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The Two Sides of Economic and Democratic Change: An Economic Model of Terrorism & Insurgency

By First Lt. John A. Sautter, USMC¹

A formal microeconomic model of terrorism is utilized to understand acts of political violence in a domestic context within the domain of democratic governance. The model is then interpreted with terrorism as an inferior economic good to discuss how the timing of government decisions to negotiate with terrorists/insurgents can affect the likelihood of success in combating political violence. This article then analyzes this theoretical concept within various insurgent cases. Finally, a mathematical appendix is offered to show how the model operates.

¹John A. Sautter is a First Lieutenant in the United States Marine Corps and a law student at Vermont Law School in South Royalton, VT. Lieutenant Sautter received his B.A. from New York University, and completed his M.A. in history and a Ph.D. in political science at the University of Nebraska. E-mail: jas276@nyu.edu Address: John A. Sautter, P.O. Box 972, South Royalton, VT 05068

INTRODUCTION

A major focus in the area of counter-terrorism policy, especially since September 11, 2001, has been on transnational violence. However, whether one views this topic historically or in the contemporary context, both of these areas operate in a smaller role than one would think. An examination of the ITERATE (International Terrorism: Attributes of Terrorist Events) collection of acts of terrorism during the past thirty years shows a majority of incidents were neither international in scope nor initiated by religiously motivated groups.² Furthermore, analysis shows that a majority of terrorist acts over this period were caused by individuals indigenous to the state in which they occurred, with the victims being largely from those states as well. Domestic terrorism and, or, its particular motivations are equally as important as the transnational case. Indeed, domestic terrorism can be a part of a larger and sustained “insurgency.” The two main goals of this article are, first, to use economic concepts to explain a theoretical model explaining domestic terrorism in the context of economic and democratic development. And, second, to interpret the theoretical model by drawing upon comparative examples of insurgent and terrorist activity.

DEVELOPMENT AND TERRORISM

Democratic and economic motivational interpretations of terrorism (as opposed to purely economic theoretical interpretations) have recently begun to find salience. The positive relationship between growth in democratic rights and economic development has long been established by political economy scholars.³ Recent empirical findings suggest

² Edward F. Mickolus, Todd Sandler, Jean M. Murdock, and Peter A. Flemming. 2006. International Terrorism: Attributes of Terrorist Events, 1968-2002 INTERNATIONAL TERRORISM: ATTRIBUTES OF TERRORIST EVENTS, 1968-2002. Dunn Loring, VA: Vinyard Software.

³ Seymour Lipset. 1959. “Some Social Requisites of Democracy: Economic

that terrorism and insurgent activity is a negative correlate of both.⁴ One study of 119 countries over a 22 year period found that as governmental institutional obstruction to democratic expression decreases, so do incidences of terrorism. In fact, in eight out of the ten regression models that the study used in the analysis, an increase in gross domestic product per capita is also found to be a significant predictor of lower incidences of terrorism.⁵ An earlier examination of terrorism found that there is a strong connection between the ebb and flow of economic growth and incidences of terrorism: When economic growth is high, terrorism tends to subside.⁶ These conclusions suggest that theoretical models need to account for the manner in which democratic and economic changes might alter the preferences of an individual contemplating a violent political act.

The model presented herein is used to conduct an analysis of how changes in democratic and economic cause “substitution effects,” where citizens replace peaceful political participation with violence. In economics a substitution effect is a consequence of a change in the price of a good or service. By looking at the substitution effect that comes with changing the “price” of legal political participation- i.e. making participation more difficult- it is theorized that governments will be more successful in curbing violent acts with concessions or political recognition when democratic expression and economic growth is high than when it is low.⁷ In this case, citizens are seen as consuming political goods, whether it be through legal political participation or through illegal political

Development and Political Legitimacy.” *The American Political Science Review* 53: 69-105.

⁴ Quan Li. 2005. Does Democracy Promote or Reduce Transnational Terrorist Incidents? *Journal of Conflict Resolution* 49: 278-297.

⁵ *Id.*

⁶ Brock Blomberg, Gregory D. Hess, and Akila Weerapana. 2002. Terrorism From Within: An Economic Model of Terrorism. *Claremont Colleges Working Papers in Economics*.

⁷ The conceptualization of “legal” versus “illegal” political goods as used here, in the context of terrorism/insurgency, is taken from Todd Sandler, John T. Tschirhart, and Jon Cauley. 1983. A Theoretical Analysis of Transnational Terrorism. *The American Political Science Review* 77: 36-54.

violence. Indeed, the forthcoming analysis suggests that acts of political violence may even be increased by altering the cost of legal participation in government depending on the relative state of a nation's democratic and economic development. This issue is also defined in a new way by viewing it within the context of terrorism as an "inferior democratic good," or a good that loses salience as more democratic and economic rights are assumed by a country's populous.

TERRORISM AS AN INFERIOR GOOD

Terrorism should be viewed as an inferior good in a democratic/economic development context. An inferior good is traditionally understood to be a product or service that is consumed in large quantities when income is low. However, as income increases individuals tend to consume less of an inferior good. A very simple example might be macaroni and cheese. One could argue that as my income increases I would want to consume less macaroni and more of other healthier foods that I can now afford. Evidence shows that terrorism or violent acts of insurgents are the same. Comparative analyses of terrorist and insurgent activities have demonstrated that over time as income per capita increases and democratic reforms are implemented, violent acts tend to wane.⁸

As is shown in Figure 1, demand for violence decreases as a citizen's democratic expression and economic income increases. Central to this theoretical interpretation is that there is some point E' on the democratic/economic development expansion path that after which, as development increases, the desire for illegal political acts will decrease. Furthermore, this graph suggests that there is a limit, S*, to the amount of illegal acts a populous will desire before their preference for political participation changes, hence, up

⁸ Brock Blomberg, Gregory Hess, and Akila Weerapana, 2002; Quan Li, 2005.

until the turning point E' , violent acts increase in relation to m , or democratic/economic development. This has broad theoretical implication in terms of when a government should attempt to negotiate with terrorists and insurgent groups. If a nation's citizens are enjoying the fruits of democratic and economic development this concept suggests that they would be less likely to condone or participate in violent acts against the government.

{Insert Figure 1 Here}

In many respects the E' that is proposed in this article is analogous to the tipping point that has been referred to during the current American-Coalition occupation in Iraq. By building up infrastructure, opening schools and attempting to revitalize the Iraqi economy, the Coalition is attempting to breach the theoretical point E' . The problem that Coalition forces are having though is much the same as this idea would suggest. The more money injected into the country coupled with the higher amounts of political freedom people are now allowed to exercise has only exacerbated the violent insurgency that has been rampant since the fall of the Hussein regime. Indeed, by allowing individuals such as Moktadar al Sadr, and various other Sunni or Shiite sectarians, to participate in government elections will not necessarily decrease their willingness to commit or support acts of political violence because their preference for these activities is still very high. For the Coalition the challenge is to push past the threshold E' , thereby altering the preferences of those opposing the occupational authority and the new Iraqi government.

THE PRICE OF POLITICAL PARTICIPATION:

Understanding political violence as an inferior good in the context of democratic/economic development allows us to view a populous' preferences as

changing with reform. In this new case we can now look at a citizen's political utility and preference for illegal political acts, versus legal political acts (participation in government, voting, distributing political-flyers, etcetera) in relation to government attempts to bring terrorists and insurgent groups into the political process by lowering the costs that would be incurred by consuming legal political goods. The following analysis explains this theoretical change in consumption of illegal and legal "political" goods without going into a deep discussion of the mathematics involved in the formal economic model. However, the appendix explains the substitution and income effects associated with citizens altering their political activities.

The first scenario is a decrease in the price of political participation when democratic and economic development is low, or $E' > m$. In this case a government may attempt to quell political violence by legitimizing the organization or allowing the terrorist group to participate in the political process. Those who support terrorists (or likely who have committed political violence) will take the opportunity to participate in government. However, since the nation's citizens' preference structure still contains a desire for violence, because of the level of democratic expression and economic development, these individuals will still continue to commit and/or support acts of political violence.

The Palestinian-Israeli example is a clear parallel. Though the process of recognition began in 1988, it was not until 1993 that Yasser Arafat officially announced that the Palestine Liberation Organization (PLO) accepted the right of Israel to exist and renounced the use of terrorism. Under Yitzak Rabin, the Israeli government then began open-negotiations by formally recognizing the PLO as a legitimate and legal

organization. By taking steps to legitimize the PLO, Rabin inherently lowered the cost of political participation for the Palestinians. After this recognition, however, Palestinian violence did not stop. Though the PLO was engaged in political dialogue with Israel and the United States, it still maintained a modicum of violent operations under the auspices of such organizations as the Al Aqsa Martyr's Brigade. Indeed, some former members of the PLO joined groups like Hamas, which remains to this day an adamant user of terrorism. By looking at Figure 2, one can see that a supporter of terrorism reaches a higher utility level by doing as the Palestinians did: supporting participation in government and committing resources to acts of terrorism.

{Insert Figure 2 Here}

The next scenario is when the government increases the price of political participation when $E' > m$. It should be noted that this case has the same outcome as when $m > E'$ and the government increases the price of political participation. In both cases the higher cost would lower the total utility of a population that supports terrorism. However, it also increases the amount of resources allocated to illegal acts, like the situation shown in Figure 3. An increase in the total cost of participating in government elections or negotiations would make dissidents withdraw from legal forms of political disobedience. Essentially, political dissidents will be able to get a higher marginal benefit per act of illegal political violence than they would otherwise garner through legal political participation.

{Insert Figure 3 Here}

The Palestinian-Israeli case applies here as well. Though the Second Intifada began after Sharon's visit to the Haram al Sharif in September of 2000, most scholars

agree that the uprising was the result of political maneuverings by the Likud led Israeli government in an attempt to undermine the Palestinian Authority and distance itself from Arafat during the Second Camp David Summit during the summer of 2000. This situation was exacerbated by the high unemployment and the weak economy in the West Bank and the Gaza Strip.⁹

To further illustrate this scenario it is instructive to visit the case of Nicaragua. The Sandinistas commenced a campaign of terror and violent opposition to the government in 1974 after the Somoza regime intensified a policy of repressing political opposition, making it virtually impossible for the discontented majority to participate in the government.¹⁰ The Sandinistas were reviled for their kidnappings, car-bombings and hit and run attacks.¹¹ After a six-year campaign, the Sandinistas eventually were part of a wider coalition with the business community and the Roman Catholic Church that brought about the end of the Somoza family's dictatorial rule of the country in 1979.

The Nicaraguan situation was characterized by a rolling back of political rights and economic stagnation, and would therefore epitomize the $E^* > m$ case, where democratic expression and economic development are below a threshold indicating a populous has a strong preference for supporting political violence. In both this case and the Palestinian-Israeli example, terrorist incidences occurred as the result of increases in the cost of political participation. When the marginal effectiveness of one political

⁹ Rema Hammami and Salim Tamari. 2001. The Second Uprising: End or New Beginning? *Journal of Palestine Studies* 30:5-25.

¹⁰ Roger Miranda and William Ratliff. 1993. *The Civil War in Nicaragua: Inside the Sandinistas*. New Brunswick, NJ: Transaction Publishers.

¹¹ Carlos Caballero Jurado and Nigel Thomas. 1990. *Central American Wars: 1959-1989*. New York: Osprey Publishing.

strategy is diminished, the allocation of resources to the other then becomes a rational move in order to further the specific political goal.

The final, and arguably the most interesting, state of the world is when the government lowers the price of political participation when $m > E'$. In this case those that support political violence would prefer legal participation to illegal acts. Individuals who support or commit violence would garner a higher utility level by increasing their participation in government as shown in Figure 4. Sinn Fein in Northern Ireland is illustrative of the compelling effects of decreased costs in political participation shown here. The 1990's witnessed the rise of the Celtic-Tiger as Ireland began to distance itself from the UK and align more closely with the European Union.¹² The Good Friday Accords encapsulate the principle explicated here that a decrease in the cost of political participation will decrease violence under the right conditions. Among the things agreed to under the Good Friday Accords was a shared parliamentary process that included both Catholic and Protestant Nationalists. On both sides Adams, President of Sinn Fein, and Paisley, leader of the Ulster-Unionists, gave their blessings to the agreement, which essentially gave Sinn Fein more political power in Northern Ireland state political process.¹³

{Insert Figure 4 Here}

The matrix in Figure 5, showing the different outcomes of substitution effects, drives home the point that the best time for governments to negotiate with terrorists/insurgents is when democratic/economic development is high. Otherwise, a policy of non-negotiation or too much negotiation may have undesired consequences.

¹² Jonathan Stevenson. 1998. Peace in Northern Ireland: Why Now? Foreign Policy 112: 41-54.

¹³ *Id.*

{Insert Figure 5 Here}

CONCLUSION

Terrorism and insurgency, both pose a major threat to peace and security in the modern world. They must be met with thoughtful and forward looking policies that reflect the primary dynamics that underlie motivations for political violence. By modeling the change in preferences as a relation to democratic and economic development, better policy alternatives can be considered by governments faced with political violence. The primary lesson that may be taken from this theoretical analysis is that, ironically, the best time to deal with terrorists is the moment when it may be less apparent that action is needed. When income is high and individuals are content, indeed it is easier to allow terrorists/insurgents into political participation without threatening the stability of government.

Mathematical Appendix

Proof of the Substitution Effect:

Terrorist Utility and the Slutsky Equation

$$\begin{aligned} \mathbf{Max} \quad U^T &= T(L(P_L, P_I, M), I(P_L, P_I, M)) \\ \text{s.t.} \quad M &= P_L L + P_I I \end{aligned}$$

The LaGrange multiplier will be used as a means of optimizing the problem:

$$\mathfrak{S} = T(L(P_L, P_I, M), I(P_L, P_I, M)) - \lambda(P_L L + P_I I - M)$$

$$\frac{\partial \mathfrak{S}}{\partial \lambda} = P_L L(P_L, P_I, M) + P_I I(P_L, P_I, M) - M \equiv 0$$

$$\frac{\partial \mathfrak{S}}{\partial L} = \frac{\partial T(L(P_L, P_I, M), I(P_L, P_I, M))}{\partial L} - \lambda P_L \equiv 0$$

$$\frac{\partial \mathfrak{S}}{\partial I} = \frac{\partial T(L(P_L, P_I, M), I(P_L, P_I, M))}{\partial I} - \lambda P_I \equiv 0$$

Next, in order to develop the Slutsky equation, we must differentiate with respect to P_L , the price of the legal good that is going to be changed. The series of second order conditions is then put into matrix form:

$$\begin{bmatrix} 0 & -P_L & -P_I \\ -P_L & T_{11} & T_{12} \\ -P_I & T_{21} & T_{22} \end{bmatrix} \cdot \begin{pmatrix} \frac{\partial \lambda}{\partial P_L} \\ \frac{\partial L}{\partial P_L} \\ \frac{\partial I}{\partial P_L} \end{pmatrix} = \begin{bmatrix} L \\ \lambda \\ 0 \end{bmatrix}$$

We can now use cramer's rule to solve for $\frac{\partial L}{\partial P_L}$, thus:

$$\frac{\partial L}{\partial P_L} = \frac{\begin{vmatrix} 0 & L & -P_I \\ -P_L & \lambda & T_{12} \\ -P_I & 0 & T_{22} \end{vmatrix}}{H}$$

Where $H > 0$ is the sign of the determinant of the original bordered Hessian matrix.

Expanding the determinant by co-factors on the second column gives the following:

$$\frac{\partial L}{\partial P_L} = \lambda \frac{\begin{vmatrix} 0 & -P_I \\ -P_I & T_{22} \end{vmatrix}}{H} - L \frac{\begin{vmatrix} -P_L & T_{12} \\ -P_I & T_{22} \end{vmatrix}}{H}$$

This equation begins to reflect the Slutsky equation that will help to explain changes in the prices of legal goods.

Now, to account for the income effect:

$$\begin{bmatrix} 0 & -P_L & -P_I \\ -P_L & T_{11} & T_{12} \\ -P_I & T_{21} & T_{22} \end{bmatrix} \cdot \begin{pmatrix} \frac{\partial \lambda}{\partial M} \\ \frac{\partial M}{\partial P_L} \\ \frac{\partial M}{\partial P_I} \\ \frac{\partial M}{\partial M} \end{pmatrix} = \begin{bmatrix} -1 \\ 0 \\ 0 \end{bmatrix}$$

Therefore, by Cramer's Rule;

$$\frac{\partial L}{\partial M} = \frac{\begin{vmatrix} -P_L & T_{12} \\ -P_I & T_{22} \end{vmatrix}}{H}$$

Where $H > 0$, by the bordered Hessian of the SOC's assumed in maximization conditions. Therefore, we can now substitute into the $\frac{\partial L}{\partial P_L}$ equation, the income change with a change in legal good consumption:

$$\frac{\partial L}{\partial P_L} = \lambda \frac{\begin{vmatrix} 0 & -P_I \\ -P_I & T_{22} \end{vmatrix}}{H} - L \frac{\partial L}{\partial M}$$

(Substitution Effect) (Income Effect)

In order to calculate the substitution effect we need to set up the expenditure minimization problem and solve for $\frac{\partial h}{\partial P_L}$, where “h” is the compensated (Hicksian) demand curve that is not directly observable in the political goods space because it depends on direct utility.

Therefore, solving the minimization problem for the substitution effect:

$$\mathbf{Min} \quad P_L L + P_I I = M$$

$$\text{s.t. } U^T = T(L(P_L, P_I, U^T), I(P_L, P_I, U^T))$$

$$\phi(\lambda, L, I) = P_L L + P_I I - \lambda(T(L(P_L, P_I, M), I(P_L, P_I, M)) - U^T)$$

$$\text{I.} \quad \frac{\partial \phi}{\partial \lambda} = T(L(P_L, P_I, M), I(P_L, P_I, M)) - U^T \equiv 0,$$

$$\text{Therefore,} \quad T(L(P_L, P_I, M), I(P_L, P_I, M)) = U^T$$

$$\text{II.} \quad \frac{\partial \phi}{\partial L} = P_L - \lambda \frac{\partial T(L(P_L, P_I, M), I(P_L, P_I, M))}{\partial L} \equiv 0,$$

$$\text{Therefore,} \quad \lambda \frac{\partial T(L(P_L, P_I, M), I(P_L, P_I, M))}{\partial L} = P_L$$

$$\text{III.} \quad \frac{\partial \phi}{\partial I} = P_I - \lambda \frac{\partial T(L(P_L, P_I, M), I(P_L, P_I, M))}{\partial I} \equiv 0,$$

$$\text{Therefore,} \quad \lambda \frac{\partial T(L(P_L, P_I, M), I(P_L, P_I, M))}{\partial I} = P_I$$

Now, we can use these FOCs to solve for the substitution term in the slutzky equation; however, first we need to take the SOCs of these first three equations, as in a cost minimization situation. The FOCs are identities and cross price effects must be equal with a symmetrical condition as per Young’s theorem. Taking the second

derivative of these equations with respect to P_L gives the following (where the terms have been dropped for simplification):

$$\text{I.} \quad \frac{\partial T}{\partial L} \cdot \frac{\partial T}{\partial L} + \frac{\partial T}{\partial I} \cdot \frac{\partial I}{\partial P_L} \equiv 0$$

$$\text{II.} \quad 1 - \lambda \left[\frac{\partial^2 T}{\partial L^2} \cdot \frac{\partial L}{\partial P_L} + \frac{\partial^2 T}{\partial L \partial I} \cdot \frac{\partial I}{\partial P_L} \right] - \frac{\partial T}{\partial L} \cdot \frac{\partial \lambda}{\partial P_L} \equiv 0$$

$$\text{III.} \quad -\lambda \left[\frac{\partial^2 T}{\partial L \partial I} \cdot \frac{\partial L}{\partial P_L} + \frac{\partial^2 T}{\partial I^2} \cdot \frac{\partial I}{\partial P_L} \right] - \frac{\partial T}{\partial I} \cdot \frac{\partial \lambda}{\partial P_L} \equiv 0$$

Rearranging these equations into matrix form:

$$\begin{bmatrix} 0 & -P_L & -P_I \\ -P_L & -\lambda T_{11} & -\lambda T_{12} \\ -P_I & -\lambda T_{21} & -\lambda T_{22} \end{bmatrix} \cdot \begin{pmatrix} \frac{\partial \lambda}{\partial P_L} \\ \frac{\partial L}{\partial P_L} \\ \frac{\partial I}{\partial P_L} \end{pmatrix} = \begin{bmatrix} 0 \\ -1 \\ 0 \end{bmatrix}$$

Using Cramer's Rule to solve for $\frac{\partial L}{\partial P_L}$,

$$\frac{\partial L(P_L, P_I, U^T)}{\partial P_L} = \frac{\begin{vmatrix} 0 & 0 & -P_I \\ -P_L & -1 & -\lambda T_{12} \\ -P_I & 0 & -\lambda T_{22} \end{vmatrix}}{\begin{vmatrix} 0 & -P_L & -P_I \\ -P_L & -\lambda T_{11} & -\lambda T_{12} \\ -P_I & -\lambda T_{21} & -\lambda T_{22} \end{vmatrix}}$$

Now, using the Hessian matrix above, and by taking the determinate of the upper matrix,

we can sign expression $\frac{\partial L(P_L, P_I, U^T)}{\partial P_L}$, determining the slope of the conditional factor

demand curve. Since,

$$\frac{\partial h_L}{\partial P_L} \equiv \frac{\partial L(P_L, P_I, U^T)}{\partial P_L} \equiv \frac{P_I^2}{|H|}, \text{ where } \frac{P_I^2}{|H|} < 0 \text{ since we know that } |H| < 0 \text{ by the}$$

conditions imposed as a result of the minimization problem. Thus, we can determine that the conditional factor demand curve slopes downward. This gives us the Slutsky equation for terrorism:

$$\frac{\partial L(P_L, P_I, M)}{\partial P_L} = \frac{\partial L(P_L, P_I, U^T)}{\partial P_L} - \frac{\partial L(P_L, P_I, M)}{\partial M} \cdot L(P_L, P_I, M)$$

(Total Effect) (Substitution Effect) (Income Effect)

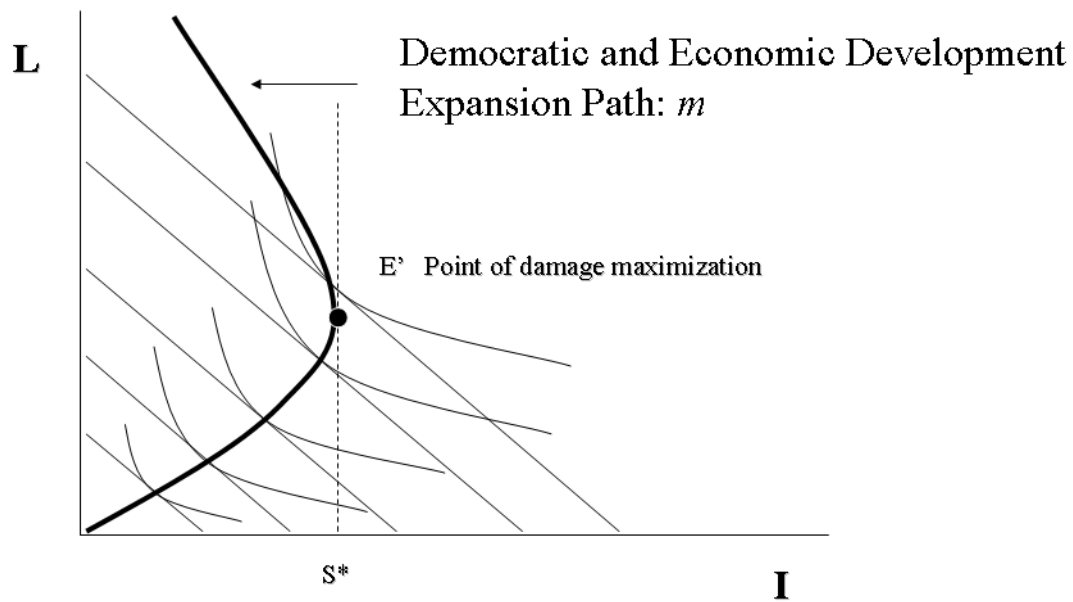
By rearranging the equation we can then see that the compensated demand curve, or the demand for legal goods with respect to a change in price is then dependent on the income effect plus or minus the Total effect. Thus,

$$\frac{\partial L(P_L, P_I, U^T)}{\partial P_L} = \frac{\partial h_L}{\partial P_L} = \frac{\partial L(P_L, P_I, M)}{\partial P_L} + \frac{\partial L(P_L, P_I, M)}{\partial M} \cdot L(P_L, P_I, M)$$

(Substitution Effect) (Total Effect) (Income Effect)

However, since we know that terrorism is an inferior good the income effect becomes the important component of the equation. If the price of the legal good is increased, then it is expected that $\frac{\partial L(P_L, P_I, M)}{\partial M} \cdot L(P_L, P_I, M)$, or the income effect will be negative, thus

lowering the amount of the legal good being consumed. On the other hand, if $M > E$, or economic income has surpassed the threshold where terrorists' preference for violence has been altered, we can surmise that the substitution effect for a decrease in price of legal political participation will increase the legal good while decreasing the demand for the illegal good, thus lowering the consumption of terrorist acts by terrorists.



Terrorism as an Inferior Good

Figure 1 Terrorism as an inferior good. I (illegal goods) and L (legal goods). “E” is a theoretical point on the democratic/economic development expansion path that after which, as development increases, the desire for illegal political acts will decrease. “S*” is the theoretical amount of illegal acts a populous will desire before their preference for political participation changes. “m” is the expansion path representing the cumulative development of democratic and economic prosperity. In this model of terrorism, as “m” approaches “S*” the preferences of a populous change from desiring illegal political acts to legal political acts.

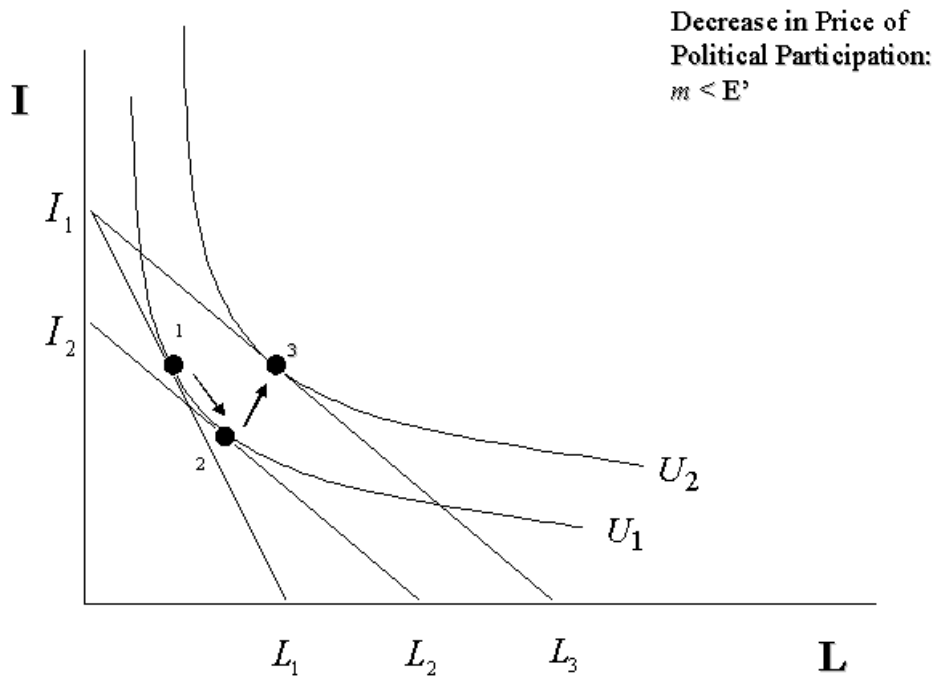


Figure 2 The substitution effect and the income effect with a decrease in the price of a legal good during a period of low economic income. Position one to position two is the substitution effect. Position two to position three is the income effect; where I is illegal and L is legal political goods.

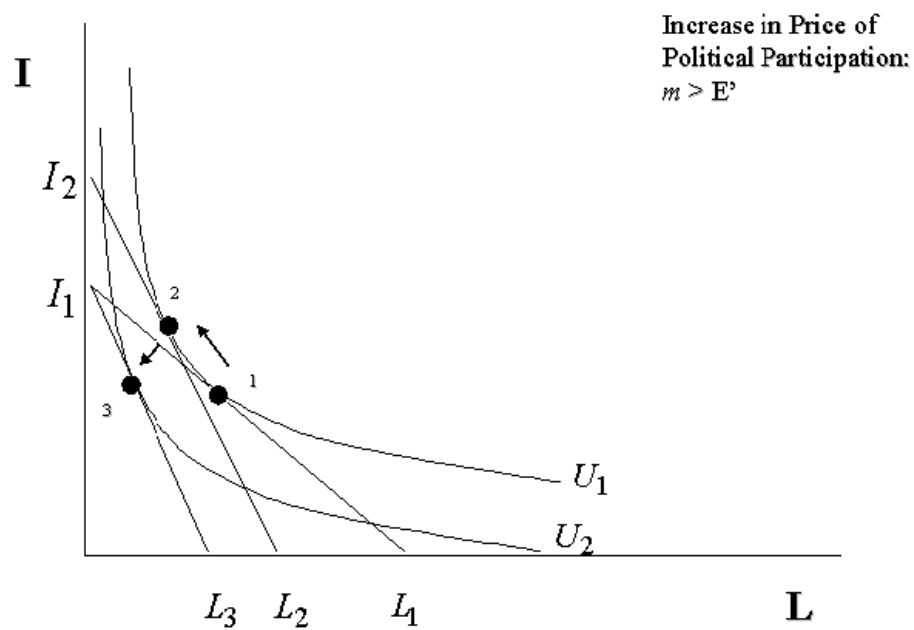


Figure 3 The substitution and income effect with a increase in the price of a legal good during a period of high economic income. Position one to position two is the substitution effect. Position two to position three is the income effect; Where I is illegal and L is legal political goods.

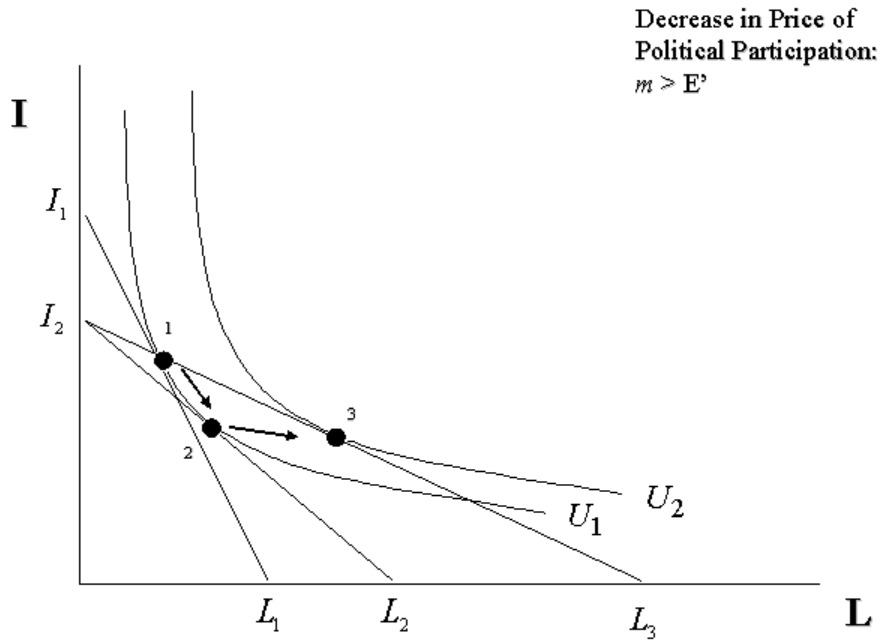


Figure 4 The substitution effect and the income effect with a decrease in the price of a legal good during a period of high economic income. Position one to position two is the substitution effect. Position two to position three is the income effect; where I is illegal and L is legal political goods.

Substitution Effects

Price of Legal Good

Democratic/
Economic
Development

Low
 $E' > m$

High
 $m > E'$

	Decrease	Increase
Low $E' > m$	Increases Terrorism and increases Political Participation	Increases Terrorism and decreases Political Participation
High $m > E'$	Decreases Terrorism and increases Political Participation	Increases Terrorism and decreases Political Participation

Figure 5 Matrix of Substitution Effects.