

Quiz #6 (Answer Key)  
 ECNS 491  
 Spring 2018

Name \_\_\_\_\_

**1.) (5 points)** There are two armies. One is strong and the other is weak. Each can play one of two strategies: “attack” or “don’t attack”. If the strong army plays “attack” it will always get a payoff of +G. If the strong army plays “don’t attack”, then it will get a payoff of -S when the weak army plays “attack”. If the weak army plays “attack” when the strong army plays “attack” then it gets a payoff of -G. If the weak army plays “don’t attack” when the strong army plays “attack” then it gets -S. If the weak army plays “attack” when the strong army plays “don’t attack” then it gets a payoff of +S. If both armies play “don’t attack” at the same time then each get zero. Assume that  $G > S > 0$ .

Draw the 2x2 box representing each army’s strategies and the accompanying payoffs. Solve for the Nash Equilibrium of this game.

		Weak Army	
		Attack	Don’t Attack
Strong Army	Attack	<b>G, -G</b>	<b>G, -S</b>
	Don’t Attack	<b>-S, S</b>	<b>0, 0</b>

Nash equilibrium is for the strong army to play “attack” and the weak army to play “don’t attack.”

**2.) a.) (5 points)** Using a supply and demand analysis for the market for gun-related crime, illustrate graphically why the effects on crime are theoretically ambiguous in the presence of an exogenous decrease in the stock of guns. For simplicity, go ahead and assume that the probability of conviction,  $p_c$ , remains constant.

A decrease in the stock of guns will cause the supply curve for crime to shift inward and the demand curve for crime to shift outward...and, thus, the effects on the equilibrium level of offending are ambiguous.

**b.) (5 points)** From an empirical perspective, provide two reasons why the relationship between guns and crime is endogenous. Be brief in your explanation and only use the space provided below.

i.) Reverse causality: the level of crime can have an effect on the stock of guns

ii.) Omitted variable bias: an unobserved factor (e.g., income levels) could simultaneously determine the level of crime and the stock of guns.