American Economic Review: Papers & Proceedings 2013, 103(3): 518–522
http://dx.doi.org/10.1257/aer.103.3.518

Insurgent Compensation: Evidence from Iraq[†]

By Benjamin W. Bahney, Radha K. Iyengar, Patrick B. Johnston, Danielle F. Jung, Jacob N. Shapiro, Howard J. Shatz *

Participating in insurgency is almost always physically risky, raising questions about what motivates people to do so. Political economy theories of crime, insurgency, and rebellion posit some opportunity cost constraint so that the net value of participation must be at least as good as the next best option (Iyengar 2008; Bueno de Mesquita forthcoming). That net value may contain a nonpecuniary component, such as soothing personal grievance or gaining prestige, but it also contains monetary rewards. Sometimes these rewards are implicit: the ability, usually of middle managers, to take advantage of one's position to skim funds (Shapiro and Siegel 2007) or tax civilians and then pay low-level fighters with a share of the profits. Typically, however, the monetary rewards are explicit: Wages are paid as in other jobs. How those wages vary has implications for counterinsurgency policies and provides evidence regarding the agency problems the compensation scheme is designed to solve.

We report initial results from an examination of insurgent compensation paid during the recent war in Iraq. The war provides a unique opportunity to study this phenomenon as the US military collected a large number of insurgent financial records. Combining this information with other data allows us to analyze how compensation varied with levels of combat, economic opportunities, and other conditions that may affect decisions to participate in violence.

We analyze data on 3,799 payments to insurgents in al Qa'ida in Iraq (AQI), one of the main insurgent groups and the most extreme, across three governorates—Iraqi provincial-level subnational units—in 2006 and 2007. We find no evidence compensation was based on risk or even that it reflected the marginal product of labor. Indeed, there is modest evidence for a negative compensation-risk relationship at the governorate-year level.

I. Existing Literature

Literature relevant to our study covers (i) screening for high-quality workers, (ii) providing incentives for risky jobs, and (iii) financial behavior of militant groups. The literature on labor market screening finds that when the quality of workers is unobservable, low quality workers have an incentive to seek high-wage jobs (Akerlof 1970). Screening mechanisms include incentive schemes such as piecework (Lazear 1999), requiring costly investments in education (Spence 1981), participation in costly ritual activity (Berman 2009), and low entry-level wages (Baker, Gibbs, and Holmstrom 1994).

A large literature discusses how firms create incentives for workers to take on risky jobs through compensating wage differentials. This literature considers the wage paid to workers as a function of (i) the marginal productivity of the worker and (ii) job attributes, typically expressed through the notion of riskiness or dirtiness. Inducing workers to undertake risky or dirty jobs is thought to require a wage premium.

* Bahney: RAND Corporation, 1200 South Hayes St., Arlington, VA 22202 (e-mail: bahney@rand.org); Iyengar: RAND Corporation, 1200 South Hayes St., Arlington, VA 22202 (e-mail: riyengar@rand.org); Johnston: RAND Corporation, 1200 South Hayes St., Arlington, VA 22202 (e-mail: patrickj@rand.org); Jung: Princeton University, Princeton, NJ 08544 (e-mail: dfjung@exchange.princeton.edu); Shapiro: Princeton University, Princeton, NJ 08544 (e-mail: jns@princeton.edu); Shatz: RAND Corporation, 1200 South Hayes St., Arlington, VA 22202 (e-mail: howard_shatz@rand.org). We thank Barrett Brown, Kevin Feeney, Corey Gannon, Gabriel Koehler-Derrick, Blake Mobley, Phil Padilla, Bryan Price, Don Rassler, Patrick Ryan, Alexandria C. Smith, Robert Stewart, Barbara Sude, Chris Tucker, and Jon Welch. The authors acknowledge support from the Defense Advanced Research Projects Agency. Jung and Shapiro acknowledge support from the Air Force Office of Scientific Research (AFOSR) under Award No. FA9550-09-1-0314.

† To view additional materials, and author disclosure statement(s),visit the article page at http://dx.doi.org/10.1257/aer.103.3.518.

Empirical research has found little evidence of compensating wage differentials, perhaps because some workers place positive value on holding a risky job (Lavetti 2012).

In the crime and insurgency literature, Levitt and Venkatesh (2000) use data from a Chicago street gang to argue that compensation within urban gangs is highly skewed towards senior ranks; the prospect of future riches is the key motivation. Bahney et al. (2010), studying a small sample of insurgent documents from Iraq, find that AQI fighters were dramatically undercompensated relative to average wages in Anbar province in 2005 to 2006, suggesting the importance of ideology in motivating these fighters.

II. Data

Our compensation data come from insurgent documents contained in the US Department of Defense's Harmony Database, a collection of more than one million electronic and paper documents gathered during operations in Afghanistan, Iraq, and elsewhere. The documents include strategic policy studies, personal letters, membership lists, expense reports, and financial spreadsheets. A team at the RAND Corporation searched the database for financial documents. These were passed to the Combating Terrorism Center (CTC) at West Point, which worked with US Special Operations Command to declassify them.

This analysis focuses on AQI, a Sunni group that declared itself the Islamic State of Iraq in October 2006. We draw on 153 documents, including 21 large spreadsheets, 20 reports with a mix of narrative content and small financial tables, and 112 documents that provide context.

We extracted compensation data for 3,799 payments to at least 2,080 individuals, the number of unique names in the data, from Anbar, Diyala, and Ninewa governorates. We have a large sample of payments for Anbar in 2006 (1,065) and Ninewa in 2007 (2,157).

Thirteen of the documents list a single amount of compensation paid to each individual. The remaining nine disaggregate payments into a base rate and additional compensation for food ("groceries" or "ration card"), accommodations ("rent"), or other expenses (translated as "assistance"). In AQI's compensation scheme, salary payments continued to the families of those killed or captured. Eleven documents clearly record fighters' status, and in these only 56 percent of the payments went to active fighters.

Nearly all documents also track family structure; marital status most commonly, but also the number of children per fighter. The Mosul administrator, in Ninewa, used unique identification numbers for fighters to track them across documents, but others recorded only names, making it hard to distinguish repeated payments from those to different fighters sharing a name.

We combine the compensation data with data on conflict intensity, including combat incidents recorded in the SIGACT-III database prepared by Multi-National Force—Iraq, the military command responsible for conducting the war through the end of 2009, and civilian casualties from Iraq Body Count, which tracks civilian deaths in Iraq using press reports.[1]

III. Results

AQI followed a flat salary structure. The "Rules for Social Assistance," found in Anbar in January 2007, listed the monthly salary for a fighter as 60,000 Iraqi dinars (IQD), about $41 in nominal terms at current exchange rates. The document specified that fighters get an additional 30,000 IQD for each dependent and that wages continue if a fighter is killed or captured, providing life insurance so long as the organization remained viable.[2]

These salary levels appear to be quite low by Iraqi standards. Based on a 2004 listing of job openings in Baghdad, the following monthly salaries were described as low: $150 for an experienced bricklayer, and $50 to $100 for unskilled workers in plastic bag production, vending, and metalwork shops (Davis 2005). Furthermore, these salaries are strikingly low considering the risks AQI fighters accepted. In Anbar in 2005 and 2006, Bahney et al. found the mortality risk for AQI fighters was more than 47 times that for males aged 18–48 populationwide. Of the 1,608 payments to individuals whose status is identified, 44 percent were to "martyrs" and detainees.

[1] Condra and Shapiro (2012) describe these data in detail and provide diagnostics on their biases.

[2] The Provisional IRA made similar payments to the families of captured fighters, an expense that put the group under considerable pressure over time as salaries to prisoners' families came to consume a large portion of the organizations' budget (Glover 1978).

AQI did not follow its written guidelines to the letter. Salaries and total compensation differed by region, especially the reimbursable expenses. Of 451 people listed in four documents that distinguish clearly between salary and money for living expenses, almost all in Ninewa, roughly 53 percent of compensation was for living expenses. A series of letters seeking reimbursement for such expenses show that these payments were handled on an ad hoc basis.

The most surprising pattern in the data is how little average compensation differed by level of violence. Table 1 shows total compensation, mean and median salary, violence levels, and riskiness of insurgents' attack portfolio by governorate. Mean and median salaries are relatively constant across governorates, ranging between 93,000 and 98,000. Mean total compensation is more variable. In both cases the highest payments are in the least violent governorate (Ninewa). These rates are consistent with compensating fighters for family size. Ninewa and Diyala have slightly higher rates of married fighters compared to Anbar; however, regression analysis shows that family structure does not fully account for the difference.

The rates suggest no monetary compensation for risk. Monthly compensation per incident of violence was approximately 124 IQD in Anbar, compared to 197 IQD in Diyala and 260 IQD in Ninewa. In our sample, total compensation per attack was higher in areas with *lower* levels of overall and per capita combat violence. Indeed, there is a negative correlation between pay and combat at the governorate level after controlling for marital status and allowing a mean shift for observations that cannot be located to a specific district.

Some of the apparent homogeneity of wages may be due to aggregation to the governorate level. Trends in violence varied quite a bit across smaller geographic units (Biddle, Friedman, and Shapiro 2012), and we see some variation in pay across subunits in these data. Within identifiable subunits that had 20 or more fighters, median monthly compensation was 120,000 IQD, in line with provincial averages, but across these subunits it ranged from 50,000 to 240,000 IQD. These differences were not fully explained by family structure. The percent married ranged from 35 to 79 percent across subunits and is positively correlated with median compensation within units but accounts for only 11 percent of the variance in median total compensation.[3]

Table 1—Monthly Compensation and Violence by Governorate

Panel A. Personnel

Governorate	Mean total compensation (IQD)	Mean salary (IQD)	Median salary (IQD)	Proportion married
Anbar	126,306	93,302	90,000	0.63
Diyala	100,781	96,406	110,000	0.69
Ninewa	134,565	98,097	100,000	0.68

Panel B. Violence (*monthly means*)

Governorate	Combat incidents	Combat incidents per 100,000	Civilian casualties per 100,000	Riskiness ratio of attack portfolio
Anbar	1,017	94.5	8.3	0.499
Diyala	512	41.7	22.4	0.373
Ninewa	517	21.7	8.7	0.369

Notes: Compensation figures exclude outliers where total compensation was more than 400,000 IQD. Riskiness is defined as the proportion of attacks that are not indirect fire or improvised explosive device attacks, the two kinds that can be conducted without exposing fighters to immediate risk of counterattack.

Sources: Compensation figures from author calculations. Combat incidents and civilian casualties from Condra and Shapiro (2012).

It may be the case that different forms of violence expose fighters to greater or lesser risk, which could confound simple tabulations. We examined the conditional correlations between compensation and levels of different kinds of attacks using OLS. Controlling for marital status to account for payments to fighters with families and using governorate and year fixed effects to account for variation in counterinsurgent efforts and the preferences of the population, salary is negatively correlated with total, direct fire, indirect fire, and improvised explosive device attacks per 100,000 people. An additional 10 total attacks correlates with a 0.07 percent decrease in wages. Bivariate and conditional correlations between indirect fire attacks and salary are negative—consistent with groups choosing a low risk–low salary mix in

[3] For the 52 subunits where the number of children was recorded, the median percent married and number of children in that subunit accounted for 13 percent of the variance in median total compensation. See the online Appendix for further details.

some areas (such attacks can be conducted from afar and for skilled fighters have low risk of both injury and detection)—but bivariate and conditional correlations between direct fire attacks (the most risky to the attacker) and salary are also negative, suggesting the opposite.

IV. Conclusions

In a typical labor market, compensation rewards employees for what they do for the firm. In the case of insurgent groups, this would entail compensation for risks taken on behalf of the group as well as productivity and would lead one to expect that fighters operating in places with more combat would receive higher wages. That was manifestly not the case for AQI. So how should we understand the observed wage structure?

One possibility is that AQI used wages as a screening mechanism in an environment where uncommitted individuals posed security risks for the group and there was a glut of willing fighters. For wages to screen effectively while still allowing the group to operate, AQI would have to set them high enough that members could survive and support their families if they joined, but low enough that only sufficiently committed individuals would accept. That members were expected to bear some expenses in hopes of getting reimbursed may also have served a managerial purpose: if operatives performed poorly reimbursements could be withheld. The marginal increase in wages for being married and having children make sense as a way of embedding the group in local communities, consistent with a view of insurgency as a form of armed state-building (Johnston 2008).

This still leaves the puzzle of payments to the families of killed and captured members. For AQI these guaranteed that legacy costs would rise inexorably over time. Perhaps such payments served to buttress low salaries by providing implicit life insurance, although it seems unlikely that the organization's guarantee of lifetime payments would be completely credible given the range of groups competing for power. An alternative is that AQI leaders needed to signal something about their type to potential operatives. These payments could serve to build member loyalty and trust by showing that leaders were willing to spend resources on fighters' families instead of allocating those resources to attacks.

Our results raise two further questions. First, how did AQI retain Iraqi talent in the presence of competing insurgent groups when it paid such low wages? We can only speculate: talented people may have expected rapid promotion or might have placed a high value on life insurance; AQI's ideology and organizational strengths might have made it the best jihadi organization, regardless of salary levels; or AQI might have enforced a no-exit policy for Iraqis (although Felter and Fishman 2007 show that foreign fighters could go home).

Second, and more importantly, if insurgents are not paid market wages, then how should we think about opportunity cost constraints? Such constraints are critical in almost all economic models of conflict, but compensation practices by the most prominent insurgent group in the Iraq war suggest they were not critical. That puzzle merits further research.

REFERENCES

Akerlof, George A. 1970. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism." *Quarterly Journal of Economics* 84 (3): 488–500.

Bahney, Benjamin, Howard J. Shatz, Carroll Ganier, Renny McPherson, and Barbara Sude. 2010. *An Economic Analysis of the Financial Records of al-Qa'ida in Iraq.* Santa Monica: RAND Corporation.

Baker, George, Michael Gibbs, and Bengt Holmstrom. 1994. "The Internal Economics of the Firm: Evidence from Personnel Data." *Quarterly Journal of Economics* 109 (4): 881–919.

Berman, Eli. 2009. *Radical, Religious, and Violent: The New Economics of Terrorism*. Cambridge, MA: MIT Press.

Biddle, Stephen, Jeffrey A. Friedman, and Jacob N. Shapiro. 2012. "Testing the Surge: Why Did Violence Decline in Iraq in 2007?" *International Security* 37 (1):7–40.

Bueno de Mesquita, Ethan. Forthcoming. "Rebel Tactics." *Journal of Political Economy*.

Condra, Luke N., and Jacob N. Shapiro. 2012. "Who Takes the Blame?" *American Journal of Political Science* 56 (1):167–87.

Davis, Craig. 2005. "Reinserting Labor into the Iraqi Ministry of Labor and Social Affairs." *Monthly Labor Review* 128 (6): 53–61.

Felter, Joseph H., and Brian Fishman. 2007. *Al-Qa'ida's Foreign Fighters in Iraq*. West Point: Combating Terrorism Center.

Glover, James M. 1978. *Northern Ireland: Future Terrorist Trends*. London, UK: Ministry of Defense.

Iyengar, Radha. 2008. "I'd Rather be Hanged for a Sheep than a Lamb: The Unintended Consequences of 'Three-Strikes' Laws." National Bureau of Economic Research Working Paper 13784.

Johnston, Patrick. 2008. "The Geography of Insurgent Organization and its Consequences for Civil Wars: Evidence from Liberia and Sierra Leone." *Security Studies* 17 (1): 107–37.

Lavetti, Kurt. 2012. "The Estimation of Compensating Differentials and Preferences for Occupational Fatality Risk." Unpublished.

Lazear, Edward P. 1999. "Personnel Economics: Past Lessons and Future Directions: Presidential Address to the Society of Labor Economists, San Francisco, May 1, 1998." *Journal of Labor Economics* 17 (2): 199–236.

Levitt, Steven D., and Sudhir Alladi Venkatesh. 2000. "An Economic Analysis of a Drug-Selling Gang's Finances." *Quarterly Journal of Economics* 115 (3): 755–89.

Shapiro, Jacob N., and David A. Siegel. 2007. "Underfunding in Terrorist Organizations." *International Studies Quarterly* 51 (2): 405–29.

Spence, Michael. 1981 "Signaling, Screening, and Information." In *Studies in Labor Markets*, edited by Sherwin Rosen, 319–58. Chicago: University of Chicago Press.