117	0.612*	0.119	0.118	0.118	0.119
	(0.212)	(0.360)	(0.211)	(0.211)	(0.211)	(0.211)
Negative belief	2.134***	2.181***	2.371***	2.092***	2.155***	2.096***
	(0.538)	(0.536)	(0.860)	(0.539)	(0.542)	(0.524)
Age	0.0215	0.0222	0.0204	0.0320	0.0230	0.0196
	(0.0259)	(0.0262)	(0.0256)	(0.0311)	(0.0268)	(0.0260)
Years of education	0.0841	0.0843	0.0863	0.0845	0.111	0.0856
	(0.0680)	(0.0688)	(0.0675)	(0.0676)	(0.124)	(0.0665)
Income >IDR 2 million/month	0.0871	0.112	0.0450	0.0577	0.117	1.272
	(0.886)	(0.891)	(0.866)	(0.871)	(0.868)	(1.529)
Region lived in 2003: Aceh Timur	-1.996**	-2.026**	-2.007**	-1.996**	-1.988**	-2.040**
	(0.970)	(0.993)	(0.976)	(0.969)	(0.962)	(0.964)
Region lived in 2003: Aceh Utara	-1.028	-1.027	-1.040	-1.005	-1.019	-0.986
	(0.926)	(0.946)	(0.934)	(0.928)	(0.920)	(0.919)
Javanese partner × conflict experience	0.478					
	(0.461)					
Female partner × conflict experience		-0.785*				
		(0.443)				
Negative belief × conflict experience			-0.416			
			(0.996)			
Age × conflict experience				-0.0191		
				(0.0411)		
Years of education × conflict experience					-0.0364	
					(0.129)	
Income × conflict experience						-1.589
						(1.638)
Constant	-4.697***	-5.255***	-4.920***	-5.247***	-5.252**	-4.850***
	(1.797)	(1.867)	(1.795)	(1.862)	(2.341)	(1.778)
$\ln(\hat{\sigma_v}^2)$	1.581***	1.635***	1.574***	1.573***	1.579***	1.565***
	(0.348)	(0.359)	(0.345)	(0.356)	(0.350)	(0.346)
Observations	680	680	680	680	680	680
Number of id	170	170	170	170	170	170

Notes: Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$.

Table A.12: Panel regression on the role of personal attitudes, Aceh (dependent variable: burning decision)

	(1)	(2)	(3)	(4)	(5)
Javanese partner	0.401	0.457*	0.733***	0.627**	0.505**
	(0.277)	(0.260)	(0.269)	(0.245)	(0.232)
Conflict experience (injured or killed)	-0.409	0.0356	0.100	-0.281	-0.901
	(0.761)	(0.706)	(0.652)	(0.654)	(0.647)
Female	-2.208	-1.117	-0.938	-1.991*	-1.261
	(1.661)	(1.049)	(0.968)	(1.141)	(0.933)
Female partner	0.243	0.184	0.151	0.00790	0.124
	(0.326)	(0.231)	(0.227)	(0.260)	(0.213)
Female × conflict experience	3.262	2.215*	2.267*	3.476**	3.065**
	(2.044)	(1.325)	(1.208)	(1.450)	(1.190)
Negative belief	1.696**	2.025***	1.768***	1.683***	2.278***
	(0.693)	(0.648)	(0.644)	(0.602)	(0.629)
Age	0.0392	0.0308	0.0233	0.00391	0.0124
	(0.0348)	(0.0256)	(0.0308)	(0.0273)	(0.0240)
Years of education	0.166*	0.0985	0.147**	0.0488	0.0865
	(0.0964)	(0.0788)	(0.0725)	(0.0711)	(0.0671)
Income >IDR 2 million/month	-1.572	0.0115	-0.110	0.147	0.432
	(1.471)	(0.927)	(0.926)	(0.853)	(0.853)
Region lived in 2003: Aceh Timur	-1.657	-2.095*	-2.351**	-0.922	-2.384**
	(1.684)	(1.116)	(1.065)	(1.168)	(0.975)
Region lived in 2003: Aceh Utara	-1.365	-1.585	-1.449	-0.830	-1.486
	(1.678)	(1.082)	(1.024)	(1.171)	(0.930)
Religiosity	-0.101				
	(0.0926)				
Religious fundamentalism		-0.0229			
		(0.0160)			
Machiavellianism			-0.0475		
			(0.0305)		
Aggression				-0.00890	
				(0.0197)	
SVO: individual					2.776**
					(1.332)
SVO: competitive					2.495***
					(0.845)
SVO: indeterminate					0.754
					(0.534)
Constant	-2.749	-3.593*	-2.877	-2.781	-3.891**
	(4.085)	(1.887)	(2.660)	(2.493)	(1.729)
$\ln(\hat{\sigma_v}^2)$	2.021***	1.423***	1.465***	1.290***	1.383***
	(0.501)	(0.410)	(0.431)	(0.429)	(0.351)
Observations	456	456	544	476	680
Number of id	114	114	136	119	170

Notes: Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$. SVO was relative to those with prosocial orientation.

Table A.13: Panel regression on the role of personal attitudes sub-traits/dimensions, Aceh (dependent variable: burning decision)

	(1)	(2)	(3)	(4)	(6)	(7)	(8)	(8)
Javanese partner	0.520*	0.465*	0.464*	0.523**	0.566**	0.763***	0.561**	0.480**
	(0.291)	(0.238)	(0.239)	(0.242)	(0.238)	(0.259)	(0.237)	(0.215)
Conflict experience (injured or killed)	-0.159	0.359	-0.173	-0.109	-0.300	-0.873	-0.453	-0.500
	(0.685)	(0.664)	(0.541)	(0.566)	(0.573)	(0.710)	(0.648)	(0.666)
Female	-2.099	-0.799	-2.349**	-1.425	-1.352	-2.299*	-1.557	-1.501
	(1.758)	(0.929)	(1.067)	(0.928)	(0.902)	(1.216)	(0.977)	(0.968)
Female partner	0.228	0.133	0.132	0.126	0.0841	0.00347	0.0817	0.137
	(0.305)	(0.229)	(0.230)	(0.222)	(0.218)	(0.242)	(0.218)	(0.240)
Female × conflict experience	3.131	2.331**	3.067**	2.480**	2.679**	4.291***	2.888**	2.925**
	(2.014)	(1.141)	(1.285)	(1.152)	(1.130)	(1.551)	(1.222)	(1.222)
Negative belief	1.451**	1.996***	1.662***	1.849***	1.671***	2.077***	2.065***	2.351***
	(0.685)	(0.539)	(0.520)	(0.530)	(0.539)	(0.638)	(0.585)	(0.593)
Age	0.0416	0.0193	0.0178	0.0162	0.0157	-0.00303	0.0161	0.00620
	(0.0330)	(0.0249)	(0.0262)	(0.0247)	(0.0239)	(0.0274)	(0.0249)	(0.0282)
Years of education	0.118	0.135**	0.135**	0.0958	0.0471	-0.0341	0.0498	0.0666
	(0.0886)	(0.0685)	(0.0654)	(0.0631)	(0.0632)	(0.0730)	(0.0688)	(0.0747)
Income >IDR 2 million/month	-1.924	-0.414	-0.187	-0.442	-0.0975	0.775	0.298	0.738
	(1.418)	(0.910)	(0.807)	(0.865)	(0.848)	(0.906)	(0.894)	(0.903)
Region lived in 2003: Aceh Timur	-2.156	-1.610	-1.891*	-2.023**	-1.565	-2.017*	-1.975*	-1.745
	(1.586)	(1.081)	(1.019)	(0.985)	(1.042)	(1.085)	(1.012)	(1.196)
Region lived in 2003: Aceh Utara	-1.419	-1.437	-1.509	-1.385	-0.960	-1.684	-1.387	-1.366
	(1.587)	(1.077)	(0.983)	(0.958)	(1.018)	(1.105)	(1.008)	(1.156)
Religiosity: ritual	0.587							
	(0.624)							
Religiosity: consequential		-0.420**						
		(0.167)						
Religiosity: ideological			-0.315					
			(0.204)					
Religiosity: experiential				0.165				
				(0.204)				
Aggression: hostility					-0.0295			
					(0.0370)			

	(1)	(2)	(3)	(4)	(6)	(7)	(8)	(8)
Aggression: physical						-0.111**		
						(0.0496)		
Aggression: verbal							-0.0114	
							(0.0629)	
Aggression: anger								-0.0517
								(0.0698)
Constant	-11.00	-1.379	-1.070	-5.430**	-2.919	1.073	-3.330*	-2.665
	(6.959)	(2.227)	(2.687)	(2.400)	(1.960)	(2.140)	(1.990)	(2.685)
$\ln(\hat{\sigma}_v{}^2)$	1.959***	1.344***	1.249***	1.449***	1.365***	1.408***	1.541***	1.457***
	(0.462)	(0.366)	(0.402)	(0.366)	(0.385)	(0.407)	(0.373)	(0.394)
Observations	504	624	584	640	592	532	628	600
Number of id	126	156	146	160	148	133	157	150

Notes: Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$.

Table A.14: Panel regression on the role of personal attitudes and gender, Aceh (dependent variable: burning decision)

	(1)	(2)	(3)	(4)
Javanese partner	0.456*	0.731***	0.480**	0.764***
	(0.258)	(0.268)	(0.215)	(0.260)
Conflict experience (injured or killed)	0.0548	0.00985	-0.556	-0.820
	(0.690)	(0.637)	(0.664)	(0.698)
Female	-3.072**	4.464	-0.534	2.258
	(1.323)	(3.670)	(2.494)	(2.137)
Female partner	0.184	0.153	0.137	0.00206
	(0.231)	(0.227)	(0.240)	(0.242)
Female × conflict experience	2.182*	2.677**	3.062***	4.393***
	(1.249)	(1.177)	(1.166)	(1.619)
Negative belief	1.691***	1.591**	2.323***	2.009***
	(0.633)	(0.634)	(0.592)	(0.628)
Age	0.0312	0.0333	0.00840	-0.00596
	(0.0254)	(0.0306)	(0.0272)	(0.0276)
Years of education	0.0714	0.126*	0.0613	-0.0509
	(0.0840)	(0.0713)	(0.0806)	(0.0782)
Income >IDR 2 million/month	0.170	-0.0207	0.700	0.794
	(0.928)	(0.902)	(0.893)	(0.889)
Region lived in 2003: Aceh Timur	-2.267**	-2.257**	-1.610	-1.696
	(1.057)	(1.022)	(1.140)	(1.076)
Region lived in 2003: Aceh Utara	-1.860*	-1.646	-1.305	-1.337
	(1.026)	(1.025)	(1.143)	(1.081)
Religious fundamentalism	-0.0456**			
	(0.0186)			
Female × religious fundamentalism	0.0690*			
	(0.0367)			
Mach-IV		0.00449		
		(0.0433)		
Female × Mach-IV		-0.126		
		(0.0772)		
Aggression: anger			-0.0255	
			(0.0748)	
Female × anger			-0.0670	
			(0.151)	
Aggression: physical				-0.0584
				(0.0598)
Female × physical aggression				-0.219**
				(0.0995)
Constant	-2.365	-5.185*	-3.155	-0.0825
	(1.979)	(3.092)	(2.402)	(2.259)
$\ln(\hat{\sigma}_v^2)$	1.308***	1.395***	1.453***	1.367***
	(0.434)	(0.418)	(0.397)	(0.401)
Observations	456	544	600	532
Number of id	114	136	150	133

Notes: Robust standard errors in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$.
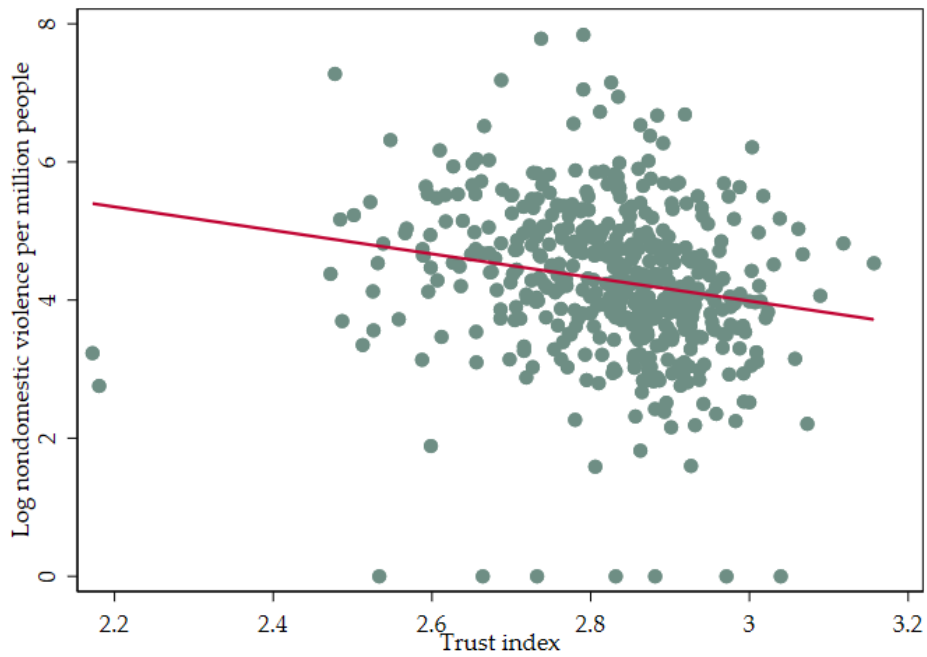
Appendix B

Figures

Figure B.1: Trust and violence in 2014

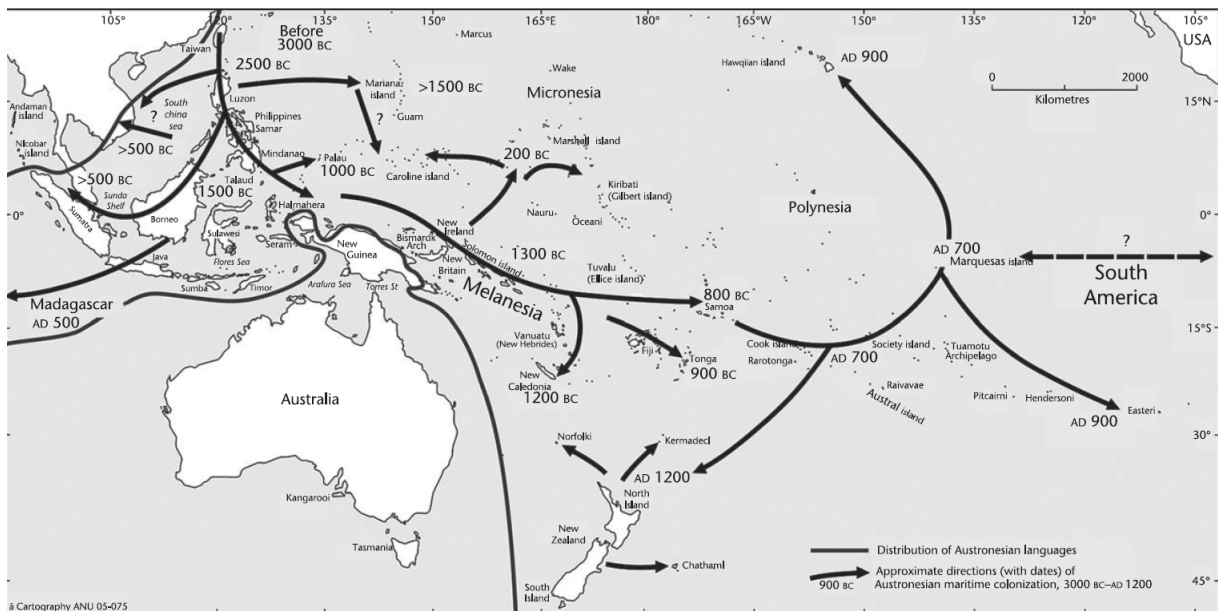Source: Calculated from 2014 survey on social resilience and NVMS 2014.

Figure B.2: The dispersal of Austronesian-speaking people
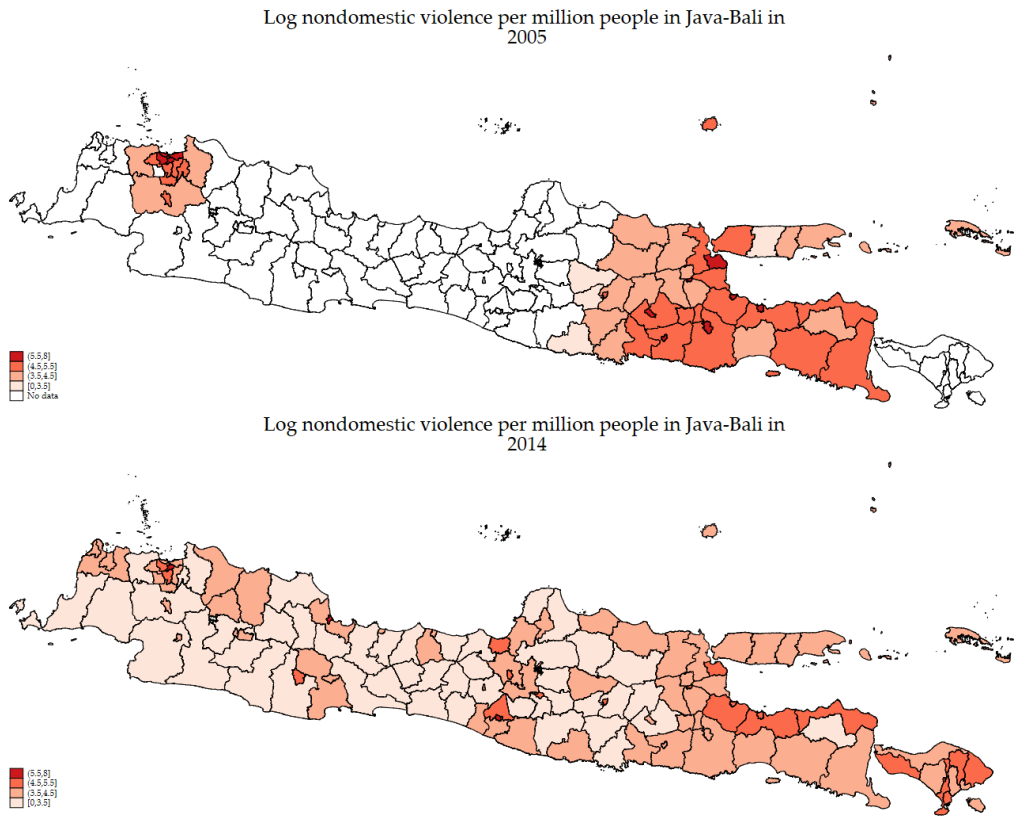
Source: Chambers (2013).

Log nondomestic violence per million people in Java-Bali in
2005

Log nondomestic violence per million people in Java-Bali in
2014

Figure B.3: Distribution of violence in Java-Bali, 2005 and 2014

Source: Calculated from NVMS and population census.

Log nondomestic violence per million people in Nusa Tenggara in
2005

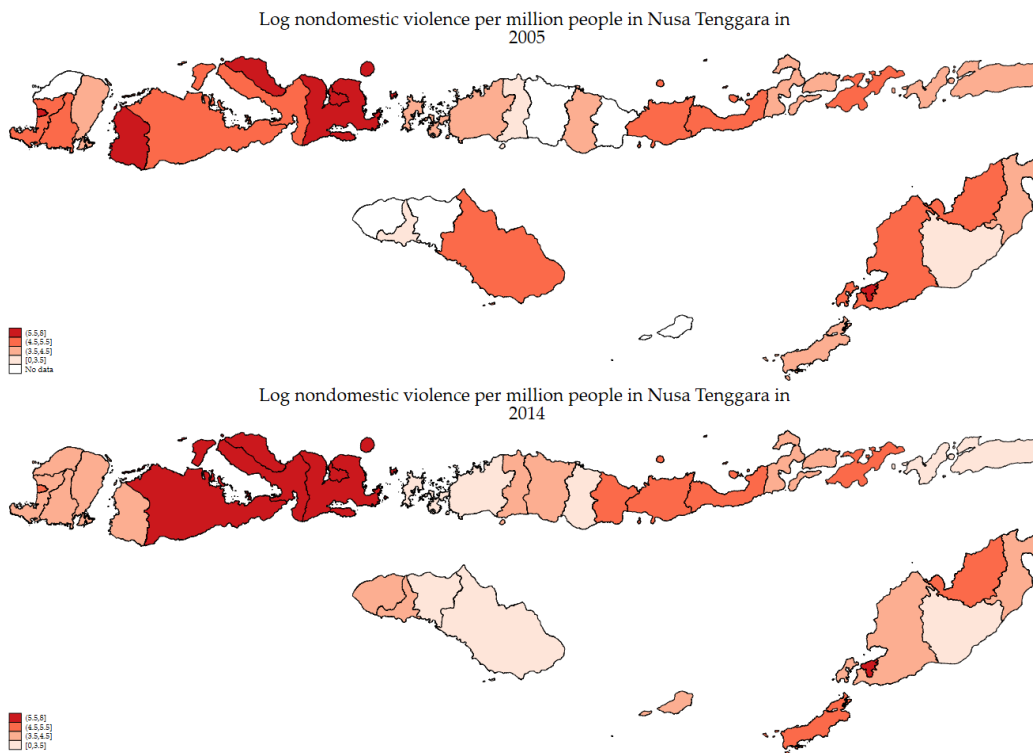Log nondomestic violence per million people in Nusa Tenggara in
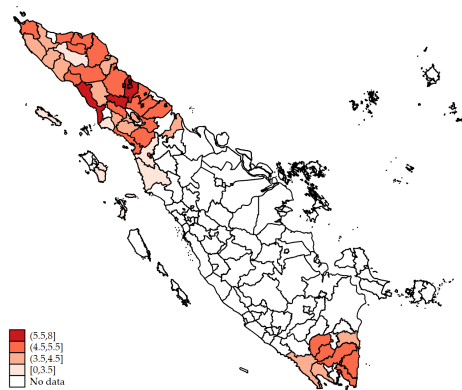2014

Figure B.4: Distribution of violence in Nusa Tenggara, 2005 and 2014

Source: Calculated from NVMS and population census.

Log nondomestic violence per million people
in Sumatera in
2005

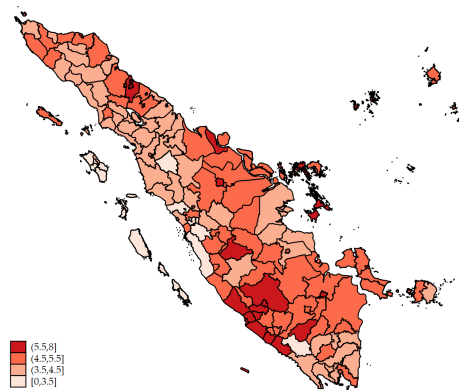Log nondomestic violence per million people
in Sumatera in
2014

(5.5,8]
(4.5,5.5]
(3.5,4.5]
[0,3.5]
No data

(5.5,8]
(4.5,5.5]
(3.5,4.5]
[0,3.5]

Figure B.5: Distribution of violence in Sumatera, 2005 and 2014

Source: Calculated from NVMS and population census.

Log nondomestic violence per million people
in Kalimantan in
2005

Log nondomestic violence per million people
in Kalimantan in
2014

(5.5,8]
(4.5,5.5]
(3.5,4.5]
[0,3.5]
No data

(5.5,8]
(4.5,5.5]
(3.5,4.5]
[0,3.5]

Figure B.6: Distribution of violence in Kalimantan, 2005 and 2014

Source: Calculated from NVMS and population census.

Log nondomestic violence per million people
in Sulawesi in
2005

Log nondomestic violence per million people
in Sulawesi in
2014

(5.5,8]
(4.5,5.5]
(3.5,4.5]
[0,3.5]
No data
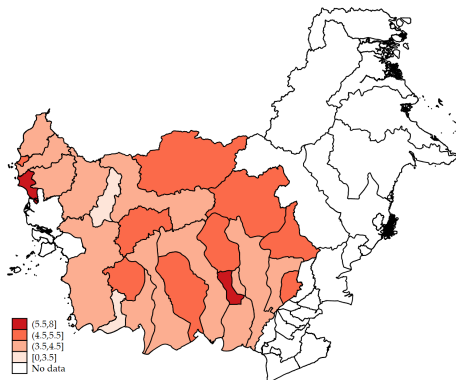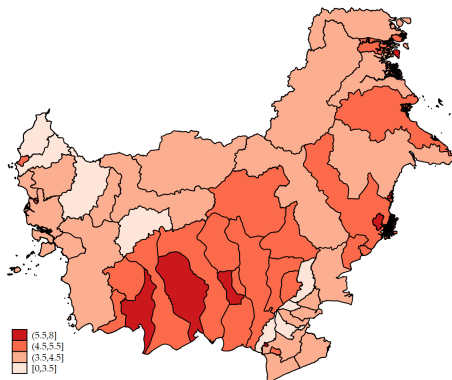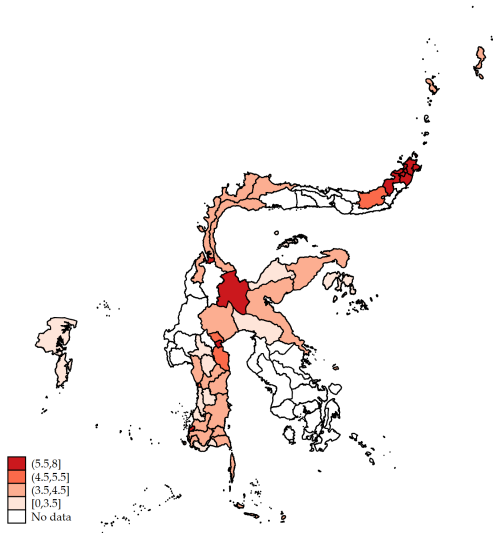
(5.5,8]
(4.5,5.5]
(3.5,4.5]
[0,3.5]

Figure B.7: Distribution of violence in Sulawesi, 2005 and 2014

Source: Calculated from NVMS and population census.

Log nondomestic violence per million people
in Maluku in
2005

Log nondomestic violence per million people
in Maluku in
2014

(5.5,8]
(4.5,5.5]
(3.5,4.5]
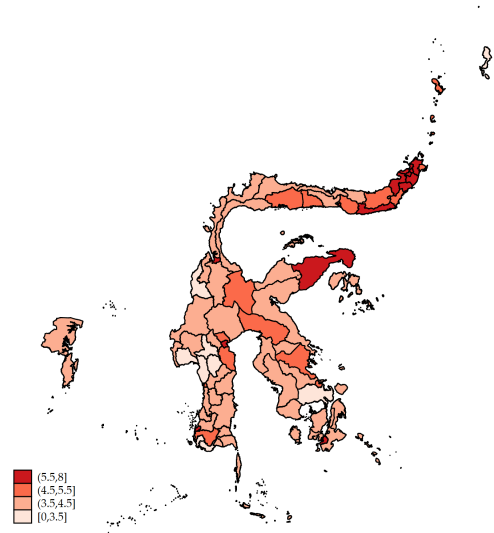[0,3.5]
No data

(5.5,8]
(4.5,5.5]
(3.5,4.5]
[0,3.5]
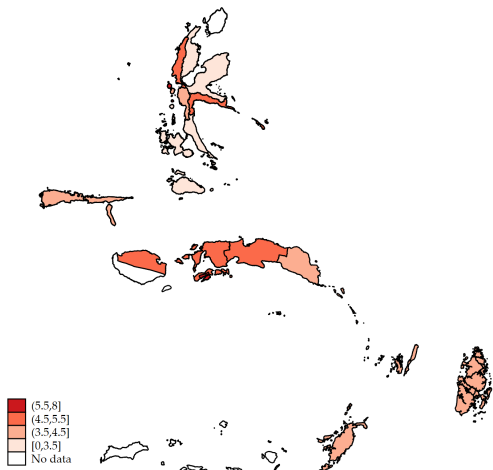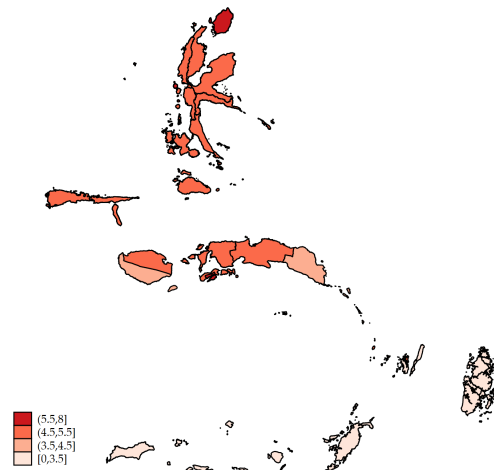
Figure B.8: Distribution of violence in Maluku, 2005 and 2014

Source: Calculated from NVMS and population census.

Log nondomestic violence per million people
in Papua in
2005

Log nondomestic violence per million people
in Papua in
2014

(5,5,8]
(4.5,5.5]
(3.5,4.5]
[0,3.5]
No data

(5,5,8]
(4.5,5.5]
(3.5,4.5]
[0,3.5]
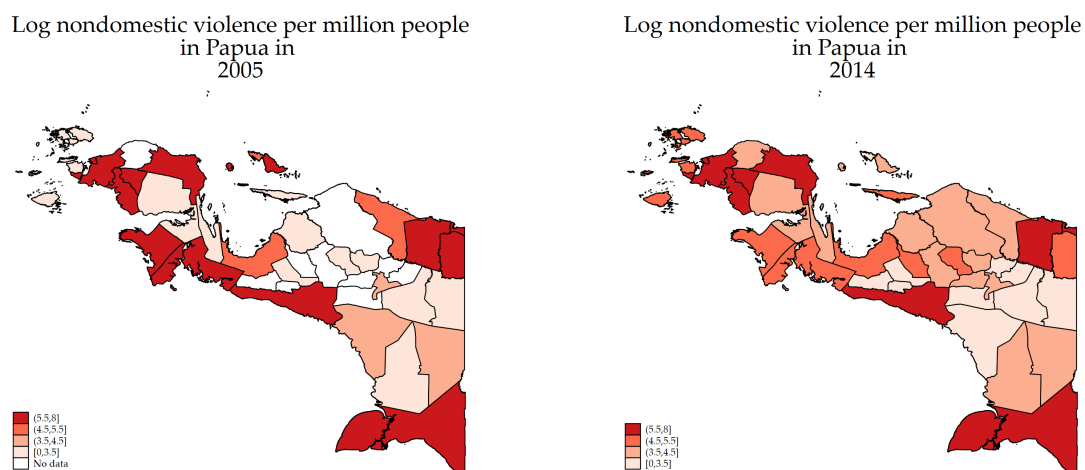
Figure B.9: Distribution of violence in Papua, 2005 and 2014

Source: Calculated from NVMS and population census.
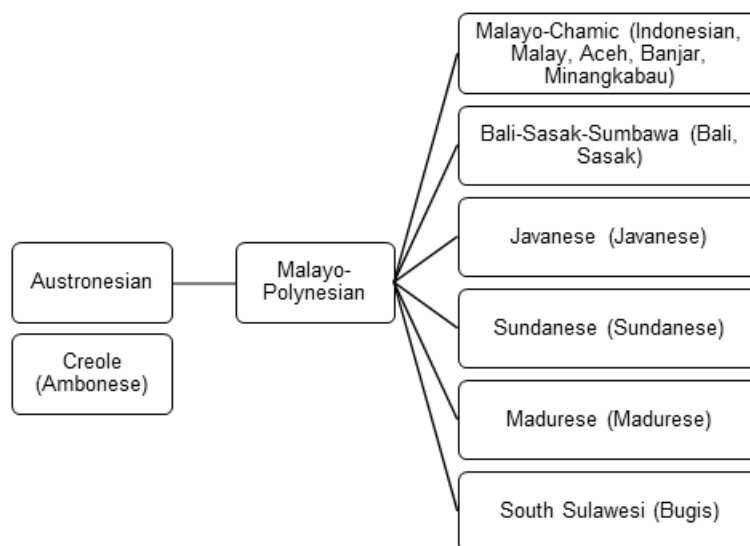
Figure B.10: Language tree of major languages

Notes: The branching stopped at the last common branch of the languages. Language names in
parentheses.
Source: Ethnologue.

Figure B.11: Typical experimental sessions in Aceh

Figure B.12: Documentations from Aceh (payments)

Figure B.13: Poster placement

Appendix C

Experimental Instructions

Melbourne Experiment

Form A

Date: _____

Participant number: _____

1. Age at last birthday: _____ year

2. Sex: 1. Male / 2. Female

3. Religion: 1. Islam / 2. Christian / 3. Catholics /

    4. Other: _____

4. Ethnic identity: 1. Acehnese / 2. Javanese / 3. Gayo / 4. Alas /

    5. Lainnya: _____

5. Salutation you most identify with: 1. Bang / 2. Kak / 3. Mas / 4. Mbak

6. Employment status: 1. Working / 2. Not working

7. Approximately how much do you earn per month (in $)
    □ 1. Less than 1000
    □ 2. 1000-1999
    □ 3. 2000-2999
    □ 4. 3000-4000
    □ 5. More than 4000

8. Marital status:
    □ 1. Not married   □ 2. Married
   □ 3. Separated   □ 4. Divorced
    □ 5. Widow/er   □ 6. Cohabitating

9. Highest completed education:
    □ 1. No/not yet in school
    □ 2. Elementary school or equivalent
    □ 3. Junior high school or equivalent
    □ 4. Senior high school or equivalent
    □ 5. Pesantren/meunasah/madrasah
    □ 6. University
    □ 7. Others

10. Length of stay in Australia: _____ year, _____ month

11. Reason for staying in Australia:
    □ 1. Education   □ 2. Work
    □ 3. Follow family   □ 4. Other

Form B

Date: _____

Participant number: _____

Please now decide if you want to reduce your co-participant's money by $10, in which case you have to pay $1, OR leave the money as it is, in which case you do not have to pay.

My decision is (tick one):

- ☐ 1. to leave their money as it is and not have to pay.
- ☐ 2. to reduce their money by $10 and pay $1.

Form C

Date: _____

Participant number: _____

Decision implemented: _____ (filled in by investigator)

Please now consider the five different statements below. In each case, please decide if you want to reduce your co-participant's money by $10, in which case you have to pay $1, OR leave the money as it is, in which case you do not have to pay.

1. If my co-participant most identifies with the salutation of "mas", my decision is: (tick one)

   □ 1. to leave their money as it is and not have to pay.
   □ 2. to reduce their money by $10 and pay $1.

2. If my co-participant most identifies with the salutation of "mbak", my decision is: (tick one)

   □ 1. to leave their money as it is and not have to pay.
   □ 2. to reduce their money by $10 and pay $1.

3. If my co-participant most identifies with the salutation of "bang", my decision is: (tick one)

   □ 1. to leave their money as it is and not have to pay.
   □ 2. to reduce their money by $10 and pay $1.

4. If my co-participant most identifies with the salutation of "kak", my decision is: (tick one)

   □ 1. to leave their money as it is and not have to pay.
   □ 2. to reduce their money by $10 and pay $1.

5. If my co-participant is the computer, my decision is: (tick one)

   □ 1. to leave their money as it is and not have to pay.
   □ 2. to reduce their money by $10 and pay $1.

Aceh Experiment

Instruction Sheet: General
(Read after all participants sign CF)

1. INTRODUCTION	You are taking part in this research project being conducted by investigators from RMIT University and Gadjah Mada University. The purpose of this project is to understand the effect of past economic and political changes on the lives of ordinary people in Aceh. You have been selected to participate because you are above 25 years of age and you lived in Aceh between 2000-2005. We would like to know some things about you, your views on a number of issues and how you make decisions in a series of decision tasks.
2. RULES	Before we begin there are several rules we would like you to keep in mind: • First, you should not talk with one another or look at anyone else's documents; • Second, please listen to and follow all instructions that we give you. This is very important; and • Third, there are several forms in front of you, labelled and ordered A to D. Please do not open them or fill them in until we tell you to do so.
3. PARTICIPANT NUMBER	Also in front of you is a participant slip with your unique **participant number**. It is very important that you do not show or reveal this number to anyone else, except to the investigators. This slip will be destroyed at the end of today's session to preserve your anonymity.
4. EXPLAINING FORM A-D	You will be asked to provide your demographics, views and decisions in forms A to D. In providing this information, you will only be identified by your participant number which you must write clearly on all the forms. We will compensate you with a flat payment of IDR 25,000 upon the completion of the survey questionnaire (form D) and up to IDR 75,000 depending on your decisions and those of your co-participant in the decision tasks. You should understand that these payments are not from our own money. They are from money granted to us by various donor organisations to conduct this research. We will begin by collecting some demographic information about you (in form A), followed by the decision tasks (in forms B and C), and ending with the survey questionnaire (form D). After completing the survey

	questionnaire, we will ask you to come to the adjacent room for your private payment. Please bring your participant slip with you. This adjacent room is private and no one but the investigator will be there to pay you. No one will see or know your decisions or how much you are paid. After payment, you will be given a debriefing document explaining the tasks and you are then ready to go. In total, we expect this session to last 2 hours. If you feel uncomfortable about the tasks ahead, or if you already know that you will not be able to stay for 2 hours, then you should not try to participate. Please let us know now if this is the case. Do you have any questions? If so, please raise your hand.
5. START FORM A	Otherwise, please now open **Form A** and fill in your demographic information. Make sure you write your participant number before you start. When you have finished, please raise your hand and the investigator will collect the form from you.

2

Instruction Sheet: Decision Tasks
(Read after all participants finished with Form A)

1. SIMULTANEOUS SESSION	Below are the instructions of the decision tasks. Let us read them together carefully. At any time, if you do not understand, please raise your hand.
	At this very moment, another session with exactly the same instructions and decision tasks is taking place in another village in Aceh. This village is in another district of Aceh, at least 50 kilometers away from you. The participants in this other village have been invited to take part the same way as you and have to fill in the same forms as you. They are now with another team of our investigators, following the same order of stages in the session as you.
2. CO-PARTICIPANT	Each of you in this village will be randomly matched with a participant from the other village. This participant is your co-participant. You will never be told the name of the other village nor the identity of your co-participant. Likewise, your co-participant will never be told the name of your village nor your identity. You and your village will always remain anonymous, and vice versa.
3. ENDOWMENT	In this task, you have been given IDR 75,000. This is your money. But at the moment we will keep this money on your behalf. Your co-participant in the other village has also been given IDR 75,000. Similarly, it is being kept on their behalf by the investigators in their village.
4. PAYOFF REDUCTION	You will have the opportunity to **reduce** your co-participant's money or to **leave it** as it is. Your co-participant also has the same opportunity to reduce your money or leave it as it is. It is important to note that even though both participants in the pair make the decision whether to reduce or leave the other's money, only the decision made by **one** participant **in each pair** will be implemented. For each pair, we will decide whose decision is implemented by tossing a coin, after both participants have made their decisions. If heads comes up, your decision will be implemented. If tails comes up, your co-participant's decision will be implemented. The coin toss will be conducted in this village after Form C has been completed and the outcome will be conveyed to the other village via a phone call for implementation.

| **5. COST OF PAYOFF REDUCTION** | Now, if you decide to reduce your co-participant's money, you will have to pay IDR 3,000. This comes out of your initial IDR 75,000. By paying IDR 3,000, you will reduce your co-participant's money by IDR 30,000. This comes out of their initial IDR 75,000. If your decision is NOT the one chosen for implementation, you will not have to pay as your decision will not be implemented. Your co-participant will face the same decision, whether to reduce or leave your money as it is. They will also have to pay IDR 3,000 to reduce your money by IDR 30,000. Neither party has to pay if they decide to leave the money as it is. You will receive in cash at the end of the session whatever part of your initial IDR 75,000 that has not been spent or deducted. |

| **6. SUMMARY** | Here is a summary of how your payment will be calculated (number after semicolon is your co-participant's money): |

Decision		**Your payment (in IDR '000) if:**	
You	*Your co-participant*	*Your decision is implemented*	*Your decision is not implemented*
Leave	Leave	75; 75	75; 75
Leave	Reduce	75; 75	45; 72
Reduce	Leave	72; 45	75; 75
Reduce	Reduce	72; 45	45; 72

| **7. EXAMPLE** | Here are some examples to help you understand the above:

Example 1:
- If both you and your co-participant decide to pay IDR 3,000 to reduce each other's money and your decision was chosen by coin toss to be implemented, you will earn IDR 72,000 (=IDR 75,000-IDR 3,000) and your co-participant will earn IDR 45,000 (= IDR 75,000 – IDR 30,000);
- As your decision was chosen by the coin toss to be implemented, the decision made by your co-participant will **not** be implemented; |

4

- However, if your decision was **not** chosen by coin toss to be implemented (and your co-participant's was), then you will earn IDR 45,000 while your co-participant earns IDR 72,000.

Example 2:

- Let's say that you decide to reduce your co-participant's money **if they satisfy a certain criterion** (for e.g., their gender is male) and that your decision was chosen by coin toss to be implemented;
- In this case, if the co-participant **does not** satisfy the criterion (i.e. they are female), then both will retain IDR 75,000.
- If the co-participant **does** satisfy the criterion (i.e. they are male), then you will earn IDR 72,000 (=IDR 75,000-IDR 3,000) and your co-participant will earn IDR 45,000 (=IDR 75,000-IDR 30,000).

Do you have any questions? If so, please raise your hand.

| **8. PRACTICE** | Now, let us perform a trial run, just to check your understanding of these instructions. This is just a trial, so your answers will not affect your final payment. |

Trial run

Please tick one box to indicate your decision for each statement below

If my co-participant is a male, my decision is

☐ to leave their money as it is and not have to pay
☐ to reduce their money by IDR 30,000 and pay IDR 3,000

If my co-participant is a female, my decision is

☐ to leave their money as it is and not have to pay
☐ to reduce their money by IDR 30,000 and pay IDR 3,000

| 9. COMPREHENSION QUIZ | Now, the investigator will flip a coin. Since this is just a trial run, it will be done only once and the outcome will apply to everyone. Recall that if heads comes up, your decision will be the one chosen for implementation.

Now, that you know the outcome of the coin toss, please answer the questions in the comprehension quiz below. Again, this is just to check that you have understood the instructions.

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Comprehension quiz

Q1: My co-participant is in this village. True/false?

Q2: My co-participant knows where I live. True/false?

Q3: Regardless of the outcome of the coin toss, my decisions will always be implemented. True/false?

Now consider the outcome of the coin toss:

Q4: If my co-participant is willing to pay IDR 3,000 to reduce my money, my earning would be IDR _____ .

Q5: My co-participant will earn IDR_____ if she is a female.

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It is important that you are able to answer all these questions before you start the decision tasks.

If you have problems answering these questions, please raise your hand. |

10. START FORM B	Before we start the decision tasks, please remember that you will receive your payment after all the decision tasks and survey questionnaire are completed. It is very important to keep in mind your decisions are absolutely private and will not be disclosed to anyone besides the investigators. However, if you feel uncomfortable making the decisions described above, you are free to withdraw from this session. Please let the investigators know if you want to do so. Now, please open **Form B**. Please **tick one box** to indicate your decision. Make sure you write your participant number before you start. When you have finished, please raise your hand. The investigator will collect Form B from you and give you **Form C.**
11. START FORM C	Again, in Form C, please **tick one box** to indicate your decision **for each statement.** Make sure you write your participant number before you start.
12. COIN TOSS	When you have finished, please raise your hand. The investigator will come to you to toss the coin and note the outcome of the coin toss on Form C. This tells you whether your decisions will be implemented. The investigator will then collect Form C from you. Once Form C has been collected, the decisions tasks are complete.
13. START FORM D	While we are preparing your payment, we would like you to fill in the survey questionnaire in Form D. Please now open **Form D** and answer all the questions in the form. Make sure you write your participant number before you start. If you have problems answering these questions, please raise your hand. When you have finished filling in the survey questionnaire (Form D), please raise your hand and the investigator will come and collect the form from you.

7

| 14. FINISH (PAYMENT) | Now, you are ready for payment. We will pay the participants one by one, in the privacy of the next room. You will also be debriefed after payment. Please wait in your seat until the investigators tell you it is your turn to go to the next room for payment. Please do not leave your seat until instructed by the investigators.

When you leave, please bring your participant slip, the participant information sheet and your own belongings. Please leave everything else behind.

We hope you enjoyed this session and we thank you very much for taking part. |

Form A

Date: _____

Participant number: _____

1. Age at last birthday: _____ year

2. Sex: 1. Male / 2. Female

3. Religion: 1. Islam / 2. Christian / 3. Catholics /

   4. Other: _____

4. Ethnic identity: 1. Acehnese / 2. Javanese / 3. Gayo / 4. Alas /

   5. Other: _____

5. Salutation you most identify with: 1. Bang / 2. Kak / 3. Mas / 4. Mbak

6. Employment status: 1. Working / 2. Not working

7. Approximately how much do you earn per month (in IDR):

   □ 1. <1 million

   □ 2. 1-2 million

   □ 3. 2-3 million

   □ 4. 3-4 million

   □ 5. >4 million

8. Marital status:
   □ 1. Not married   □ 2. Married

   □ 3. Separated   □ 4. Divorced

   □ 5. Widow/er   □ 6. Cohabiting

9. Highest completed education:
   □ 1. No/not yet in school

   □ 2. Elementary school or equivalent

   □ 3. Junior high school or equivalent

   □ 4. Senior high school or equivalent

   □ 5. Pesantren/meunasah/madrasah

   □ 6. University

   □ 7. Others

Form B

Date: _____

Participant number: _____

Please now decide if you want to reduce your co-participant's money by IDR 30,000, in which case you have to pay IDR 3,000, OR leave the money as it is, in which case you do not have to pay.

My decision is (tick one):

□   1. to leave their money as it is and not have to pay.
□   2. to reduce their money by IDR 30,000 and pay IDR 3,000.

Form C

Date: _____

Participant number: _____

Decision implemented: _____ (filled in by investigator)

Please now consider the four different statements below. In each case, please decide if you want to reduce your co-participant's money by IDR 30,000, in which case you have to pay IDR 3,000, OR leave the money as it is, in which case you do not have to pay.

1. If my co-participant most identifies with the salutation of "mas", my decision is: (tick one)

☐ 1. to leave their money as it is and not have to pay.
☐ 2. to reduce their money by IDR 30,000 and pay IDR 3,000.

2. If my co-participant most identifies with the salutation of "mbak", my decision is: (tick one)

☐ 1. to leave their money as it is and not have to pay.
☐ 2. to reduce their money by IDR 30,000 and pay IDR 3,000.

3. If my co-participant most identifies with the salutation of "bang", my decision is: (tick one)

☐ 1. to leave their money as it is and not have to pay.
☐ 2. to reduce their money by IDR 30,000 and pay IDR 3,000.

4. If my co-participant most identifies with the salutation of "kak", my decision is: (tick one)

☐ 1. to leave their money as it is and not have to pay.
☐ 2. to reduce their money by IDR 30,000 and pay IDR 3,000.

Appendix D

Questionnaires

Form D

Survey questionnaire

Date: _____

Participant number: _____

Part 1

Please answer these questions.

Do you think that your co-participant is willing to pay IDR 3,000 to reduce your IDR 75,000? (Tick one.)

☐ 1. Yes
☐ 2. No

Part 2

These questions are related with your experience during the Aceh conflict (during and before the 2005 peace treaty). **If you never lived in Aceh in 2000-2005 then you do not need to answer these questions and please go to Part 3.**

Where do you live in:

Year	Province	District/municipality
2000		
2001		
2002		
2003		
2004		
2005		

Tick Yes/No in each question. For each question where you answer "Yes", please circle one of the number 1-5 that suits you.

1. Were you or any member of your household injured as a result of the conflict?   □ 1. Yes   □ 2. No
   --- If Yes, to what extent does the incident affect you?
   No affect   1   2   3   4   5   Major affect

2. Was any member of household killed as a result of this conflict?   □ 1. Yes   □ 2. No
   --- If Yes, to what extent does the incident affect you?
   No affect   1   2   3   4   5   Major affect

3. Did your household have to move/flee within Aceh as a result of the conflict?   □ 1. Yes   □ 2. No
   --- If Yes, to what extent does the incident affect you?
   No affect   1   2   3   4   5   Major affect

4. Did your household have to move/flee outside Aceh as a result of the conflict?   □ 1. Yes   □ 2. No
   --- If Yes, to what extent does the incident affect you?
   No affect   1   2   3   4   5   Major affect

5. Did your household suffer property loss or destruction (including house/apartment) as a result of the conflict?   □ 1. Yes   □ 2. No
   --- If Yes, to what extent does the incident affect you?
   No affect   1   2   3   4   5   Major affect

6. Have you personally witnessed any armed clashes or fights in your village since the Peace Agreement in 2005?   □ 1. Yes   □ 2. No
   --- If Yes, to what extent does the incident affect you?
   No affect   1   2   3   4   5   Major affect

7. Did you personally fight in the civil conflict in Aceh from before the Peace   □ 1. Yes   □ 2. No
   Agreement in 2005?
   --- If Yes, to what extent does the incident affect you?
         No affect   1   2   3   4   5   Major affect

8. Did you personally take part in armed clashes or fight in Aceh after the Peace   □ 1. Yes   □ 2. No
   Agreement in 2005?
   --- If Yes, to what extent does the incident affect you?
         No affect   1   2   3   4   5   Major affect

Part 3

Please tick one box for each statement

Strongly disagree   1   2   3   4   5   **Strongly agree**

		1	2	3	4	5
1.	Never tell anyone the real reason you did something unless it is useful to do so.					
2.	The best way to handle people is to tell them what they want to hear.					
3.	One should take action only when sure it is morally right.					
4.	Most people are basically good and kind.					
5.	It is safest to assume that all people have a vicious streak and it will come out when they are given a chance.					
6.	Honesty is the best policy in all cases.					
7.	There is no excuse for lying to someone else.					
8.	Generally speaking, people won't work hard unless they're forced to do so.					
9.	All in all, it is better to be humble and honest than to be important and dishonest.					
10.	When you ask someone to do something for you, it is best to give the real reasons for wanting it rather than giving reasons which carry more weight.					
11.	Most people who get ahead in the world lead clean, moral lives.					
12.	Anyone who completely trusts anyone else is asking for trouble.					
13.	The biggest difference between most criminals and other people is that the criminals are stupid enough to get caught.					
14.	Most people are brave.					
15.	It is wise to flatter important people.					

		1	2	3	4	5
16.	It is possible to be good in all respects.					
17.	It is not true to say that a sucker is born every minute.					
18.	It is hard to get ahead without cutting corners here and there.					
19.	People suffering from incurable diseases should have the choice of being put painlessly to death.					
20.	Most people forget more easily the death of their parents than the loss of their property.					

Part 4

Please tick one box for each statement

Strongly disagree   1   2   3   4   5   **Strongly agree**

	1	2	3	4	5
1. I am an even-tempered person.					
2. I have threatened people I know.					
3. Given enough provocation, I may hit another person.					
4. When frustrated, I let my irritation show.					
5. Other people always seem to get the breaks.					
6. I flare up quickly but get over it quickly.					
7. Some of my friends think I am a hothead.					
8. There are people who pushed me so far that we came to blows.					
9. When people are especially nice to me, I wonder what they want.					
10. I know that "friends" talk about me behind my back.					
11. At times I feel I have gotten a raw deal out of life.					
12. I am sometimes eaten up with jealousy.					
13. I am suspicious of overly friendly strangers.					
14. I sometimes feel like a powder keg ready to explode.					

15. I tell my friends openly when I disagree with them.				
16. I wonder why sometimes I feel so bitter about things.				
17. Once in a while, I can't control the urge to strike another person.				
18. I sometimes feel that people are laughing at me behind my back.				
19. I can think of no good reason for ever hitting a person.				
20. I have become so mad that I have broken things.				
21. If I have to resort to violence to protect my rights, I will.				
22. I have trouble controlling my temper.				
23. When people annoy me, I may tell them what I think of them.				
24. I can't help getting into arguments when people disagree with me.				
25. I often find myself disagreeing with people.				
26. I get into fights a little more than the average person.				
27. Sometimes I fly off the handle for no good reason.				
28. If somebody hits me, I hit back.				
29. My friends say that I'm somewhat argumentative.				

Part 5

Imagine that you have been randomly paired with another person, whom we will refer to simply as the "Other." This other person is someone you do not know and that you will not knowingly meet in the future. Both you and the "Other" person will be making choices by circling either the letter A, B, or C. Your own choices will produce points for both yourself and the "Other" person. Likewise, the other's choice will produce points for him/her and for you. Every point has value: the more points you receive, the better for you, and the more points the "Other" receives, the better for him/her.

For each of the nine choice situations, circle A, B, or C, depending on which column you prefer most:

(1)		A	B	C
	You get	480	540	480
	Other gets	80	280	480

(2)		A	B	C
	You get	560	500	500
	Other gets	300	500	100

(3)		A	B	C
	You get	520	520	580
	Other gets	520	120	320

(4)		A	B	C
	You get	500	560	490
	Other gets	100	300	490

(5)		A	B	C
	You get	560	500	490
	Other gets	300	500	90

(6)		A	B	C
	You get	500	500	570
	Other gets	500	100	300

(7)		A	B	C
	You get	510	560	510
	Other gets	510	300	110

(8)		A	B	C
	You get	550	500	500
	Other gets	300	100	500

(9)		A	B	C
	You get	480	490	540
	Other gets	100	490	300

Part 6

Please answer these questions

1. How many times have you attended religious services during the past week? _____ times.

2. When you have a serious personal problem, how often do you take religious advice or teaching into consideration?
   - ☐ 1. Almost always
   - ☐ 2. Usually
   - ☐ 3. Sometimes
   - ☐ 4. Never

3. Do you agree with the following statement? "Religion gives me a great amount of comfort and security in life."
   - ☐ 1. Strongly disagree
   - ☐ 2. Disagree
   - ☐ 3. Uncertain
   - ☐ 4. Agree
   - ☐ 5. Strongly agree

4. How much influence would you say that religion has on the way that you choose to act and the way that you choose to spend your time each day?
   - ☐ 1. No influence
   - ☐ 2. A small influence
   - ☐ 3. Some influence
   - ☐ 4. A fair amount of influence
   - ☐ 5. A large influence

5. Which of the following statements comes closest to your belief about God?
   - ☐ 1. I am sure that God really exists and that He is active in my life
   - ☐ 2. Although I sometimes question His existence, I do believe in God and believe He knows of me as a person
   - ☐ 3. I don't know if there is a personal God, but I do believe in a higher power of some kind
   - ☐ 4. I don't know if there is a personal God or a higher power of some kind, and I don't know if I ever will
   - ☐ 5. I don't believe in a personal God or in a higher power

6. During the past year, how often have you experienced a feeling of religious reverence or devotion?

   ☐ 1. Almost daily
   ☐ 2. Frequently
   ☐ 3. Sometimes
   ☐ 4. Rarely
   ☐ 5. Never

7. Which of the following best describes your practice of prayer or religious meditation?

   ☐ 1. Prayer is a regular part of my daily life
   ☐ 2. I usually pray in times of stress or need but rarely at any other time
   ☐ 3. I pray only during formal ceremonies
   ☐ 4. I never pray

8. Which one of the following statements comes closest to your belief about life after death (immortality)?

   ☐ 1. I believe in a personal life after death, a soul existing as a specific individual spirit
   ☐ 2. I believe in a soul existing after death as a part of a universal spirit
   ☐ 3. I believe in a life after death of some kind, but I really don't know what it would be like
   ☐ 4. I don't know whether there is any kind of life after death, and I don't know if I will ever know
   ☐ 5. I don't believe in any kind of life after death

Part 7

Please tick one box for each question.

	Strongly disagree	1	2	3	4	5	6	7	8	9	Strongly agree
1.	God has given humanity a complete, unfailing guide to happiness and salvation, which must be totally followed.										
2.	No single book of religious teachings contains all the intrinsic, fundamental truths about life.										
3.	The basic cause of evil in this world is Satan, who is still constantly and ferociously fighting against God.										
4.	It is more important to be a good person than to believe in God and the right religion.										
5.	There is a particular set of religious teachings in this world that are so true, you can't go any "deeper" because they are the basic, bedrock message that God has given humanity.										
6.	When you get right down to it, there are basically only two kinds of people in the world: the Righteous, who will be rewarded by God; and the rest, who will not.										
7.	Scriptures may contain general truths, but they should NOT be considered completely, literally true from beginning to end.										
8.	To lead the best, most meaningful life, one must belong to the one, fundamentally true religion.										

	1	2	3	4	5	6	7	8	9
9. "Satan" is just the name people give to their own bad impulses. There really is no such thing as a diabolical "Prince of Darkness" who tempts us.									
10. Whenever science and sacred scripture conflict, science is probably right.									
11. The fundamentals of God's religion should never be tampered with, or compromised with others' beliefs.									
12. All of the religions in the world have flaws and wrong teachings. There is no perfectly true, right religion.									

Part 8

Please tell us why you made the decision you did (feel free to write in any other comments you might like to make about the experiment)