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DO WORKING MEN REBEL? INSURGENCY AND UNEMPLOYMENT IN IRAQ AND THE PHILIPPINES

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ABSTRACT

Most aid spending by governments seeking to rebuild social and political order is based on an opportunity-cost theory of distracting potential recruits. The logic is that gainfully employed young men are less likely to participate in political violence, implying a positive correlation between unemployment and violence in places with active insurgencies. We test that prediction on insurgencies in Iraq and the Philippines, using survey data on unemployment and two newly- available measures of insurgency: (1) attacks against government and allied forces; and (2) violence that kills civilians. Contrary to the opportunity-cost theory, we find a robust negative correlation between unemployment and attacks against government and allied forces and no significant relationship between unemployment and the rate of insurgent attacks that kill civilians.

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Introduction

The vast majority of aid money spent to reduce political violence is motivated by an opportunity-cost theory of distracting recruits. Two causal logics underlie this theory[1]. The most commonly cited is that gainfully employed young men are less likely to participate in insurgent violence[2]. A slightly less prominent argument is that unemployment creates grievances, generating support for insurgent violence[3]. This support could lead to more violence directly—through more recruits or enhanced fundraising—or indirectly—by reducing the willingness of a population to share information with counter insurgents. Whichever causal pathway is posited, the testable implication is the same: there should be a positive correlation between unemployment and insurgent violence. We test that prediction on data from Iraq and the Philippines, using unemployment surveys and two newly- available measures of insurgency: (1) attacks against government and allied forces; and (2) violence that kills civilians.

The opportunity-cost approach is based upon a number of often implicit assumptions about the production of insurgent violence. Some of these include:

- Participation in insurgency is a full-time occupation, in the sense that individuals cannot be legitimately employed and active insurgents at the same time.
- Insurgency is a low-skill occupation so that creating jobs for the marginal unemployed reduces the pool of potential recruits.
- The supply of labor is a binding constraint on insurgent organizations.

Each of these assumptions is questionable in some contexts, suggesting first that empirical testing is warranted, and second, that the relationship between unemployment and insurgency may be more complex than is commonly assumed.

A number of alternative possible causal channels actually predict a *negative* correlation between unemployment and violence. Suppose, for example, that the main constraint on the production of violence is the extent to which non-combatants share information about insurgents with the government (Kalyvas, 2006; Berman, Shapiro and Felter, 2008). This might imply no correlation between unemployment and violence, or, if counterinsurgents spend money to buy intelligence –as they routinely do, as the local employment picture worsens and household incomes drop, the marginal dollar spent to buy information will go further and violence will fall.

Alternatively, suppose that security efforts—establishing checkpoints and the like—reduce violence but also increase unemployment by impeding the movement of goods and services. That would imply a negative correlation between unemployment and violence. Or, fighting a perceived occupying force might be something people do out of belief in the cause, but can do only once basic needs are accounted for. If insurgency is a normal "good" in this narrow sense, then an improved economic situation could lead to greater levels of participation and hence

[1] United States Army Counterinsurgency Field Manual, 2006.
[2] General Chiarelli, the U.S. Army Commander of Multinational Forces in Iraq, made this argument in a press briefing, December 8, 2006.
[3] See, for example, Brainard and Chollet, 2007, p. 3.

greater violence so that reduced unemployment causes more violence. We survey other alternative theories below.

To empirically distinguish between theories we use panel data on local unemployment and insurgent violence in two countries: Iraq and the Philippines. These countries vary greatly both in geography and in the nature and intensity of the insurgencies they face. Yet they yield broadly similar results.

Using a variety of statistical models we find that the data rule out a positive correlation between unemployment and violence for both the Iraqi and Philippine insurgencies; if there is an opportunity cost effect, it is not dominant in either case. Why is the correlation of unemployment and violence generally negative? Existing data do not allow us to fully adjudicate between possible reasons, but we offer preliminary evidence that it is due to the relationship between local economic conditions and counterinsurgents' efforts to combat violence. Our findings are consistent with two hypotheses concerning counterinsurgency: (1) as local economic conditions deteriorate, government forces and their allies are able to buy more intelligence on insurgents (i.e., the price of information falls); and (2) efforts to enhance security—establishing checkpoints and the like—damage the economy.

The remainder of this paper describes our effort to study the relationship between unemployment and insurgent violence in Iraq and the Philippines. First, we briefly review the existing literature on this relationship. We then describe our data, report estimation results, and conclude.

Literature Survey

Three major theoretical arguments link unemployment and violence at the local level. The first is the opportunity-cost approach which first surfaces in Becker's theory of crime (Becker, 1968). Grossman (1991) applies it to rebels' time-allocation, predicting that as opportunities for potential rebels to work in legitimate occupations improve, the amount of time they will provide to insurgency declines.

The opportunity-cost approach is incorporated in Fearon's (2008) model that predicts insurgent violence will increase in income inequality as relatively poor rebels see more to gain from expropriating resources of the relatively rich. That links opportunity costs to a second theoretical mechanism –appropriation, or rent capture—the idea that the greater the economic gains associated with controlling an area, the greater the effort rebels will invest in violent capture. Blattman and Miguel (2009) provide a general survey.

A third major theoretical argument is the hearts-and-minds approach, which states that the key predictor of violence is the attitude of the population towards the government. That attitude in turn predicts whether insurgents can survive to conduct attacks against a militarily superior foe. This strain of thinking has been most prominent among practitioners of insurgency and counterinsurgency. Mao Tse-Tung famously argued the people are "the sea in which rebels must swim" (Mao, 1937). Counterinsurgency theorists from the post-Colonial wars relied on

similar arguments about the criticality of the population's attitudes[4], as did the Iraq/Afghanistan cohort of Western counterinsurgents.[5] Importantly, this literature stresses that it is not the ability to recruit combatants that constrains insurgents, but rather the ability to induce non-combatants to withhold information from counterinsurgents. Akerloff and Yellen (1994) present an analytical statement of this approach, arguing that excessive punishment will fail to deter urban street gangs if the community responds by withholding information police need to catch gang members. Berman, Felter, and Shapiro (2008) apply "hearts and minds" logic to analyze the response of violence to reconstruction and social service provision programs in Iraq, testing the logic that these programs cause noncombatants to favor the government side, inducing them to share information with counterinsurgents.

Evidence generally supports opportunity-cost theory at the sub-national level with respect to crime. Studies show that in the United States crime rates increase as wages in the legal economy fall and as unemployment rises (Grogger, 1998; Gould et al 2002; Raphael and Winter-Ebmer, 2001). A similar pattern has been observed with respect to insurgency in rural Columbia where increases in prices of agricultural commodities predict reduced insurgent violence (Dube and Vargas, 2008). These findings are consistent with cross-country evidence that low GDP/capita predicts civil wars (Collier and Hoeffler, 1998; Fearon and Laitin, 2003); that correlation holds even when using rainfall to identify exogenous variation in GDP/capita (Miguel et al, 2004).

Little formal quantitative research has been reported which tests opportunity cost theory in the context of political violence, or that tests hearts-and-minds theory, though the literature cited above is rife with supportive anecdotal evidence. This is unfortunate, as determining which mechanism is dominant—hearts and minds or opportunity costs— is critical to properly designing economic aid programs in efforts to rebuild social and political order.

Data[6]

We study the relationship between unemployment and violence at the local level in Iraq and the Philippines. In both countries we collected observations of these variables for the smallest geographical units for which reliable population data were available, the district (n=104) in Iraq and the province (n=76) in the Philippines.

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[4] This view is largely based on the British experience in Malaya, the French in Algeria and the U.S. in Vietnam. It is explained in Triquier, 1961; Taber, 1965; Galula, 1964; Clutterbuck, 1966; Thompson, 1966; Kitson 1971 and Popkin 1979.

[5] Articles by practitioners in this vein include Sepp, 2005; Patraeus, 2006; Cassidy, 2006; and McMaster 2008. This is distinct from Berman and Laitin 2008, and Berman 2009, who argue certain rebel clubs do not share information with noncombatants, and are thus unaffected by actions of noncombatants. Economic development and improved governance still play a role in countering these clubs, though, as their social-service providing organizational bases are vulnerable to competition.

[6] Data provided by the Empirical Studies of Conflict (ESOC) Project. For questions about replication data please contact Shapiro.

In both cases our key dependent variable is the intensity of insurgent activity measured as the rate of attacks per capita against government forces and their allies. We generate these measures by aggregating incident-level data and focus on the rate of incidents because tightly geo-located data on Coalition and insurgent casualties are not publicly available for Iraq. To maintain comparability of our estimates across countries we use incident rates as our primary dependent variable.

For Iraq we use two data sources on violence. The first are data drawn from 'significant activity' (SIGACT) reports submitted by Coalition forces. These capture a wide variety of information about "…executed enemy attacks targeted against coalition, Iraqi Security Forces (ISF), civilians, Iraqi infrastructure and government organizations" (Government Accounting Office, 2007; Department of Defense, 2008). Unclassified data drawn from the Multi-National Forces Iraq SIGACTS III Database provide the location (to approximately 100 meters), date, and time of attack for incidents between February 2004 and July 2008.[7] We filtered these data to exclude violence not directed at Coalition and Iraqi government targets leaving a data set of 148,546 incidents spanning February 2004 – December 2007.

Because the unclassified information from the SIGACT data do not measure the consequences of attacks we supplement them with data from Iraq Body Count (IBC), which uses press reporting to identify incidents that kill non-combatants. The IBC data capture 13,335 incidents in which civilians were killed (that can be accurately geo-located). These incidents account for 49,391 civilian deaths. Each incident includes a reported target. We divide these killings into three categories, which will provide analytical leverage on the relationship between unemployment and violence:

1. Insurgent killings of civilians in the course of attacking Coalition or Iraqi government targets.
2. Coalition killings of civilians.
3. Sectarian killings, which includes all killing of civilians not falling in the other categories, capturing ethnic cleansing, reprisal killings, and the like.

To generate data on insurgent attacks in the Philippines we coded unclassified details of over 21,000 individual internal security incidents reported by the Armed Forces of the Philippines from 2001-2008. These data were compiled from the original field reports of every operational incident reported during this period to the Armed Forces of the Philippines' Joint Operations Center by units conducting counterinsurgency and other internal security operations. Information coded from these reports include the date, location, and description of each incident. Each incident was assigned a unique location identification number that allows it to be plotted at the village level.

[7] The information provided in the unclassified SIGACT data are limited to the fact of and type of terrorist/ insurgent attacks (including improvised explosive devices [IEDs]) and the estimated date and location they occurred.

In both countries the lack of fine-grained data on unemployment is the limiting factor in our analysis. In Iraq three surveys capture unemployment at the district level: the Iraq Living Conditions Survey (ILCS) which was fielded in March and April 2004, the 2005 World Food Program Food Security and Vulnerability Analysis in Iraq (June and July 2005), and the World Food Program Food Security and Vulnerability Analysis in Iraq (November and December 2007). In the Philippines we obtained provincial level unemployment rates from the Republic of the Philippines Census Organization's Labor Force Survey (LFS) for 2001 through 2003.

To maximize the accuracy of our estimates we focus on periods when the data on unemployment were being collected. For Iraq this leaves us with 297 observations: 99 districts (five not surveyed) over three quarters when surveys were in the field (Q1:04, Q2:05, Q4:07). For the Philippines this approach yields 228 observations: 76 provinces over three years during which we observe both unemployment and violence (2001 – 2003). Table 1 provides population-weighted summary statistics for key variables.

[INSERT TABLE 1 ABOUT HERE.]

Two facts stand out from Table 1. First, the insurgency in Iraq is substantially more intense than that in the Philippines during the periods under study. Second, provinces in the Philippines are larger than districts in Iraq, so our estimates for Iraq will be more precise.

Estimation

We seek to estimate the relationship between violence and unemployment in the equation

$$(1) \qquad v_{it} = \alpha_i + \beta u_{it} + \gamma_t + \varepsilon_{it} ,$$

where v measures the incidence of violence, u is the unemployment rate, i indicates region (districts in Iraq, provinces in the Philippines), α_i are region-specific fixed effects, and γ_t are period effects. Bearing in mind that violence is likely to reduce employment (by discouraging investment, consumption and production) we will interpret our estimate of the best linear predictor, β, as an underestimate of the causal effect of unemployment on violence.

Table 2 reports regression analysis for Iraq and the Philippines. The dependent variable in all specifications is the number of attacks against government forces—a category that includes both Coalition and Iraqi government forces in the Iraqi SIGACTS data. The key independent variable is the unemployment rate in that district/quarter (Iraq) or province/year (Philippines). In Table 2 we report linear regressions on the number of attacks per 1,000 population. (Since violence is measured by over-dispersed count data, we also report negative binomial regressions controlling for population in Supplemental

Table S1. Those results are consistent with and statistically more significant than those discussed in the text below.)

We control for time-invariant region-specific characteristics in two ways. First, since both conflicts have an ethnic component we employ ethnicity controls: the Sunni vote-share in the December 2005 election for Iraq and the Muslim population share for the Philippines. Second, we employ region fixed-effects which control for all time-invariant region-specific factors (including ethnicity measures). In all regressions we use year fixed-effects to control for secular trends affecting the entire country. Finally, we re-run the analysis using only regions that may have different forms. In Iraq we focus on Baghdad (where population density may constrain rebels and coalition forces –as we discuss below). For the Philippines we focus on provinces with more than five percent Muslim population.

[INSERT TABLE 2 ABOUT HERE.]

Our key finding is reported in Table 2: the estimated coefficient on unemployment is negative in both conflicts. Unemployment predicts less violence. This result remains true even after controlling for a wide range of possible confounding factors using time and space fixed effects. In Iraq we can reject a positive coefficient in all specifications at the 95% confidence level. The results are somewhat weaker for the Philippines but the correlation is consistently negative, especially in the more Muslim provinces where the insurgency is concentrated.

This negative coefficient is particularly striking when we consider that it is probably biased upwards by a reverse-causal relationship in which violence increases unemployment through the damage it does to the economy. It is also large, at least in Iraq, indicating that a 10% increase in unemployment from the mean level (from 10% to 11%) is associated with a 5.4% decrease in incidents/1000/quarter for the entire country and a 6.9% decrease in Baghdad. This equates to 8 less attacks per district/quarter in average size district and 14 less per district/quarter for average districts in Baghdad. While we can't learn too much statistically from three waves of nine districts in Baghdad, it does illustrate the pattern we see throughout Iraq. Figure S1 plots the data for Baghdad to illustrate the fixed effects regression in column 4, with changes in incidents plotted against changes in unemployment rates in both 2004-05 and 2005-07.[8] These results are not driven by any particular outlier, but rather by the pattern that played out in some of Baghdad's largest districts: violence fell while unemployment rose in Sadr City, Al-Resafa and Adhamiya in 2004-05, but subsequently rose while unemployment fell in the same three districts in 2005-07.

[INSERT FIGURE S1 ABOUT HERE.]

[8] The very small district of Tarmia is omitted from the Figure as it is an outlier and forces rescaling of the graph. It is included in the regression analysis in Table 2, though it has no substantial effect on the results.

These results do not imply that policies which increase employment cause violence, but they must lead us to doubt whether those policies actually decrease violence. What they certainly suggest is that the relationship between employment and violence is perhaps more complex than has been commonly assumed. To probe possible explanations for this pattern we now turn to a closer examination of the Iraqi insurgency where the negative correlation between unemployment and violence is strongest.

Ruling out the 'Surge' and 'Anbar Awakening'

The first obvious concern with the results for Iraq in Table 2 is that they may be driven by factors not controlled for by region and year fixed effects. Suppose, for example, that the "surge" in Baghdad in 2007 reduced violence but also strangled the local economy as military units built walls around specific neighborhoods and established checkpoints through the city. We would then observe a negative correlation between unemployment and violence not because unemployment increases violence but because the surge increased the former while reducing the latter. Alternatively, we might have spurious effects because of the politically driven reduction in violence in Sunni areas between August 2006 and December 2007, due to the 'Anbar awakening'. To rule out these possibilities we re-ran the basic fixed-effect regressions for Iraq but stratified the sample by period and region. Table 3 reports these results.

[INSERT TABLE 3 ABOUT HERE.]

We can again reject the null hypothesis of a positive correlation between unemployment and violence at the 95% confidence level for the full three years observed and for 2004-05 in Baghdad. In the 2004-5 period we can reject the null of a positive relationship between unemployment and violence at the 94% confidence level for the entire country. The negative correlation becomes substantially weaker during the 2005-07 interval that includes the "surge," so we can rule out the possibility that our results reflect either: (1) the building of walls and placement of additional troops in Baghdad in 2007 which caused both high unemployment and low violence; or (2) the major changes in patterns of violence from mid-2006 on.

Replication

Are these results somehow particular to officially-collected incident data? The top panel of Table 4 replicates the results in Table 3 using the Iraq Body Count data. It reports the results of a regression of incidents in which civilians were killed on unemployment rates. The results are not very informative, as they are not statistically significant –regardless of perpetrator; but they certainly do not show a positive correlation of unemployment and violence.

[INSERT TABLE 4 ABOUT HERE.]

The lower panel of Table 4 repeats the exercise using as an outcome measure the number of civilian casualties rather than the number of incidents involving civilian casualties. Here a positive correlation appears for Insurgent-perpetrated casualties, though only in Baghdad. This exception in Baghdad may appear to be supportive evidence for an opportunity cost theory, but it is more likely evidence of a tactical failure by insurgents. Recall that these are incidents in which insurgents targeted coalition forces but killed civilians. We know from internal insurgent documents that many groups regard collateral damage—as distinct from intentionally targeting civilians—as politically problematic (Fishman and Moghadam, 2008). We revisit tactical failure below.

Why a negative correlation?

The negative correlation between unemployment and attacks against Coalition and Iraqi government forces is consistent with at least three theories: (1) predation – insurgent violence rises in economically advantaged periods and areas because those areas become more valuable; (2) security effects – both unemployment and insurgent violence reflect government security efforts, which simultaneously suppress both; and (3) information – counterinsurgents can operate more effectively in areas with high unemployment because the cost of information is lower.

This section attempts to distinguish between these possibilities using data from Iraq. Security and information mechanisms share the characteristic that unemployment proxies for factors that limit the operational effectiveness of insurgents. To measure that effectiveness we calculate *insurgent precision*, the proportion of attacks on coalition forces that kill no civilians. It is the difference between SIGACT and IBC incidents, divided by SIGACT incidents. We think of it as a reasonable proxy for the ease with which insurgents can attack Coalition forces.

All three theories predict the negative relationship between unemployment and insurgent violence which we observe. Both the security effect and information cost theories predict a negative relationship between unemployment and insurgent precision while the predation story has no firm prediction. Both security and information effects should be strongest in more densely populated areas where the risk of killing civilians in any attack is greater, and hence the negative correlation between unemployment and insurgent precision should be strongest in densely populated areas.

In terms of an estimating equation, we have

$$(2) \qquad p_{it} = \alpha_i + \beta u_{it} + \delta d_{it} + \theta u_{it} d_{it} + \gamma_t + \varepsilon_{it} ,$$

where p is insurgent precision, d is population density, u is measured as before (and the parameters and residuals are distinct from their Greek namesakes in (1)). Security effect and information cost theories predict that the coefficient on unemployment, β, will be negative in a short regression, and that the coefficient on the interaction, θ, will be negative in the long regression. As before, we don't think of these estimated coefficients as causal effects, but –

assuming that reverse causality between precision and unemployment is second order—we are confident in interpreting the coefficients as tests of the theory.

Table 5 reports this analysis. Three facts stand out. First, high unemployment is weakly associated with low insurgent precision in all sample periods, though not significantly. Second, if we include population density and an interaction term in the regression, we find that insurgent precision is much lower in densely populated areas.[9] This makes sense, as civilians are unfortunately more likely to be affected by shrapnel, over-pressure, and stray small arms fire in densely-populated areas. Third, and most importantly, once we control for this density effect there is a strong negative coefficient on the interaction term between unemployment and population density, indicating that in the dense urban districts of Iraq unemployment was associated with reduced precision in both sample periods. This last result is consistent with both the security effects and information costs explanations for the negative correlation.

[INSERT TABLE 5 ABOUT HERE.]

Taken as a whole these results are consistent with the conjecture that insurgents switch tactics when unemployment is high, restricting themselves to weapons that allow less precise targeting of coalition forces (e.g., sensor-activated IEDs vs. command-detonated ones) and thus inadvertently kill civilians. What we cannot determine from these data is whether that tactical switch is due to 1) increased security pressure, such as checkpoints, barriers, and patrols – that raise unemployment by restricting the movement of goods and services; or 2) improved information flows to coalition forces about insurgent activities, as the price of leaks declines when unemployment rises.

Conclusion

Our findings of the relationship between unemployment and insurgency in Iraq and the Philippines call into question the opportunity cost theory that dominates thinking in policy circles. These results suggest that any opportunity cost effects—at least in these two cases—are overshadowed by other forces.

A closer look at the data from Iraq provide evidence for an alternative view of unemployment and violence: high unemployment is associated with a difficult operating environment for insurgents, either because unemployment is an inadvertent side-effect of effective security pressure, or because the price of information about insurgent activity is lower in a depressed economy. Evidence for these alternative views is suggestive, but not conclusive.

The negative correlation of unemployment with violence indicates that aid and development efforts that seek to enhance political stability through short-term job creation

[9] Note also that population density is sufficiently time-varying in Iraq during the war to allowing coefficients to be precisely estimated in a fixed-effects regression. This reflects tragically high rates of internal displacement and refugee migration.

programs may well be misguided. Development funds might be directed instead at improving the quality of local government services, thereby inducing noncombatants to share intelligence about insurgents with their government and its allies, an effect we've found supportive evidence for in previous research (Berman, Shapiro and Felter, 2008). Security forces should also be cognizant of the potential costs to the local economy of their violence-suppressing activities.

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TABLES FOR TEXT INSERTION

Table 1: Summary Statistics for Population, Unemployment, and Violence

	Variable	Mean	Std. Dev.	Min	Max
Iraq (district/quarter)	Population (district)	605,340	464,106	10966	1,624,058
	Unemployment (rate)	.09773	.06899	0	0 .49480
	Sunni vote share (governorate)	.2068853	.2501668	0	.9169017
	Population density (1,000/km^2)	1.539937	3.173681	.0002341	13.62276
	SIGACT incidents / 1000	.2582941	.5030538	0	8.539146
	Iraq Body Count (IBC) incidents / 1000				
	Insurgent	.0048082	.0110837	0	.239976
	Sectarian	.0125934	.0254728	0	.339966
	Coalition	.0022446	.0057369	0	.139986
	IBC civilian casualties / 1000				
	Insurgent	.0181635	.0429873	0	.6112922
	Sectarian	.0485542	.1586676	0	1.703336
	Coalition	.0149975	.1030831	0	1.341513
	Insurgent precision	.9227115	.1589288	0	1
Philippines (province/year)	Population (province)	1,477,025	861,314	16,256	3,625,558
	Unemployment (rate)	.102295	.033368	0	.165
	Percent Muslim (year 2000)	.0571094	.1902553	0	.9327894
	Insurgent-initiated incidents / 1000	.0114522	.021431	0	.188992
	Civilian casualties / 1000	.0034244	.006293	0	.056977

Sources: Unemployment and population: Iraq Living Conditions Survey (ILCS) (March and April 2004), World Food Program Food Security and Vulnerability Analysis in Iraq (June and July 2005), World Food Program Food Security and Vulnerability Analysis in Iraq (November and December 2007), Republic of the Philippines Census Organization, Labor Force Survey (LFS) for 2001 through 2003. Violence: Empirical Studies of Conflict Philippine project, internal security incidents, Armed Forces of the Philippines, 2001-2003; Multi-National Forces Iraq SIGACTS III Database. Sunni vote share in Iraq is based on the December 2005 elections. Muslim population share in the Philippines is from the LFS. Iraq Body Count (IBC) data is collected from press reports. It covers only incidents in which civilians were killed. Insurgent precision is the proportion of SIGACT incidents in which IBC did not report civilian casualties (but did report targeting of Coalition or Iraqi forces).

Table 2: Unemployment and Violent Incidents in Iraq and the Philippines

		Linear Regression			
	DV	Incidents /1000	Incidents /1000	Incidents /1000	Incidents /1000
Iraq (district/quarter)	Region	All	Baghdad	All	Baghdad
	Unemployment	-1.307**	-4.593**	-1.204**	-2.684**
		(0.60)	(1.67)	(0.72)	(1.04)
	Observations	312	27	312	27
	R-squared	0.23	0.37	0.76	0.78
	Controls	Ethnicity	Ethnicity	District FE	District FE
Philippines (province/year)	Region	All	Muslim > 5%	All	Muslim > 5%
	Unemployment	-0.075*	-0.083	-0.087*	-0.471*
		(0.046)	(0.31)	(0.057)	(0.28)
	Observations	228	36	228	36
	R-squared	0.46	0.27	0.88	0.88
	Controls	Ethnicity	Ethnicity	Province FE	Province FE

Note: All regressions include time fixed effects. Standard errors in parentheses, robust standard errors clustered by district/province reported for linear regressions. *** $p < .01$, ** $p < .05$, * $p < .1$, one-tailed with $H_0 > 0$. Variables described in note to Table 1.

Table 3: Unemployment and Violent Incidents, by period

Dependent variable: SIGACT incidents

	2004-07		2004-05		2005-07	
	All	Baghdad	All	Baghdad	All	Baghdad
Unemployment	-1.41	-2.68	-1.49	-3.26	-1.54	-1.70
	(.84)**	(1.04)***	(.93)*	(1.75)**	(1.65)	(1.50)
Observations	297	27	193	18	197	18
R^2	0.76	0.78	0.77	0.75	0.87	0.91

Note: Includes year and district fixed effects. Robust standard errors clustered by district in parentheses. *** $p < .01$, ** $p < .05$, * $p < .1$, one-tailed with $H_0 > 0$. Variables described in note to Table 1.

Table 4: Unemployment and Violence in Civilian Casualties Incidents, by Perpetrator

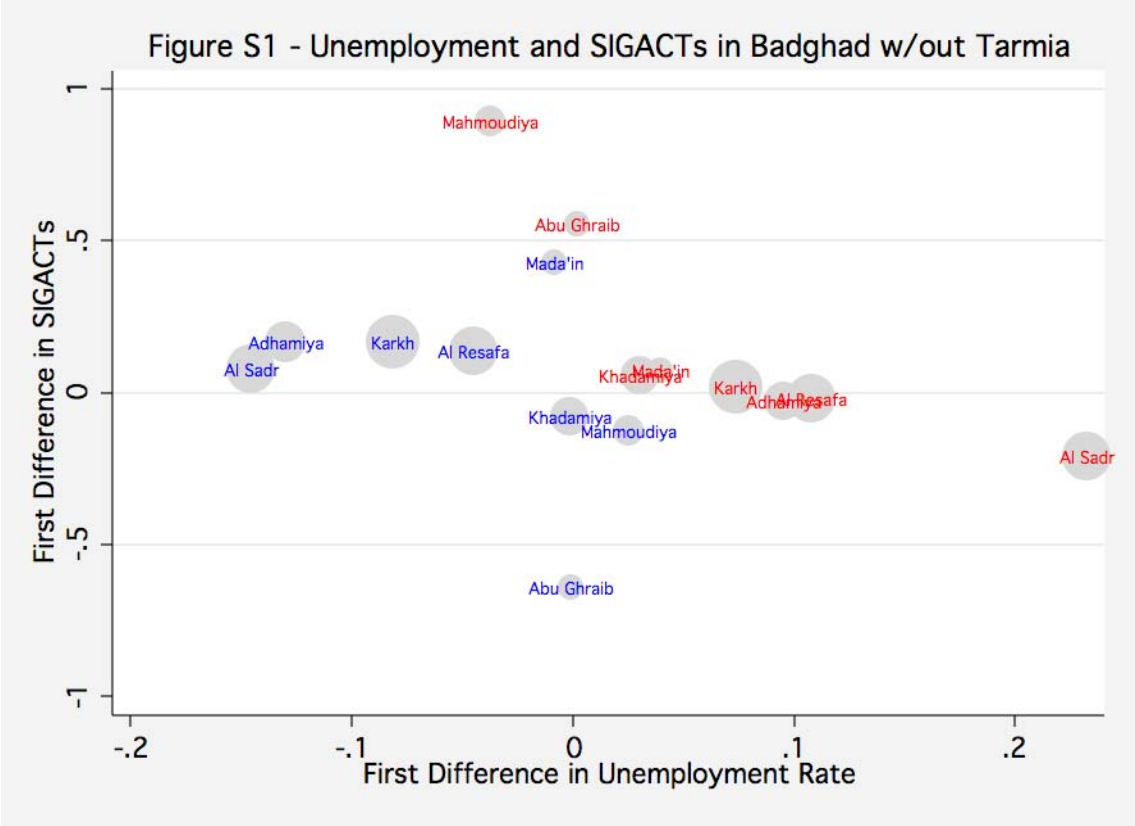
Perpetrator of Incident:	Insurgent			Sectarian			Coalition		
Dependent Variable: Civilian Casualty Incidents									
	All	Not Baghdad	Baghdad	All	Not Baghdad	Baghdad	All	Not Baghdad	Baghdad
Unemployment	.009	.008	.011	.001	-.006	-.003	-.002	-.001	-.012
	(.011)	(.013)	(.010)	(.034)	(.043)	(.026)	(.008)	(.01)	(.009)
Observations	297	270	27	297	270	27	297	270	27
R^2	0.72	0.74	0.57	0.66	0.67	0.77	0.49	0.52	0.30
Dependent Variable: Civilian Casualties									
	All	Not Baghdad	Baghdad	All	Not Baghdad	Baghdad	All	Not Baghdad	Baghdad
Unemployment	0.019	-0.052	0.249***	-0.513	-0.067	-2.109	0.081	0.158	-0.022
	(0.058)	(0.043)	(0.068)	(0.477)	(0.132)	(2.051)	(0.106)	(0.174)	(0.041)
Observations	297	270	27	297	270	27	297	270	27
R^2	0.68	0.71	0.68	0.39	0.56	0.45	0.35	0.36	0.29

Note: Iraq Body Count data. Includes year and district fixed effects. Robust standard errors clustered by district in parentheses. *** $p < .01$, ** $p < .05$, * $p < .1$, one-tailed. Variables described in note to Table 1.

Table 5: Insurgent precision, unemployment, and population density
Dependent variable: Insurgent Precision = 1 – (Insurgent-killings/SIGACTs)

	2004-07		2004-05		2005-07	
Unemployment	-0.632	-0.090	-0.771	0.050	-0.741	0.268
	(0.69)	(0.22)	(1.05)	(0.21)	(0.93)	(0.48)
Population Density		0.00438		-0.388**		-0.298***
		(0.12)		(0.18)		(0.073)
Unemp. *		-0.333**		-0.306***		-0.714***
Pop. Density		(0.14)		(0.041)		(0.078)
Observations	312	312	208	208	208	208
R^2	0.54	0.69	0.72	0.90	0.65	0.84
Joint F-Test on unemployment and interaction term		6.6***		57.18***		42.11***

Note: Includes year and district fixed effects. Robust standard errors clustered by district in parentheses. *** p < .01, ** p < .05, * p < .1, two-tailed. Variables described in note to Table 1.



First differences: 04-05 (red), 05-07(blue) (Table 3, column 2) [10]

[10] 9 districts x 3 years = 18 observations of differences.

Supporting Tables

Appendix Table S1: Unemployment and Violent Incidents in Iraq and the Philippines, Negative Binomial Regression

		Negative Binomial Regression			
	DV	Incidents	Incidents	Incidents	Incidents
Iraq (district/quarter)	Region	All	Baghdad	All	Baghdad
	Unemployment	-5.158***	-11.81***	-2.481**	-7.757***
		(1.55)	(2.26)	(1.32)	(2.28)
	Observations	312	27	279	27
	R-squared				
	Controls	Ethnicity, Population	Ethnicity, Population	District FE, Population	District FE, Population
Philippines (province/year)	Region	All	Muslim > 5%	All	Muslim > 5%
	Unemployment	-3.131*	-3.376	-6.081**	-10.70**
		(2.20)	(5.45)	(3.42)	(6.11)
	Observations	228	36	228	36
	R-squared				
	Controls	Ethnicity, Population	Ethnicity, Population	District FE, Population	District FE, Population

Note: All regressions include time fixed effects. Standard errors in parentheses. *** $p < .01$, ** $p < .05$, * $p < .1$, one-tailed with $H_0 > 0$. Variables described in note to Table 1.