Economic Determinants of Communal Conflict: Evidence from Indonesia

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Religion, ethnicity, and politics are typical explanatory variables of violent conflicts. From an economic point of view, economic growth reduces the risk of civil war, yet the economic determinants of conflict have been little studied. In this article, we empirically study the impact of regional macroeconomic conditions on the number of violent conflicts in Indonesia, a country with potential risks of communal conflict because of the plurality of its society. We use panel data consisting of observations on 16 Indonesian regions from 2004 to 2013 to assess the impact of economic factors on conflict, reevaluating the religion effect using dynamic models (SYS GMM estimator). Our findings suggest that only the inflation rate predicts the conflict growth rate. Economic growth, economic development, poverty, and even religion, do not significantly affect the number of regional conflicts.

Keywords: Communal conflict, religion, economic growth, inflation, poverty, economic development, Indonesia

Indonesia consists of thousands of islands, and has a culturally, ethnically, and religiously pluralistic society. Consequently, there are high potential risks of conflict based on these differences because communal conflicts usually have their root in tribal fanaticism, ethnicity, racism, regionalism, religion, nationalism, separatism, politics, interest groups, and a lack of rule of law (Blattman & Miguel, 2010; Esteban, Mayoral, & Ray, 2012; Esteban & Ray, 2008; Fearon & Laitin, 2003; Field, Levinson, Pande, & Visaria, 2008; Montalvo & Reynal-Querol, 2005). The role of these factors in Indonesian conflicts has been well studied (Arifianto, 2009; Barron, Kaiser, & Pradhan, 2004; Bertrand, 2004;

Departemen Pertahanan Republik Indonesia, 2008; Sidel, 2006; Sukma, 2005; van Klinken, 2007; Wilson, 2011).

Although scholars usually recognize an economic component to conflict (looking beyond the Marx's class theory) and double causality, the impact of economic factors on communal conflicts has been little studied both in the theoretical and empirical literature (Fernández-de-Pinedo & Muñoz, 2014; Mitra & Ray, 2014). There are several studies on the relationship between economic variables and conflict, violence, war, rebellion, and so on. This literature particularly pays attention to the impact of conflict on the economy (Blattman &

Miguel, 2010; Collier & Hoeffler, 1998; Field et al., 2008; Murshed, 2007; Wärneryd, 2014). Given this, the present article is motivated by this question: do regional macroeconomic conditions affect the number of communal conflicts in Indonesian regions?

There are several case studies suggesting a causal effect from economic factors to violent conflict (Mitra & Ray, 2014; Thor & Evtuhovici, 2003; Wennmann & Krause, 2009; Wilson, 2011), and there are a few cross-country studies exploring the economic determinants of violent conflict, where the findings suggest, in general, that higher levels of economic growth, or per capita income, reduce the probability of violent conflict, specifically in civil war (Blattman & Miguel, 2010; Collier & Hoeffler, 1998; Kim, 2006; Miguel, Satyanath, & Sergenti, 2004; Murshed, 2007).

Being acquainted with the relevance of non-economic factors, Mitra and Ray (2014) explored a similar question in India: whether economic changes within groups affect Hindu-Muslim conflict. Their findings suggest a positive impact of income on intergroup violence, only in the case of Muslim groups. Nevertheless, the empirical literature using quantitative methods is limited.

Consequently, our contributions to the literature are threefold. First, we approach the main question at the regional level; this is a cross-regional study. Second, we use panel data and dynamic models (SYS GMM estimator) to assess the impact of economic factors on the number of conflicts—reevaluating the religion effect using dynamic models. Third, empirically we contribute to the economics of conflict, which has been underrated in comparison to the non-economic theories of conflict. Contrary to previous cross-country evidence, our findings suggest that economic growth does not affect conflict and only inflation has a significant effect, increasing regional communal conflict. We also did not find a significant impact of religion.

LITERATURE REVIEW

Non-Economic Determinants of Conflicts in Indonesia

Conflict in Indonesia is principally communal, that is, horizontal, based on religious and ethnic issues (Hendrajaya, Saifudin, Kaban, Agusyanto, & Sulistyawati, 2010; Sukma, 2005). More than 80% of Indonesian citizens are Muslims, and this proportion is similar by age groups. Christianity is the second major religion, around 10% of the population, while Hinduism, Buddhism, and Confucianism are the other main religions (Colbran, 2010). Moreover, in almost every Indonesian region (province), Islam is the religion for the great majority of the population, excluding Bali (Hinduism), East Nusa Tenggara (Christianity/Catholicism), North Sulawesi, and Papua (Christianity). In Poso, part of the Central Sulawesi region, the population is equally divided between Muslims and Christians (Sukma, 2005).

Based on a majority or minority approach, the Indonesian religious situation should be a basic trigger of disputes in society. Specifically, the communal conflict between Muslims and Christians has its origins in the Dutch colonial period. The most violent conflicts in the aftermath of the fall of the Suharto regime in 1998 occurred between these two groups. However, previous to these violent events, some studies argued that affairs between these religions in Indonesia tended to be positive and harmonious (Arifianto, 2009), suggesting that the direct causes of communal conflict cannot be religious (Bertrand, 2004; Sidel, 2006; van Klinken, 2007).

It is possible to identify several political features of the causes of conflict in Indonesia: the centralization of political power, political exploitation, and oppression. This transforms the political process to uniformity rather than unity and undermines local institutions. These

political characteristics seriously affect the life of indigenous people in conflict areas, and maintain the political stability in the pursuit of the elites' economic interests. In addition, the pattern of recruitment of leaders is top down; there is no goodwill for producing grassroot local leaders (Kassim, 2012; Sukma, 2005).[1]

Therefore, religion is a channel to reinforce conflicts, responding to political interests and interest groups. Moreover, religion may contribute to separatism and nationalism (Fox, 2002). In Indonesia, Arifianto (2009) claimed that these political maneuvers can be traced back to the Dutch colonial period when Christian missionaries actively received support from the government.

Ubbe (2011) described how the political events, crises, reforms, and transitions in Indonesia since 1998 have led to rapid changes in the relative positions of interest and social groups in all the substantive economic, political, and social areas. When the map of political power is not dominated by a single majority, or there is no a single dominant ethnic group in a particular territory, then the sources of conflict will arise easily (Barron et al., 2004).

Wilson (2011) used a case study approach and process-tracing to analyze the impact of Indonesian interest groups on violent conflict. Although inflammatory elite propaganda affects conflict, the evidence suggests that many participants acted by following their own interests to engage in violence, for example, political, material, or simple criminal interests.

The major causes of violent conflict, such as elite provocation, religion, ethnicity, nationalism, and separatism usually act together, and it is difficult to separate their impacts. However, the evidence suggests that religion does not directly cause conflict, but can seriously increase the violence of any kind of conflict (Fox, 2002; Kim, 2006).

Economic Determinants of Conflict

We can expect an increase in the number of conflicts in the case of negative shocks on GDP, at least, in the short-term (Blattman & Miguel, 2010; Field et al., 2008; Miguel et al., 2004). Low economic growth, through poverty and weak institutions, increases the risk of conflict (Murshed, 2007). However, there is also empirical evidence, at the national level, suggesting that higher levels of per capita income reduce the probability of civil war (Collier & Hoeffler, 1998), and findings suggesting statistically insignificant effects of economic growth on conflict (Kim, 2006). Thus, the international evidence is mixed, and the literature on conflict only marginally mentions the role of economic factors in the Indonesian case.

Our knowledge of the economics of conflict is centered on terrorism (Sandler, 2009) on the effects of conflict on economic outcomes, and it is scarce in comparison with the vast literature on other causes of conflict (Blattman & Miguel, 2010; Collier & Hoeffler, 1998; Fernández-de-Pinedo & Muñoz, 2014; Miguel et al., 2004; Wärneryd, 2014). Particularly, the empirical literature lacks quantitative methods for the analysis of the effects of economic variables on conflict.

Mitra and Ray (2014) developed a mathematical and theoretical model to represent intergroup conflict driven by economic progress within groups. They studied the relationship between income and violence, which does not contradict the causal effects of non-economic factors. Using panel data on Hindu-Muslim violence, and a Poisson specification, among other econometric methods to check robustness, their findings suggest that an increase in Muslim economic progress (as measured by per capita expenditure) leads to increase in conflict. Conversely, the evidence is statistically insignificant for Hindu groups. Similarly, in this research we link

macroeconomic variables to communal conflict at the regional level.

METHODS

Data

The data employed in this research are drawn from two major secondary sources. First, the Indonesian National Statistical Bureau (known by its Indonesian acronym, BPS), which is the main source used by government agencies and other national and international organizations; and second, the National Violence Monitoring System (known by its Indonesian acronym, SNPK), an organization which collects regional data and developed an Indonesian conflict map based on mass-media articles on local and national conflicts.

Indonesia today has 34 provinces, including the Special region of Yogyakarta, still governed by a pre-colonial monarchy. SNPK has been collecting data from the year 1998, but many Indonesian regions are new, and there is no data about local conflicts.[2] Consequently, we were able to develop a data set consisting of observations from 16 regions over the years 2004 to 2013 (see Table 1 and Figure 1).
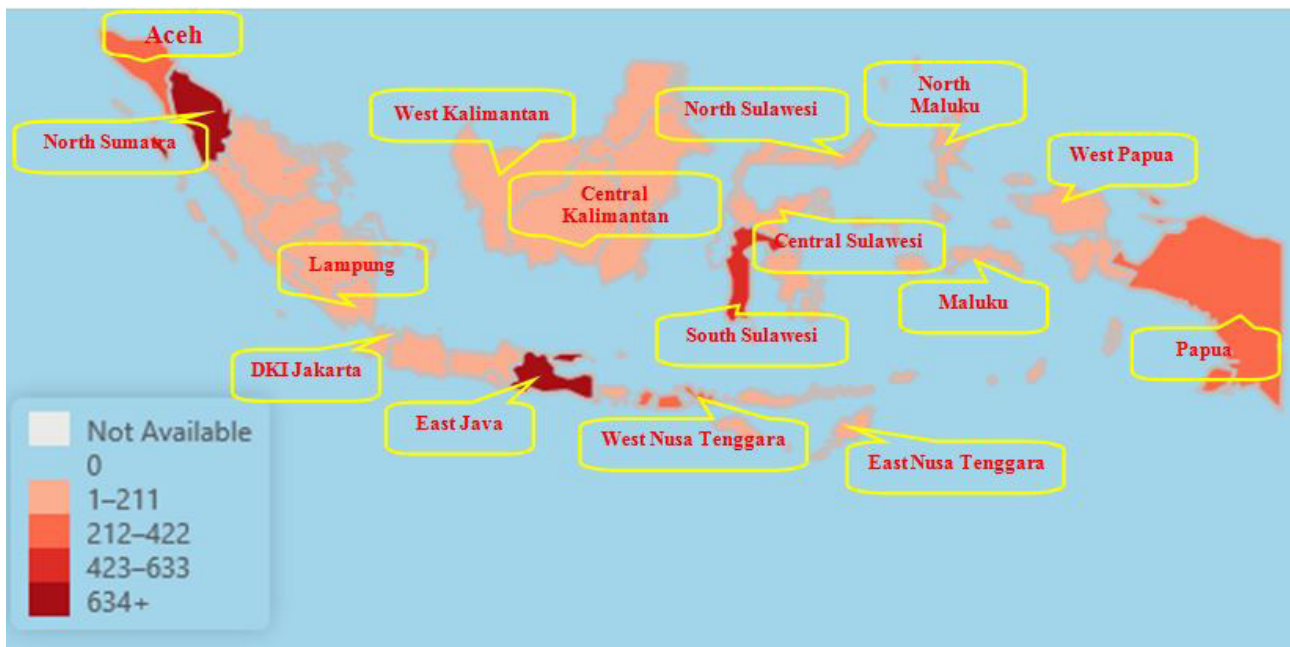
Figure 1. Conflict map based on number of incidents in 2013.

Source: National Violence Monitoring System (SNPK).

Table 1. *Regions Under Study, Muslim Population, and Conflict*

Region	Share of Muslim population 2010	Islam (dummy)	Natural resource conflict 2013	Governance conflict 2013	Elections and appointments conflict 2013	Separatist conflict 2013	Identity based conflict 2013	Popular justice conflict 2013	Other conflict 2013	Total conflicts 2013
Aceh	0.98	1	27	43	44	1	11	107	4	237
Central Kalimantan	0.74	1	31	2	10	0	1	50	5	99
Central Sulawesi	0.77	1	11	17	7	0	37	44	12	128
East Java	0.96	1	48	30	48	0	56	441	23	646
East Nusa Tenggara	0.09	0	42	4	13	0	21	48	15	143
Jakarta	0.85	1	46	30	9	0	95	388	33	601
Lampung	0.95	1	27	7	3	0	11	78	5	131
Maluku	0.51	0	42	9	19	0	33	25	8	136
North Maluku	0.74	1	11	23	31	0	18	36	4	123
North Sulawesi	0.31	0	17	9	9	0	44	90	32	201
North Sumatra	0.66	0	134	54	21	0	48	775	22	1054
Papua	0.16	0	34	24	14	32	25	114	54	297
South Sulawesi	0.90	1	45	39	58	0	157	153	42	494
West Kalimantan	0.59	0	5	9	4	0	1	45	1	65
West Nusa Tenggara	0.96	1	38	63	35	0	50	114	16	316
West Papua	0.38	0	2	23	5	1	7	42	8	88

Source: Indonesian National Statistical Bureau (BPS) and National Violence Monitoring System (SNPK). Authors' calculations.

Dependent and Independent Variables

Summary statistics of the dependent and independent variables used in this research can be seen in Table 2. The dependent variable is the number of communal conflicts, taken from SNPK. We merged the information for every type of conflict: natural resource conflict, governance conflict, elections and appointments conflict, separatist conflict, identity-based conflict, popular justice conflict, and other conflicts (see Table 1). In the regression analysis we use a ratio—the growth of the total number of conflicts (Conflict growth rate). This measure is used because absolute amounts can be biased by regional characteristics such as size and population.

Based on the theoretical and empirical literature of conflict, religion is used as a key explanatory variable.[3] We use two measures proposed by Mitra and Ray (2014): first, the percentage of Muslim population in the region at the year 2010, and second, a dummy variable equal to one if Islam is the major religion (greater than 70%), and zero otherwise (see Tables 1 and 2), because Islam is considered to be a religion more conflict prone than others (Fox, 2002).

Following the economic theory of conflict (Mitra & Ray, 2014), we use as independent variables the following regional macroeconomic indicators: the growth rate of Gross Regional Domestic Product (GRDP) at 2000 constant market prices, inflation rate, poverty rate, and the Human development index (HDI), which implicitly captures information about production, education, and health.[4] The correlation matrix (see Table 3) shows some relevant associations among GRDP, HDI, poverty rate, and the indicators of religion. Therefore, in the regression analysis we run and verify different specifications to avoid multicollinearity concerns.

In the aftermath of the 1998 fall of the Suharto dictatorship, several reforms were implemented to increase decentralization, political competition, and the population's welfare. Nevertheless, the regional macroeconomic indicators in our sample show negative or weak positive trends, excluding HDI (see Figure 2). The poverty rate has been decreasing, on average, in our sample. However, in some regions, the poverty rate has been the same since 2004, or just a little bit lower than before.[5]

Table 2. *Descriptive Statistics*

Variable	Obs	Mean	Std. Dev.	Min	Max
Number of conflicts	150	267.65	268.53	26	1246
Conflict growth rate (a)	134	1.07	0.34	0.45	2.76
GRDP rate (%)	160	5.79	5.76	-22.53	36.4
Inflation rate (%)	156	7.86	4.91	0.06	41.11
Poverty rate (%)	143	18.36	9.88	3.18	41.52
Human development index	160	70.19	3.92	60.6	78.59
Muslim population (%), year 2010	160	0.66	0.28	0.09	0.98
Islam (dummy)	160	0.56	0.50	0	1

(a) We do not use percentage to avoid negative values and to allow a logarithmic transformation of the variable.

Source: Indonesian National Statistical Bureau (BPS) and National Violence Monitoring System (SNPK). Authors' calculations.

Table 3. *Correlation Matrix (pairwise)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Number of conflicts (1)	1							
Conflict growth rate (2)	-0.01	1						
GRDP rate (3)	-0.01	0.20**	1					
Inflation rate (4)	-0.07	0.03	-0.17**	1				
Poverty rate (5)	-0.32***	0.10	-0.08	0.19**	1			
Human development index (6)	0.34***	-0.05	0.14*	-0.19**	-0.72***	1		
Muslim population (7)	0.35***	-0.04	-0.10	0.003	-0.43***	0.26***	1	
Islam (8)	0.18**	-0.01	-0.09	0.003	-0.41***	0.17**	0.85***	1

Pearson correlation coefficients.

(*) [**] and {***} indicate statistical significance at the (10%) [5%] and {1%} levels.

Source: Authors' calculations using data from the Indonesian National Statistical Bureau (BPS) and the National Violence Monitoring System (SNPK).
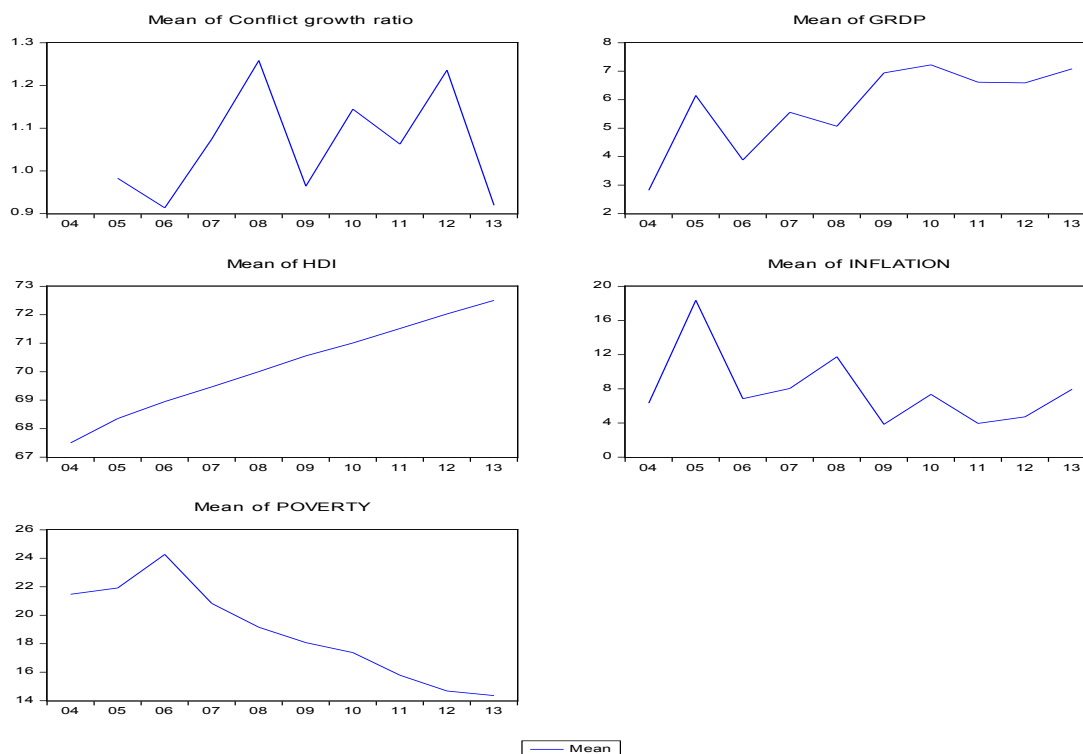
Figure 2. Mean of GRDP, inflation, poverty, and HDI (2004-2013).

Source: Authors' calculations using data from the Indonesian National Statistical Bureau (BPS) and the National Violence Monitoring System (SNPK).

Empirical Specification

Hypotheses. At the national level, the empirical evidence suggests that economic growth, or high per capita income, will reduce the probability of conflict. Conversely, Mitra and Ray (2014) claimed that increases in the income of one group increase the violence perpetrated against that group. We are analyzing communal conflict, closer to intergroup conflict; therefore, our hypothesis states that the GRDP rate will positively affect the number of conflicts (the conflict growth rate). That is, regions with a dynamic economy will experience more conflicts. We also expect a positive impact of the inflation rate on the conflict growth rate, because higher inflation will lead to a volatile economy.

These two macroeconomic indicators could present a threshold level, which is difficult to determine with our sample. However, the other two independent variables, the poverty rate and the HDI, can control for this possibility. We expect that the poverty rate positively correlates with the effort made to achieve personal interests, increasing the number of conflicts (Do & Iyer, 2010; Murshed, 2007). Conversely, using HDI, higher levels of development should diminish the number of conflicts because higher values of HDI means that the whole region has better social conditions. In other words, low levels of HDI increase the risks of conflict (Kim & Conceição, 2010).

We expect that regions where Islam is not a large majority will present higher rates of conflict, and we expect a positive sign for the dummy variable Islam, because this religion is prone to conflict, as we mentioned above.

Estimation Procedure

Panel data have several advantages in testing the working hypothesis. It is well known that panel data give "more informative data, more variability, less collinearity among variables, more degrees of freedom and more efficiency" (Baltagi, 2005, p. 5). In our case, it is particularly relevant that econometric models with panel data can control for stable independent variables, which are less likely to change during the period of analysis, as we can expect in the case of ethnicity, religion, linguistic groups, nationalism, separatism, formal and informal institutions, rural population, natural resources, and others. Consequently, we can obtain accurate measures of the specific impact from the regional economic factors.

However, it is easy to recognize a reverse causality between conflict and economic variables. A first option to account for endogeneity concerns is the use of instrumental variables (a complicated task because of data limitations). In addition, note the autoregressive characteristic of conflict; experience shows us that violence creates more violence. Violence can lead to stronger conflicts through two mechanisms: sympathy for victims and insecurity (Wilson, 2011).

Given this, the econometric literature recommends the generalized method of moments and dynamic panel models (DIF GMM or SYS GMM estimators). The number of time-series observations in our sample is relatively small, therefore, to obtain consistent and unbiased estimates of the effect of our economic variables on conflict we use the SYS GMM estimator as the baseline model (Blundell & Bond, 1998). This method uses the lagged dependent variable as a regressor (autoregressive characteristic), and the regressors were instrumented by themselves with their lagged levels and first differences (to correct endogeneity problems). If the model is not subject to serial correlation (in particular of second order) and the instruments are valid (Sargan's over-identification test is used to validate the instruments), then the estimator ensures efficiency and consistency.

The baseline empirical model to test the impact of regional macroeconomic variables is given by equation (1):

$$Ln\_Conflict\_growth\_rate_{it} = Ln\_ECONOMICS_{it\text{-}1}'\beta + \gamma_1 ISLAM_{it} + \gamma_2 JAP_t + T_t'\tau + u_{it} \qquad (1)$$

where *ECONOMICS* includes as independent variables: GRDP rate, inflation rate, poverty rate, and the HDI. These explanatory variables are lagged by one year to account for reverse causality, and they enter in logarithms (excluding GRDP). Note that this is a double-log model; the dependent variable also enters in logarithms. In this manner, the model achieves linearity and the coefficients measure elasticity.

ISLAM includes two measures: Percentage of Muslim population and the dummy variable Islam, previously defined. *JAP* is a dummy variable for Jakarta, Aceh, and Papua because in the period of analysis these regions are considered to be highly prone to conflicts, and with this dummy variable we can control for their specific impact. *T* represents time dummy variables controlling for the effects of unspecified national transitions and other market conditions.

RESULTS

The main results are reported in Table 4. In general, the dynamic model is well justified; the dependent variable as regressor shows statistical significance. The SYS GMM estimations are not subject to serial correlation of second order, and the instruments used are valid according to the Sargan test.

The regional macroeconomic variables show insignificant and non-robust effects on conflict growth rate, excluding the inflation rate. In other words, inflation is the only variable with the expected sing and significance in all the regressions. For a given small change in inflation, we expect an increase in the conflict growth rate of 0.15%, in both main specifications; when the model is controlling for the share of Muslim population and when the model includes

the dummy variable for Islam (note that we are reporting elasticity coefficients thanks to the double-log model).

When we exclude inflation from regressions, in any case, the other macroeconomic variables do not show significant and robust effects. The dummy for Jakarta, Aceh, and Papua does not have statistical significance, indicating that the results do not depend on these regions, and they do not differ from other regions under study. In addition, the variables about Muslim religion do not present statistically significant effects.

As additional robustness checks, we also estimated equation (1) using different combinations of the macroeconomic variables (avoiding potential multicollinearity concerns), and without the logarithmic transformation of dependent and independent variables. The results are very similar to those reported in Table 4. In addition, several equations were estimated using the DIF GMM method, and the main findings remain qualitatively the same. We also explored fixed and random effects regression models, where only the time dummy variables have statistical significance, but these regressions are biased because of endogeneity concerns. Some of these results are shown in Table 5.

CONCLUSIONS

We use dynamic panel models and the SYS GMM estimator (Blundell & Bond, 1998) to analyze the impact of regional macroeconomic variables on the number of communal conflicts in Indonesian regions. Our findings suggest that only the inflation rate predicts the conflict growth rate. These results differ from most of the cross-country evidence, where economic growth reduces the risk of violent conflict, principally of civil war. However, our findings present some similarities to Kim (2006), who did not find statistical significance for indicators of economic growth and development (GRDP and HDI).

Table 4. *Regressions: Conflict is Regressed on Regional Macroeconomic Variables*

	Pred Sign	Dependent variable: Conflict growth rate SYS GMM estimations			
		(1)	(2)	(3)	(4)
Lagged Dependent (Conflict growth rate in t-1)		-0.15 (0.11)	-0.23** (0.11)	-0.37*** (0.11)	-0.24* (0.14)
GRDP rate (%)	+	-0.003 (0.01)	-0.005 (0.01)	-0.003 (0.01)	-0.001 (0.005)
Inflation rate (%)	+	0.15*** (0.05)	0.15*** (0.05)		
Poverty rate (%)	+	-0.25 (1.24)	0.80 (1.51)	1.28 (0.80)	1.02 (2.00)
Human development index	-	0.12 (0.99)	-0.62 (1.32)	-0.83 (0.54)	-0.81 (1.73)
Muslim population (%), year 2010	-	-0.26 (0.50)		1.01 (1.46)	
Islam (dummy)	+		-0.61 (1.20)		0.11 (1.24)
JAP (dummy for Jakarta, Aceh, and Papua)		0.20 (0.46)	0.74 (0.72)	0.57 (0.42)	0.86 (0.86)
Year 2008 (dummy)		0.15 (0.14)	0.27 (0.17)	0.29*** (0.11)	0.29 (0.20)
Year 2009 (dummy)		-0.14 (0.24)	0.13 (0.26)	0.30* (0.19)	0.17 (0.33)
Year 2010 (dummy)		0.04 (0.33)	0.43 (0.45)	0.45* (0.25)	0.30 (0.53)
Year 2011 (dummy)		-0.03 (0.38)	0.52 (0.11)	0.57** (0.29)	0.41 (0.64)
Year 2012 (dummy)		0.19 (0.50)	0.69 (0.64)	0.75** (0.33)	0.60 (0.77)
Year 2013 (dummy)		-0.08 (0.57)	0.48 (0.74)	0.63* (0.39)	0.47 (0.95)
Period		2004 - 2013			
Observations		110	110	112	112
N x T		16 x 8	16 x 8	16 x 8	16 x 8
Sargan test (p-value)		5.4 (0.99)	3.51 (0.99)	6.86 (0.98)	4.79 (0.99)
First order serial correlation test (p-value)		-2.35 (0.02)	-2.04 (0.04)	-2.28 (0.02)	-2.47 (0.01)
Second order serial correlation test (p-value)		0.91 (0.36)	-0.005 (0.99)	0.59 (0.55)	1.24 (0.21)

Standards errors are in parenthesis.
Dummy variables for years 2004 to 2007 are not included to avoid multicollinearity.
 (*) [**] and {***} indicate statistical significance at the (10%) [5%] and {1%} levels.

Table 5. *Regressions: Conflict is Regressed on Regional Macroeconomic Variables*

	Pred Sign	Dependent variable: Conflict growth rate				
		DIF GMM (1)	DIF GMM (2)	Random Effects (3)	Random Effects (4)	Fixed Effects (5)
Lagged Dependent (Conflict growth rate in t-1)		-0.30*** (0.10)	-0.31*** (0.06)			
GRDP rate (%)	+	-0.004 (0.005)	-0.005* (0.003)	-0.003 (0.004)	-0.003 (0.004)	-0.005 (0.005)
Inflation rate (%)	+	0.18*** (0.05)	0.14*** (0.04)	0.04 (0.05)	0.04 (0.05)	0.04 (0.05)
Poverty rate (%)	+	2.00** (0.87)	0.82 (0.74)	0.05 (0.06)	0.06 (0.06)	0.46 (0.44)
Human development index	-	20.13 (32.18)		0.24 (0.73)	0.18 (0.70)	1.31 (4.23)
Muslim population (%), year 2010	-			-0.04 (0.10)		
Islam (dummy)	+				0.01 (0.05)	
JAP (dummy for Jakarta, Aceh, and Papua)				0.02 (0.07)	0.02 (0.06)	
Year 2008 (dummy)		0.25* (0.15)	0.23** (0.10)	0.21** (0.09)	0.21** (0.09)	0.21* (0.11)
Year 2009 (dummy)		0.07 (0.39)	0.21 (0.15)	-0.01 (0.09)	-0.01 (0.09)	0.01 (0.14)
Year 2010 (dummy)		0.34 (0.55)	0.48* (0.26)	0.18* (0.10)	0.18* (0.10)	0.24 (0.19)
Year 2011 (dummy)		0.20 (0.75)	0.45 (0.31)	0.12 (0.09)	0.12 (0.09)	0.19 (0.22)
Year 2012 (dummy)		0.46 (0.92)	0.72** (0.37)	0.30*** (0.10)	0.30*** (0.10)	0.39 (0.26)
Year 2013 (dummy)		0.16 (1.10)	0.51 (0.44)	-0.004 (0.10)	-0.0003 (0.10)	0.10 (0.30)
Period		2004 - 2013				
Observations		94	94	120	120	100
N x T		16 x 7	16 x 7	16 x 9	16 x 9	16 x 9
R-squared				0.16	0.16	0.06
Sargan test (p-value)		6.14 (0.90)	8.18 (0.77)			
First order serial correlation test (p-value)		-2.58 (0.009)	-2.17 (0.03)			
Second order serial correlation test (p-value)		-1.46 (0.14)	-0.94 (0.34)			

Standards errors are in parenthesis.
Dummy variables for years 2004 to 2007 are not included to avoid multicollinearity.
(*) [**] and {***} indicate statistical significance at the (10%) [5%] and {1%} levels.

Moreover, our findings partially agree with Mitra and Ray (2014) who argued that intergroup conflict is driven by economic progress. At the regional level, we can say that an unstable economy, approached by inflation, is a driver of communal conflict. In addition, religion, which usually is a key explanatory variable of conflict, did not present statistically significant effects. This result coincides with other studies arguing that the direct causes of violent conflicts cannot be religious, but it can be a channel to reinforce conflicts (Bertrand, 2004; Fox, 2002; Kim, 2006; Sidel, 2006; van Klinken, 2007).

Future research for Indonesia about the economic determinants of conflict should attempt to investigate the effects of other macroeconomic indicators, such as inequality and education. Moreover, future studies should improve the sample size and analyze the impact of typical explanatory variables, such as politics and ethnicity, jointly with the economic determinants of conflict rather than assume that they are unchanged as we did because of data limitations.

ENDNOTES

[1] The first direct election of regional leaders started in 2005.

[2] It is interesting to mention that the regional autonomy laws are recently promoting a decentralization process. Nowadays, many responsibilities have been delegated to regional governments, including the local budgeting. The central government still have six main authorities on foreign affairs, defence, security, legislation, monetary and fiscal policy, and religion. Nevertheless, this regional autonomy results in imbalance situations between the richest and poorest regions (Bell, 2003).

[3] We do not have sufficient information to use other typical explanatory variables, such as ethnicity and political factors. However, we can assume that the correlation between religion and these other factors is high, they do not change significantly over the period of analysis, and the panel data controls for their impacts.

[4] We also explored other regional macroeconomic indicators, such as unemployment, education, inequality, and so on. Unfortunately, these indicators are available only for a few regions and years.

[5] Poverty rate is the percentage of population living with a monthly per capita expenditure below the poverty line (minimal expenditure to satisfy basic needs).

REFERENCES

Arifianto, A. (2009). Explaining the cause of Muslim-Christian conflicts in Indonesia: Tracing the origins of Kristenisasi and Islamisasi. *Islam and Christian-Muslim Relations*, *20*(1), 73–89. doi:10.1080/09596410802542144

Baltagi, B. (2005). *Econometric analysis of panel data* (3rd ed.). Chichester, West Sussex, England: JohnWiley & Sons.

Barron, P., Kaiser, K., & Pradhan, M. (2004). *Local conflict in Indonesia: Measuring incidence and identifying patterns* (Working Paper No. 3384). Washington, DC: World Bank. Retrieved from http://books.google.com/books?hl=en&lr=&id=yrmlpklXPVUC&oi=fnd&pg=PA11&dq=Local+Conflict+in+Indonesia+Measuring+Incidence+and+Identifying+Patterns&ots=u7b_qOJ95f&sig=8A48YheEHMr1_mMXS0DD-mG1LzY

Bell, G. F. (2003). Indonesia: The new regional autonomy laws , two years later. *Southeast Asian Affairs*, (1), 117–131.

Bertrand, J. (2004). *Nationalism and ethnic conflict in Indonesia*. New York, USA: Cambridge University Press. Retrieved from http://books.google.com/books?hl=en&lr=&id=2oZQRuT78JIC&oi=fnd&pg=PR11&dq=Nationalism+and+Ethnic+Conflict+in+Indonesia&ots=3TxmMErAvk&sig=DzcB_Zf8Tq3h4h-TvBlBtcJTz9g

Blattman, C., & Miguel, E. (2010). Civil war. *Journal of Economic Literature*, *48*(1), 3–57. doi:10.1257/jel.48.1.3

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143. doi:10.1016/S0304-4076(98)00009-8

Colbran, N. (2010). Realities and challenges in realising freedom of religion or belief in Indonesia. *The International Journal of Human Rights*, *14*(5), 678–704. doi:10.1080/13642980903155166

Collier, P., & Hoeffler, A. (1998). On economic causes

of civil war. *Oxford Economic Papers*, *50*(4), 563–573. Retrieved from http://oep.oxfordjournals.org/content/50/4/563.short

Departemen Pertahanan Republik Indonesia. (2008). *Buku putih pertahanan Indonesia 2008*. Jakarta, Indonesia: Departemen Pertahanan RI.

Do, Q.-T., & Iyer, L. (2010). Geography, poverty and conflict in Nepal. *Journal of Peace Research*, *47*(6), 735–748. doi:10.1177/0022343310386175

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. (2008). On the salience of ethnic conflict. *American Economic Review*, *98*(5), 2185–2202. Retrieved from http://www.jstor.org/stable/29730167

Fearon, J. D., & Laitin, D. D. (2003). Ethnicity, insurgency, and civil war. *American Political Science Review*, *97*(1), 75–90. Retrieved from http://journals.cambridge.org/abstract_S0003055403000534

Fernández-de-Pinedo, N., & Muñoz, F.-F. (2014). Economía y conflicto: Urgencias del presente y lecciones del pasado. *Cuadernos de Economía (Spanish Journal of Economics and Finance)*, *37*(105), 159–168.

Field, E., Levinson, M., Pande, R., & Visaria, S. (2008). Segregation, rent control, and riots: The economics of religious conflict in an Indian city. *The American Economic Review: Papers & Proceedings*, *98*(2), 505–510. Retrieved from http://www.jstor.org/stable/29730072

Fox, J. (2002). In the name of God and nation: The overlapping influence of separatism and religion on ethnic conflict. *Social Identities*, *8*(3), 439–455. doi:10.1080/1350463022000029995

Hendrajaya, L., Saifudin, A. F., Kaban, P., Agusyanto, R., & Sulistyawati, E. (2010). *Ragam Konflik di Indonesia: Corak Dasar dan Resolusinya*. Jakarta, Indonesia: Departemen Pertahanan Republik Indonesia.

Kassim, Y. R. (2012). Leadership contestations, succession, and stability in Malaysia and Indonesia. *Asia-Pacific Social Science Review*, *12*(1), 19–30.

Kim, H. S. (2006). The determinants of internal conflict in the Third World. *The Whitehead Journal of Diplomacy and International Relations*, *7*(2), 91–106. Retrieved from http://blogs.shu.edu/diplomacy/files/archives/09Kim.pdf

Kim, N., & Conceição, P. (2010). The economic crisis, violent conflict, and human development. *International Journal of Peace Studies*, *15*(1), 29–43. Retrieved from http://www.jstor.org/stable/41852999

Miguel, E., Satyanath, S., & Sergenti, E. (2004). Economic shocks and civil conflict: An instrumental variables approach. *Journal of Political Economy*, *112*(4), 725–753. Retrieved from http://www.jstor.org/stable/10.1086/421174

Mitra, A., & Ray, D. (2014). Implications of an economic theory of conflict: Hindu-Muslim violence in India. *Journal of Political Economy*, *122*(4), 719–765. Retrieved from http://www.jstor.org/stable/10.1086/676316

Montalvo, J. G., & Reynal-Querol, M. (2005). Ethnic polarization, potential conflict, and civil wars. *American Economic Review*, *95*(3), 796–817. Retrieved from http://www.jstor.org/stable/4132741

Murshed, S. M. (2007). *The conflict-growth nexus and the poverty of nations* (Working Paper No. ST/ESA/2007/DWP/43). New York, USA: United Nations. Retrieved from http://ideas.repec.org/p/une/wpaper/43.html

Sandler, T. (2009). The past and future of terrorism research. *Revista de Economia Aplicada*, *17*(50), 5–25.

Sidel, J. T. (2006). *Riots, pogroms, jihad: Religious violence in Indonesia*. Ithaca, New York: Cornell University Press. Retrieved from http://books.google.com/books?hl=en&lr=&id=UuL4PqvYPoMC&oi=fnd&pg=PR9&dq=Riots,+Pogroms,+Jihad:+Religious+Violence+in+Indonesia&ots=wiFIoy886x&sig=uTO6-OabhRJEFUaEtfLSgAntE2o

Sukma, R. (2005). Ethnic conflict in Indonesia: Causes and the quest for solution. In S. Kusuma & S. Thompson (Eds.), *Ethnic conflicts in Southeast Asia* (pp. 1–41). Singapore: Institute of Southeast Asian Studies. Retrieved from http://bookshop.iseas.edu.sg

Thor, E., & Evtuhovici, R. (2003). Alternative dispute resolution and peace making for resolving agribusiness and food management conflict resolution in the free trade area of the Americas grass roots initiatives with international

applications. *International Food and Agribusiness Management Review*, *5*(3). Retrieved from http://ageconsearch.umn.edu/handle/34339

Ubbe, A. (2011). *Laporan pengkajian hukum tentang mekanisme penanganan konflik sosial*. Jakarta, Indonesia.

van Klinken, G. (2007). *Communal violence and democratization in Indonesia: Small town wars*. New York, USA: Routledge Taylor & Francis group. Retrieved from http://books.google.com/books?hl=en&lr=&id=x6Wf1vjz-PYC&oi=fnd&pg=PP1&dq=Communal+Violence+and+Democratization+in+Indonesia:+Small+town+wars&ots=lwXx_pfyv9&sig=HVBGYwSv_Vmku7HlRvLDPLRWNBw

Wärneryd, K. (Ed.). (2014). *The economics of conflict: Theory and empirical evidence*. USA: MIT Press.

Wennmann, A., & Krause, J. (2009). *Managing the economic dimensions of peace processes: Resource wealth, autonomy, and peace in Aceh*. Geneva, Switzerland: Graduate Institute of International and Development Studies. Retrieved from https://repository.graduateinstitute.ch/record/4058/files/WP-2011-006.pdf

Wilson, C. (2011). Provocation or excuse?: Process-tracing the impact of elite propaganda in a violent conflict in Indonesia. *Nationalism and Ethnic Politics*, *17*(4), 339–360. doi:10.1080/13537113.2011.622629