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MARIA DEL PILAR CASTILLO VALENCIA

ECONOMICS THEORY OF POLITICAL KIDNAPPING: THEORY AND EVIDENCY FOR THE CASE OF THE FARC IN COLOMBIA

Porto Alegre

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Tese submetida ao Programa de Pós Graduação em Economia da Faculdade de Ciências Econômicas da UFRGS, como requisito parcial para obtenção do título de Doutora em Economia, com ênfase em Economia Aplicada.

Orientador: Prof. Dr. Giácomo Balbinotto Neto

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A Nico
En memoria de mi mamá, mayo 21, 2014

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A tese não é só o resultado de um trabalho conjunto entre o aluno e seu orientador, mas também a interação através do tempo com outras pessoas e instituições que permitem o desenvolvimento de ideias, que contribuem com críticas, comentários e dão um espaço propício para o pensamento e a conclusão de um trabalho. Aqui presto uma pequena homenagem a todos os que participaram ativamente para que eu alcançasse o ponto em que me encontro hoje.

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RESUMO

O objetivo desta tese é explicar a redução nas taxas de sequestros políticos na Colômbia nos últimos anos a partir da análise do comportamento estratégico dos criminosos. Pontos de vista convencionais explicam a diminuição dos sequestros como o resultado exitoso da política de segurança democrática do presidente Álvaro Uribe Vélez. No entanto, até agora, tem sido desconsiderada a busca de explicações alternativas à já existente, que bem poderiam ser encontradas a partir da perspectiva de análise dos dilemas organizacionais produzidos pelos sequestros nas FARC – Forças Armadas Revolucionárias da Colômbia –, da sua interação estratégica com o governo e, em particular, de seus efeitos sobre sua atividade global e na decisão de pôr fim a essa ação criminosa. O interesse dos três ensaios que compõem esta tese é estudar as motivações deste grupo rebelde, sob o enfoque da teoria da agência, dividindo sua estrutura organizativa entre líderes (principal), que tomam as decisões estratégicas, e os combatentes (agentes), que as realizam, em um contexto de informação assimétrica, para tomar decisões racionais. Cada ensaio desenvolve a partir de diferentes perspectivas, mas tendo como base o enfoque racional de principal-agente, as razões que levaram a organização a renunciar a uma de suas atividades criminosas, considerada no princípio como uma ação estratégica eficiente que obrigaria o governo colombiano a negociar. O primeiro ensaio está focado em mostrar os custos de transação que gerou essa estratégia para os agentes e o principal. Esta análise faz uso dos mesmos instrumentos analíticos empregados para analisar os custos de qualquer transação econômica que leva a cabo uma organização legal. Mostrando que os custos dessa atividade foram altos, expressados, primeiro, em um conflito de interesses entre o líder, encarregado de esquematizar e designar tarefas, e os agentes, responsáveis por sua execução. A divergência entre estas duas partes teve origem em uma mudança nas expectativas dos agentes, que preferiam mais atividades de combate às relacionadas com o sequestro, em um contexto de perseguição constante do exército colombiano. O segundo ensaio estuda como essa mesma estratégia afetou o contexto no qual os agentes definem suas preferências. Através do uso de três enfoques diferentes da teoria econômica se expõem três interpretações diversas da mudança nas preferências dos agentes: a) uma mudança no risco; b) uma divergência entre as preferências subjacentes e induzidas; c) a presença de dimensões motivacionalmente salientes. E o terceiro ensaio apresenta um modelo formal para estabelecer um sistema de compensações eficiente que o principal oferece ao agente para atenuar o que sobre seu comportamento gerou o sequestro. Os resultados mostram que, considerando que os recursos das organizações armadas ilegais são escassos, quanto maiores são os incentivos

oferecidos aos agentes para evitar que desertem, menor é a capacidade da organização para penalizar os desertores e menor a utilidade do principal. Simulando o modelo para um conjunto específico de parâmetros se conclui que a incorporação do mecanismo de autocumprimento (*self-enforcing*) dentro da função de utilidade do principal aumenta seus custos e propicia o baixo esforço do agente e seu comportamento oportunista.

Palavras chave: Teoria da agência. Decisão racional. Sequestro político. Custos de transação.

ABSTRACT

The objective of this thesis is to explain the reduction in the rate of political kidnapping in Colombia in recent years by means of analyzing the strategic behavior of its perpetrators. This is the basic question addressed in this thesis. Conventional views interpret the fall in the kidnapping rate as an outcome of President Álvaro Uribe's democratic security policy. I will argue, however, that this is not the whole story, since political kidnapping led Farc [for its acronym in Spanish, Fuerzas Armadas Revolucionarias de Colombia] into an unprecedented strategic situation that induced a breach between leader (principal) and combatant (agent) concerns with strong effects on its overall activity and its decision to stop that criminal action. The focus of three essays making up this thesis is on studying FARC's motivations from the perspective of agency theory, by splitting its organizational structure into principals and agents who are acting on a setting of asymmetrical information. Each essay develops, from different perspectives, the reasons that led the organization to give up that criminal activity due to the substantial political and organizational risks involved. The first essay is focused on the transactions costs generated by the kidnapping strategy both for agents and principals. This analysis is based on the same theoretical tools used to study the costs held by any legal organization. I found that the costs of kidnapping were high, expressed first in a conflict of interest between the leader –responsible for designing and assigning tasks—and the agents in charge of its implementation. The divergence was due to a shift in the expectations of agents who preferred combat activities over the menial tasks associated with kidnapping, in a context of heavy pressure by the Colombian Army. In contradistinction to legal organizations in which such type of divergence can be solved, in part, by paying higher wages to agents in order to extract their best effort, this alternative is not feasible for FARC, for those who joined the organization are supposed to have an ideological and political commitment. The second essay studies how the kidnapping strategy affected the preferences of agents and their behavior by means of using three different approaches from economic theory: (a) a change in risk, (b) a divergence between underlying and induced preferences and, (c) the presence of salient motivational dimensions. The third essay examines, through a principal-agent model, the nature of the *trade-off* between incentives and enforcing mechanisms that the leadership of an Armed illegal organization offers to its agents. Using a MATLAB's optimization tool-box, I computed the optimal transfer system for a given parameterization of the model, and analyzed its properties. The numerical analysis shows that the inclusion of a self-enforcing

mechanism on the leader's objective function increases the costs for the principal and could lead agents to choose low efforts and engage in opportunistic behavior.

Keywords: Agency theory. Rational choice. Political kidnapping. Transaction costs.

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1 INTRODUÇÃO

O objetivo desta tese é explicar a redução na taxa de sequestros políticos na Colômbia nos últimos anos a partir da análise do comportamento estratégico dos criminosos. Entendida a atividade de sequestrar como toda retenção contra a vontade das pessoas, com o propósito de pedir em troca de sua liberdade uma vantagem específica ou tirar algum proveito (artigo 168 da lei 599[1], COLOMBIA, 2000).

O principal argumento dessa tese é que na história recente do país a diminuição dos sequestros tem sido vista como o resultado exitoso da política de segurança democrática do presidente Álvaro Uribe Vélez[2]. No entanto, até agora, se desconsiderou a busca por explicações alternativas à já existente, que bem poderiam ser encontradas a partir da perspectiva da análise dos dilemas organizacionais produzidos pelos sequestros nas Forças Armadas Revolucionárias da Colômbia (FARC) –, da sua interação estratégica com o governo e, em particular, dos efeitos sobre sua atividade global e na decisão de pôr fim a essa ação criminosa.

De fato os trabalhos sobre o sequestro na Colômbia tem se voltado ao estudo de sua evolução (RUBIO, 2003, RUBIO; VAUGHAN, 2007, SILVA, 2006), suas causas (MEJÍA, 2000, RUBIO, 2003) e seus efeitos sobre o investimento econômico e a sociedade (PINTO et al, 2004, PSHIVA; SUAREZ, 2006, RIASCOS; VARGAS, 2011, TRUJILLO; BADEL, 1998), a partir do lado dos que sofrem diretamente suas consequências. No entanto, nesta tese se explora o outro lado, ou seja, as razões que levaram à queda no número de sequestros, a partir do comportamento de agentes racionais agrupados em uma organização que planejou e executou esta atividade criminosa.

Nesse contexto, a escolha metodológica do modelo da teoria da agência para estudar as FARC e o sequestro político se deve a sua flexibilidade para adaptar as relações no interior dessa organização ilegal ao esquema racional de principal-agente. Este método supera os tradicionais, pois permite estudar instituições políticas em que os agentes não são pensados somente com interesses materiais (THOMPSON, 2012). Nesta abordagem o principal toma

[1] Este delito se constitui como um dos tipos mais graves de violação em relação aos direitos fundamentais (a integridade e a liberdade pessoal) e o Direito Internacional Humanitário. De acordo com a Lei 40 de 1993, existem duas modalidades: o sequestro simples e o sequestro extorsivo, e este último dividido em sequestro político e econômico. São várias as organizações ilegais e criminosas que operam no território colombiano, e que o praticam como meio para obter recursos econômicos ou para alcançar benefícios políticos. Entre elas se destacam as organizações subversivas das FARC e o ELN (Exército de Liberação Nacional, outra organização subversiva que opera no território colombiano). Também a delinquência organizada e o narcotráfico são responsáveis pelas cifras de sequestro na Colômbia.

[2] Presidente da Colômbia durante dois mandatos consecutivos, 2002-2006 e 2006-2010.

decisões sobre a atividade da organização e os agentes decidem se "cooperam com o principal" dependendo dos incentivos oferecidos.

Embora não seja fácil pensar no sequestro como uma ação racional pela crueldade que envolve, é claro que a forma em que foi planejado e executado torna inevitável o uso de algum tipo de ação racional na tomada de decisões de quem o faz (SHAPIRO, 2013). A partir dessa perspectiva se deve reconhecer que este tipo de organização armada ilegal, como as FARC, é uma forma de organização racional. Portanto, para entender como operam e como tomam decisões, faz sentido usar a economia e os instrumentos modernos da teoria dos jogos, a teoria da informação assimétrica e o modelo de principal-agente para explicar seu comportamento.

Em especial, para decisões estratégicas como o sequestro político, este abordagem constitui-se num enfoque natural para estudar as relações entre os líderes da organização (principais) e seus subordinados (agentes). Relações que estão cobertas de problemas típicos de risco moral (comportamento oportunista dos agentes), conflito de interesses (entre agentes e principais) e aversão ao risco (dos agentes) por conta de assimetrias na informação (ARROW, 1985, FEAVER, 2003, GIBBONS, 2002, GORBANOFF, 2003, MACHO; PÉREZ, 1994, MAS-COLLEL; WHINSTON; GREEN, 1995, REES, 1985, RICKETTS, 2002, 1986, ROSS, 1973, SHAPIRO, 2013, SPREMANN, 1987, SOWER, 2005). O uso de elementos analíticos da teoria da agência vai além das relações entre empregador e empregado em uma firma no âmbito da organização industrial (SPENCE; ZECKHAUSER, 1971). Sua extensão a outros campos fora da economia permitiram contextualizar e entender as relações cívico-militares (BAKER, 2007, FEAVER, 2003), com aplicações em ciência política (MILLER, 2005, WATERMAN; MEIER, 1998), em economia política (GROENENDIJK, 1997, GAILMARD, 2012), no campo das relações internacionais (ELSIG, 2010, POLLACK, 2006), as relações clericais (ZECH, 2007, 2001), entre estados e agentes terroristas (BYMAN; KREPS, 2010) e na política exterior (KASSIM; MENON, 2003, NIELSON; TIERNEY, 2006), entre outros.

Seu uso neste campo é inovador porque além de ser adequado para a compreensão de problemas organizacionais entre os membros, tem implicações teóricas, empíricas e políticas, a partir das quais os governos poderiam formular estratégias para contrabalançar e atacar as organizações autoras destas ações criminosas (SHAPIRO, 2013).

O ponto de partida para a análise destes grupos armados ilegais como um problema interessante para a teoria econômica do crime é que, ao agir como uma organização, seus

líderes e agentes compartilham de forma ideológica um mesmo fim que os leva a cometer ações coordenadas e efetivas na maioria dos casos. A identificação e a semelhança de interesses são o que os motiva a permanecer no grupo armado subversivo, mais do que incentivos financeiros, e a manter uma estrutura hierárquica, no qual as ordens dadas são obedecidas com exatidão. No entanto, garantir a convergência dos objetivos entre o principal e o agente, e a permanência no tempo como organização, em um cenário de constante mudança e incerteza, são dilemas que enfrenta toda organização legal e ilegal.

Estes problemas podem ser ocasionados pelo contexto externo que afeta suas estruturas internas e as relações entre seus membros. Porém a aparição de um conflito de interesses entre os agentes pode ser motivada, também, pela sua própria interação. Por exemplo, uma situação que resulta das decisões que uns impõem a outros pode desencadear consequências negativas para a toda organização porque estão levando a consideração uma interação estratégica entre ambas as partes.

A questão básica a ser investigada na tese é a seguinte: Se o sequestro, pensado como uma ação racional, fez com que os agentes interagissem estrategicamente com seus superiores, gerando uma brecha crescente entre seus interesses e os dos líderes, dando lugar a problemas de informação e coesão no interior da organização armada.

Além dessas questões fundamentais, outras igualmente importantes deverão ser respondidas ao longo do trabalho a fim de investigar com mais profundidade o problema básico proposto:

a) como as preferências de agentes que não estavam acostumados a esperar por resultados de longo prazo foram se separando das dos seus líderes, criando uma divergência nos objetivos que perseguia cada um e incrementando os custos tanto individuais como para a organização em seu conjunto?
b) como os principais atenuaram estes custos?
c) criaram sistemas de incentivos e/ou mecanismos coercitivos para conseguir dos agentes uma cooperação maior com a organização?

A partir da perspectiva da ampla gama de ações criminosas que existem, por que esta tese se centra no sequestro e não em outro delito? Pela complexidade que implica para qualquer organização ilegal armada realizá-lo. Não é como o assalto, o estupro ou o assassinato, em que o criminoso estabelece momentaneamente uma relação com a vítima e logo se afasta dela (MELUK, 1998). O sequestro político das FARC foi um sequestro massivo e de longa duração. Com ele a organização tentou mostrar sua capacidade econômica e

organizativa não somente para manter grandes volumes de sequestrados, mas também para retê-los por longos períodos de tempo. Em termos de custos de transação, entendidos como os custos de produção somados aos de organização, as FARC tiveram que empregar maiores recursos econômicos e humanos para o cuidado e proteção dos reféns que, em alguns casos, chegaram a permanecer até treze anos em seu poder, perdendo seu valor como moeda de troca aos olhos do governo colombiano.

De fato, durante o período de cativeiro as FARC sofreram as consequências, entre outros efeitos negativos, de anos de convivência entre seus homens e os sequestrados, o que muitas vezes limitou sua capacidade de combate. E levou a que, primeiro, tanto sequestrado como sequestrador enfrentassem o mesmo risco imposto por uma perseguição continua e sem trégua do exército colombiano; segundo, a que a organização, que durante muitos anos se caracterizou por seu hermetismo, se visse exposta e vulnerável pelo fluxo de informação com o meio exterior, produto da constante comunicação que tiveram que manter para negociar as entregas unilaterais dos sequestrados e pelas múltiplas falhas e erros organizacionais e estratégicos que cometeram durante o cativeiro, com desenlaces fatais para muitos dos reféns. Nesse sentido este trabalho contribui com uma explicação teórica alternativa, a partir do ponto de vista dos responsáveis e de seus dilemas organizacionais, de por que este fenômeno diminuiu, pretendendo ser uma das peças que estava faltando aos já tradicionais estudos na Colômbia sobre as consequências econômicas e sociais do sequestro político em organizações armadas ilegais.

Em termos de literatura internacional sobre organizações criminosas, os primeiros trabalhos estiveram direcionados a explicar as corridas armamentistas (INTRILIGATOR; BRITO, 1984, 1985, 1986, 1988) e os eventos terroristas transnacionais (ENDERS; SANDLER, 1991, 1993, 1995, 1996, SANDLER; LAPAN, 1988), mediante o uso de instrumentos econômicos tradicionais. No entanto, só depois dos ataques de 11 de setembro de 2001 o número de estudos sobre o terrorismo e o contraterrorismo cresceu exponencialmente. Muitos a partir da análise da teoria de jogos. E a maximização da utilidade de um lado, e técnicas empíricas de outro, estudaram como, usando estes instrumentos, poderiam se construir políticas públicas mais eficientes para deter o terrorismo. Dentro dessa gama de estudos, se podem identificar correntes que vão desde a explicação das causas e das consequências até seus custos econômicos e sociais (ENDERS; OLSON, 2003, FREY; LUECHINGER, 2003, FREY; LUECHINGER; STUTZER, 2007); os trabalhos formais que modelam estrategicamente a relação entre grupos terroristas e governo (BUENO DE

MESQUITA, 2005a, 2005b, 2007, 2008, BYMAN; KREPS, 2010, CHAI, 1993) e interpretações metodológicas a partir da economia política, usando modelos formais e dados empíricos (BUENO DE MESQUITA, 2008).

Por outro lado, uma clara mostra de sofisticação deste tipo de estudos são os trabalhos apresentados no *Handbook* dois abordagens computacionais sobre o contraterrorismo (2013). Focados principalmente em como os métodos computacionais podem melhorar os dados para prever, através da construção de modelos comportamentais, a ação dos grupos terroristas e como os governos podem antecipá-los e contrapor-se de maneira eficiente. Há o trabalho de Siegel e Jung (2009), em que apresentam duas simulações para captar a natureza estratégica do terrorismo e do contraterrorismo. Ou os estudos dedicados a representar computacionalmente as preferências terroristas sobre os ataques aos Estados Unidos, nos quais se usam modelos de utilidade de múltiplos atributos que simulam os perfis de risco e as probabilidades estimadas de cada estratégia de ataque selecionada (CHATTERJEE; ABKOWITZ, 2011, ROSOFF; RICHARD, 2014).

Em estudos sobre o terrorismo, o sequestro, ou tomada de reféns, se analisa a partir do ponto de vista dos princípios de interação estratégica que provém da teoria dos jogos, procurando entender como os agentes avaliam a decisão de matar ou liberar um refém em um contexto de negociação entre o sequestrador e o representante da vítima (SELTEN, 1976; YUN, 2008).

Quanto a comportamento racional, há os trabalhos de Becker (1968) sobre agentes que tomam decisões criminosas baseadas em uma análise de custo-benefício de sua atividade delituosa. Os de Tullock (1971, 1974, 1975) dedicados ao estudo da decisão individual da possibilidade de participar de uma revolução. E ainda sobre os que desejam pertencer a uma organização mafiosa (POLO, 1995) ou subversiva (GATES, 2002).

No entanto, o trabalho aqui apresentado se insere mais na linha de pesquisa iniciada por Shapiro (2007, 2008, 2012, 2013, SHAPIRO; SIEGEL, 2007), direcionada ao estudo do comportamento terrorista a partir do lado organizacional. Uma visão que vai além dos estudos convencionais que supõem agentes ou pequenos grupos que atuam sozinhos mas que conseguem uma escala de violência que faz do terrorismo uma ameaça real para a sociedade. Estudar grupos terroristas como organizações com algum nível de hierarquia pode permitir conhecer como são dirigidos os processos de recrutamento de novos membros, a contabilidade de seus recursos, o planejamento de novos ataques e seus dilemas organizacionais. Para Shapiro (2013) os problemas que essas organizações enfrentam não

diferem muito dos que enfrentam as organizações tradicionais. Os interesses dos terroristas não são muito diferentes daqueles que são empregados nas instituições legais. E essa é a razão pela quais diversas organizações decidem usar muitos dos instrumentos de gestão que empregam as firmas e as burocracias governamentais.

Dessa mesma perspectiva, os ensaios apresentados nesta tese pretendem contribuir para a esfera teórica, contextualizando as relações estratégicas que surgem no interior das organizações ilegais, de forma dedutiva. Não é para os grupos terroristas que centram seus esforços e atenção em certo tipo de ações, mais imediatas e com resultados de mais curto prazo, que esta tese se volta, mas para uma organização ilegal com ações guerrilheiras insurgentes de mais longo prazo direcionadas a afetar as políticas do regime estabelecido no país e a estabelecer um diálogo direto com o governo para alcançar acordos, mas sustentadas, também, na ideia de que são organizações hierárquicas que enfrentam dilemas sérios de gestão[3].

Usando como referência os sequestros políticos e militares das FARC, seguimos o enfoque e a metodologia de Shapiro (2007, 2008, 2012, 2013), Shapiro e Siegel (2007), a partir da comparação das motivações e do comportamento de agentes de organizações terroristas com indivíduos que trabalham para organizações legais e hierárquicas. Mostrando como as primeiras empregam muitos dos elementos e instrumentos gerenciais presentes em firmas legais.

Para concluir, a hipótese principal desta tese é a de que a estratégia do sequestro político de longa duração, por sua própria natureza, tornou dinâmicas e complexas as relações hierárquicas entre o líder (principal) e os combatentes ou mandantes médios (agentes), através de uma mudança nas preferências dos últimos. Pois se tornou evidente que os agentes não tinham o mesmo entendimento de seu impacto político que o dos líderes da organização. Situação similar à que descreve Shapiro (2007, 2008, 2012, 2013) e Shapiro e Siegel (2007) no caso das organizações terroristas, em que os principais, entendidos como os líderes, tendem a estar mais bem informados que seus agentes (os encarregados de levar a cabo as operações) sobre a relação ou mapeamento de ações e impactos políticos.

Esta análise se apresenta em três ensaios interconectados entre si, em que o primeiro está direcionado ao estudo dos custos da atividade para organização, o segundo, à conduta dos agentes e o terceiro, à dos principais. Os aspectos destacados neles abordam de forma original a relação entre líderes e agentes dentro de uma organização armada ilegal no contexto de uma

[3] Para uma definição de insurgência, guerra de guerrilhas e terrorismo ver Young e Gray, 2011.

ação criminosa específica, tendo em mente que o agente é sempre o fator estratégico básico na organização. Do ponto de vista teórico, esta tese discute de forma explícita, usando o método analítico de teoria da agência, os problemas que gerou na relação entre líderes e agentes e na organização armada ilegal a atividade do sequestro político, ao torná-la estratégica e introduzir fatores como o custo de monitorar os agentes e a probabilidade de castigá-los. Do ponto de vista empírico se procura relacionar especificamente este tipo de problemas com as taxas de desmobilização dos membros das FARC e o declínio de sua atividade militar, justificando, de quebra, o porquê de a organização decidir racionalmente parar os sequestros. Finalmente, para encerrar, são desmembrados de forma mais detalhada os objetivos buscados em cada um dos três ensaios da tese e feita uma conclusão geral com base no que foi visto em capítulos precedentes.

O ensaio I tem como objetivo estudar uma atividade criminosa como qualquer outra atividade legal a partir de uma perspectiva de custos de transação para a organização em seu conjunto. Uma vez identificados estes custos, nos voltamos para os custos que emergem, por um lado, para a cúpula ou líderes e, por outro, para os membros, quando essa atividade é percebida por estes como alheia ao núcleo da organização. Nossa contribuição para a ampla literatura sobre organizações criminais reside em que quando os líderes acreditam que os agentes estão supostamente alinhados com seus interesses, e que as preferências são infinitas, pode acontecer que algumas ações criminosas não serem bem-vindas, aprofundando ainda mais os problemas de gestão entre os membros, mais do que outras atividades, e gerando efeitos contraproducentes para toda a organização. Entendendo as vulnerabilidades destas organizações através de uma análise de custos podem ser propostas políticas mais efetivas para combatê-las.

O objetivo do ensaio II parte da consideração de que as preferências do agente são diferentes das do principal devido ao fato de este último escolher ações que não são bem-vindas para os primeiros. Discute-se, a partir de três perspectivas diferentes, a mudança de percepção do agente diante das decisões do principal. O primeiro enfoque estuda o trade-off entre riscos e recompensas que os conhecem quando decidem fazer parte de uma organização armada. O segundo procura estabelecer que os agentes têm dois tipos de preferência: subjacentes e induzidas e que, dependendo de como os agentes interpretem a nova informação, isto determinará suas preferências induzidas e se estas serão muito diferentes das do principal. Por último, no terceiro enfoque se faz uma análise um pouco mais formal sobre a

mudança de preferências dos agentes devido à presença de dimensões motivacionalmente salientes.

O ensaio III tem como objetivo estudar a natureza do dilema entre incentivos e mecanismos internos que cria a organização para evitar que os agentes se comportem de modo diferente do que o principal espera. Visto que não existe um contrato verificável por lei, como ocorre em outras organizações não criminosas, a organização deverá buscar a justa proporção entre incentivos e mecanismos de cumprimento das tarefas encomendadas, para obter não só seu melhor esforço, mas também a permanência do agente na organização. A contribuição deste ensaio está em, através da construção de um modelo teórico de agente/principal, incorporar formalmente esse mecanismo na função objetiva do principal. Isso acontece em um contexto em que a presença de um agente externo estimula a deserção. Para um conjunto específico de parâmetros encontramos computacionalmente uma solução ótima, entre muitas das que se poderia encontrar se as condições iniciais mudassem.

Antes de expor os modelos e as teorias que procuram explicar ou dar respostas às perguntas e objetivos propostos nesta tese, é importante apresentar alguns fatos estilizados ou regularidades empíricas que caracterizam o problema, de modo que seja possível a formulação de algumas explicações referentes ao tema de pesquisa abordado.

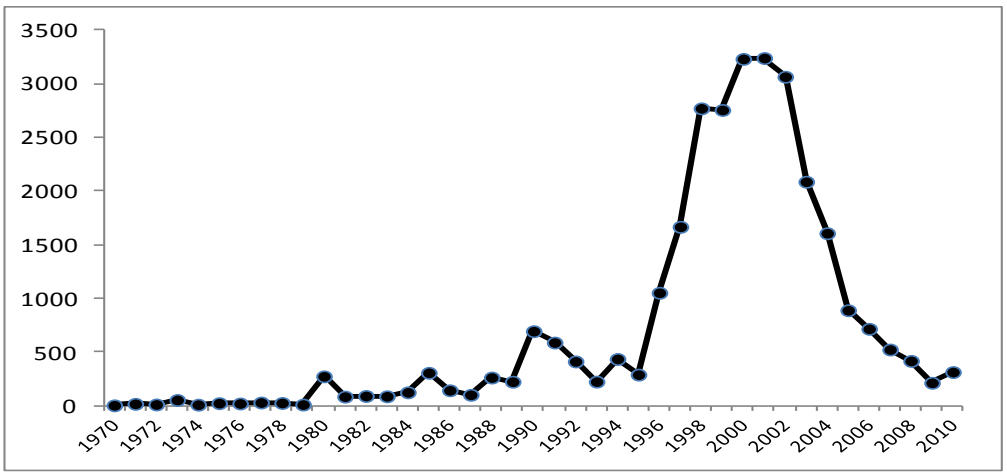
Fato 1: evolução do número de sequestros na Colômbia: o fenômeno do sequestro na Colômbia persistiu nos últimos 40 anos, e tem sido uma prática comum de organizações subversivas, narcotraficantes, paramilitares e da delinquência comum (CENTRO DE MEMÓRIA HISTÓRICA, 2013) e inclusive de algumas esferas policiais do estado. No entanto, no início de 2011, as FARC expressaram publicamente seu compromisso de não realizar mais nenhum sequestro.

Desde 1970 até 2010, este grupo tinha levado a cabo todo tipo de sequestros na Colômbia, sendo responsável por 37% do total de casos denunciados nesse período (CENTRO DE MEMÓRIA HISTÓRICA, 2013). Antes da década de 2000 parecia que o sequestro não só deixava ganhos substanciosos, mas também que a organização era cada vez mais eficiente na captura e posterior condução dos reféns. Porém, as consequências negativas para esta organização, mais que para qualquer outra, da transição do sequestro extorsivo ao sequestro de figuras políticas e agentes a serviço do estado durante o período 2000-2010, foram evidentes. Primeiro, um alto número de membros desertaram dela nesse mesmo período, fenômeno que antes havia sido esporádico e isolado. E segundo, um alto custo

político, não só em âmbito nacional, mas também internacional, até o ponto de serem consideradas terroristas, levou a organização a renunciar ao sequestro.

De acordo com o Centro de Memória Histórica (2013), durante o período entre 1970 e 2010, haviam sido sequestradas pelo menos uma vez na Colômbia 39.058 pessoas. Do total de casos, se presume que 84% foram sequestros por razões econômicas, 14% por motivos políticos e 4% por razões diferentes às anteriores.

Figura 1 – Evolução do sequestro na Colômbia



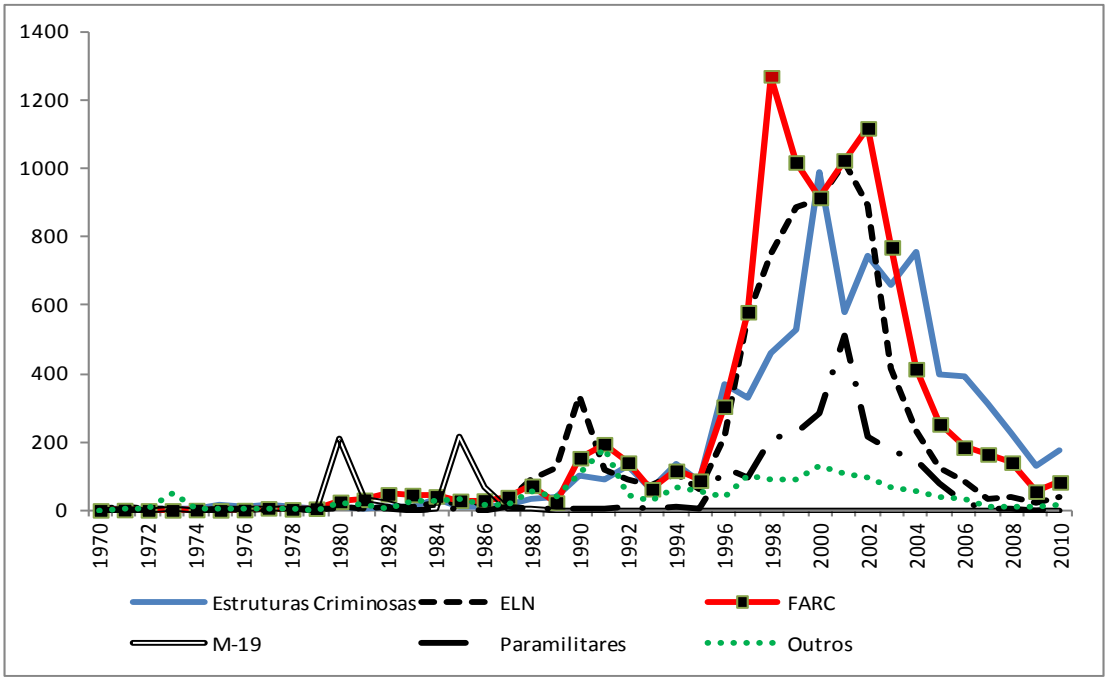
Fonte: Centro de Memória Histórica (2013)**.**

A figura 1 mostra a evolução do sequestro na Colômbia durante 1970-2010, dados que incluem o sequestro extorsivo, em parte o sequestro simples, o de policiais e militares, as "pescas milagrosas" e o tráfico de pessoas em todo o território colombiano. Não estão incluídos nem a custódia arbitrária de menores de idade, nem o "passeio milionário" (considerado sequestro extorsivo no Código Penal desde 2008), nem a desaparição ou o recrutamento forçado nem o tráfico internacional de pessoas (CENTRO DE MEMÓRIA HISTÓRICA, 2013). Embora existam dados de sequestrados desde 1970, foi no período 1996-2006 que se efetuou a maioria dos sequestros. A partir de 2002, a taxa de crescimento se desacelera em parte devido à eficácia e rapidez da política de segurança do governo do presidente Álvaro Uribe, que tinha como principal objetivo a redução do número de sequestros no país.

Fato 2: as FARC tiveram uma participação alta no número de sequestros na Colômbia: na figura 2 mostra que o sequestro classificado por autor, para o período de 1970 a 2010. De acordo com as cifras, as FARC foram responsáveis por 37% dos sequestros no país. Seguem as redes criminosas com 20%, o ELN com 30%, os paramilitares com 4% e outros

com 9%. Neste registro, aparece o M-19 considerado como um dos precursores do sequestro na Colômbia, desmobilizado em 1990 para transformar-se em um partido político. Vendo mais detalhadamente a evolução dos sequestros das FARC notamos que, previamente à negociação de 1998, esta organização exerceu uma forte campanha de pressão realizando todo tipo de ações criminosas, entre elas o sequestro, para conseguir um acordo com o governo. Em resposta, o governo do presidente Andrés Pastrana lhe concedeu um território de 42 mil quilômetros – chamado de zona de distensão –, para iniciar os diálogos de paz. No entanto, graças ao controle territorial outorgado, aumentou sua capacidade de manter escondido um grande número de sequestrados. Em 2002 se desacelera a queda, comportamento que pode estar relacionado a fevereiro desse ano, quando culmina a zona de distensão e as FARC voltam a sequestrar. Finalmente, os dados confirmam que, a partir de 2002, houve uma forte diminuição no sequestro, localizando-se abaixo da taxa média anual, produto de um forte componente da política militar do governo Álvaro Uribe Vélez contra os grupos subversivos.

Figura 2 - Número de sequestros por autor



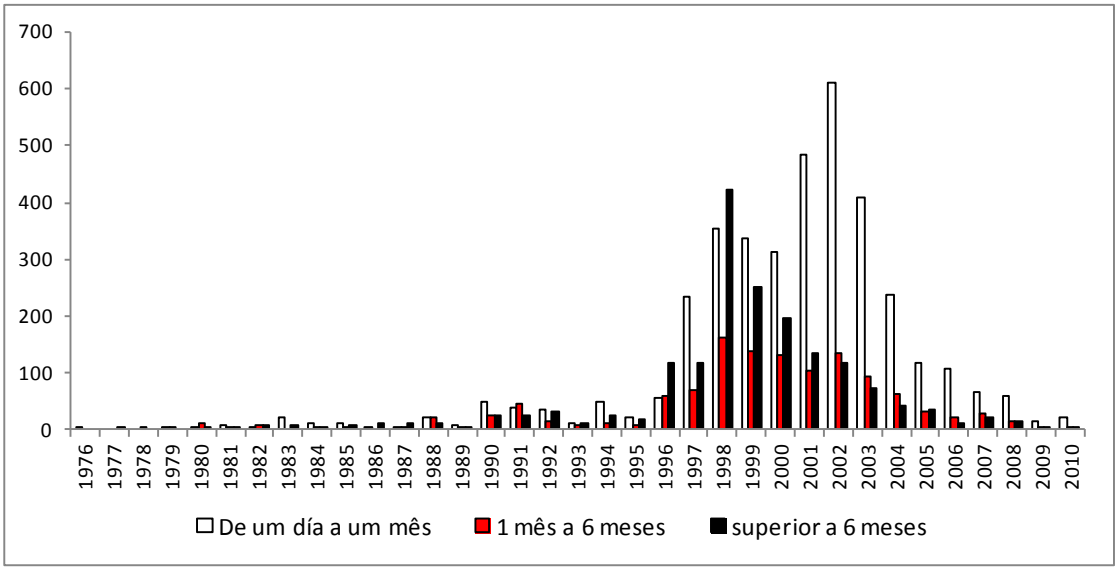
Fonte: Centro de Memória Histórica (2013).

Um fato que cabe destacar a respeito do sequestro na Colômbia é que, de acordo com Pinto et. al. (2004), existem muitas hipóteses que tendem a relacionar os sequestros da delinquência comum com os sequestros dos grupos subversivos e de autodefesas. Diz-se que as FARC, ELN e os paramilitares utilizam os grupos de delinquentes comuns para sequestrar

pessoas nas zonas urbanas, por não contarem com o controle territorial, com o pessoal suficiente nas cidades, nem com os espaços físicos para manter seguros os sequestrados.

Fato 3: duração dos sequestros perpetrados pelas FARC: uma das características particulares que tiveram os sequestros na Colômbia praticados pelos grupos insurgentes é sua longa duração. Os dados que registram casos de reféns que permaneceram na selva colombiana por até dez anos fazem deste delito um dos mais cruéis contra os direitos humanos. A figura 3 mostra o sequestro de acordo com três categorias: de um dia de duração a um mês, de um mês a seis meses e de mais de seis meses. A primeira e segunda categorias podem estar relacionadas com sequestros extorsivos, em que a família negocia diretamente com a organização o pagamento do resgate. Enquanto os sequestros que duram seis ou mais meses podem estar indicando a presença de um processo de negociação um pouco mais longo, em que pode estar envolvida uma terceira parte como o governo e onde as recompensas exigidas geralmente não são de tipo econômico.

Figura 3 – Duração dos sequestros cometidos pelas FARC



Fonte: Centro de Memória Histórica (2013).

Na figura 3 se pode observar a evolução destas três séries e o declínio que tiveram os sequestros de mais longa duração diante dos de curta duração. Cabe ressaltar que os dados mostram a duração dos sequestros sem especificar se a organização alcançou seu objetivo ou não. Em muitos dos sequestros, a duração foi mais curta devido a resgates efetuados pelo Exército, fugas dos reféns ou a morte em cativeiro. Portanto, estes dados apoiam do ponto de vista empírico a hipótese sobre o "fracasso" da estratégia dos dirigentes das FARC, não só ao

obrigar o estado colombiano a negociar, mas também nos problemas causados aos membros que estavam diretamente relacionados com os sequestrados. É por isso que usar o enfoque de principal-agente é uma abordagem inovadora neste campo, porque pode oferecer uma explicação alternativa à decisão de parar o sequestro como algo racional.

Esta tese está estruturada em cinco capítulos, além desta introdução e da apresentação de alguns fatos estilizados (capítulo I). O capítulo 2 busca apresentar o ensaio I, referente aos custos de transação assumidos pela organização armada ilegal em função do sequestro. No capítulo 3 se expõe o ensaio II, que analisa as preferências dos agentes diante desta atividade criminosa. O capítulo 4 mostra o modelo teórico de principal-agente para estabelecer qual é o melhor sistema de incentivos que deverá propor o principal aos agentes para incitar sua cooperação com a organização. Finalmente, no capítulo 5, estão as conclusões gerais da tese, tratando dos resultados obtidos nos capítulos anteriores, as limitações que enfrentou esta pesquisa e algumas sugestões sobre temas futuros de pesquisa neste campo.

2 ESSAY I: THE TRANSACTION COSTS OF POLITICAL KIDNAPPING: FROM AN AGENCY COST PERSPECTIVE[4]

The objective of this essay is to study the effects of a specific criminal activity on the stability of an armed illegal organization (AIO) and how it can work in pressuring it to change its strategy. Based on serious consequences that might result from kidnapping and its long duration on an AIO's stability, this chapter shows why an armed organization would give up that criminal activity.

From an agency perspective, we analyze the high costs that emerge from incompatibility between the leadership's interests and agents' interests when an armed illegal organization decides to carry out a criminal activity alien to its core activity. It is a cost-benefit approach based on rational choice theory.

Our contribution to the literature about terrorists like organizational structures (SHAPIRO; SIEGEL, 2007, SHAPIRO 2007, 2008, 2012, 2013) is to show that in this kind of organization where agents are initially identified to their leader's principles, not all criminal actions are welcome and some of them can lead to more managerial problems than others ones and can generate counterproductive effects. Such a Principal-Agent analysis focuses on how individuals react, or are perceived to react to environmental changes, events and decisions to infer how their cost-benefit analysis change. Understanding the organizations' vulnerabilities may help to government policy makers to develop policies more effective in counteracting AIO strategies.

An unprecedented event in recent Colombia history was the announcement by *Las FARC*[5] that kidnapping –considered as one of the most serious and cruelest violation of basic human rights and freedoms— would no longer be a part of their permanent strategy. The FARC also emphasized their desire to stop the war which they have been waging against the state for almost 50 years. This announcement would go a long way to overcome the huge errors made by the FARC, such as the killing of eleven Colombian deputies in 2007 during a

[4] This manuscript was presented at XVI Conferencia Anual de la Asociación Latinoamericana e Ibérica de Derecho y Economía, Lima, Perú, june 18-19, 2012. And it also was presented at Annual Conference of Italian Society of Law and Economics in University of Rome 3, Italy December 12-15, 2012. A preliminary version of this essay was published in Spanish like "Las FARC y los costos del secuestro" in **Economía Institucional**, 14(27), p.147-164, 2012. I would like to thank Professors Dhammika Dharmapala, Nuno Garoupa and Boris Salazar for their thoughtful comments on this manuscript.

[5] Fuerzas Armadas Revolucionarias de Colombia –the FARC by its acronym in Spanish – are a revolutionary guerilla organization involved in a continuous armed conflict since 1964 in Colombia, located in northwestern South America.

clash between different groups of the same organization, who had been held in captivity in the jungle since April 2002.

The rescue operation carried out by the Colombian Army in July 2008, in which a presidential candidate Ingrid Betancourt, three U.S. military contractors and eleven Colombian police officers and soldiers were freed, as a result of infiltrating the guerrillas, was also one of the FARC's most serious setbacks. Betancourt and the American contractors had been considered by the FARC as their most valuable bargaining chips. After almost fourteen years of kidnapping, these and other occurrences in which many of hostages died in failed rescue attempts, others were rescued, some escaped and others were freed without anything in exchange, reflect a common failure of kidnapping as an efficient war strategy. Even though the FARC have tried to present the decision to stop kidnappings as a gesture of "good will" and vital to a potential peace process in Colombia, we believe there are substantial realistic grounds behind this positive change of attitude.

A possible explanation for their change of position might be the serious economics and organizational consequences of this strategy for the FARC. The leadership's strategy to hold hostages for a long period, imposed partly by the Colombian government decision of not accepting prisoner exchanges and zone demilitarization, resulted in high transaction costs that increased over time. In the organization language, it can be interpreted, in terms of incentive analysis, as a crisis. A crisis is an interruption in the expected flow of incentive. This may be caused by changes either internal or external to the organizations (CLARK; WILSON, 1961).

If the FARC as an organization were seeking to minimize their transaction costs, so stopping kidnapping must be interpreted, not as a gesture of good will, but as a rational decision in which the FARC's agents might return to their past activities and allowing the organization to stop the desertion of their members. With that decision, the organization might be reducing the risk of moral hazard problem associated to activities more difficult to control by the principal.

Shapiro (2013) exposes the same problem for terrorist organizations. There is an inescapable consequence of the nature of terrorism that operations are hard to monitor and the link between what leaders can observe and what their agents actually do is highly uncertain. This is clearest when the outcome of any single attack depends in large part on chance. And in this same respect, our hypothesis is that a criminal activity like kidnapping, defined as unlawfully detaining one or more persons against their will for the purpose of demanding for their liberation an economic gain or other material benefit (VAN DIJK, 2007), sustained over

time by the political or ideological leaders of armed illegal organizations, rebel troops or terrorist organizations (principal), without visible results for their middlemen or low-level operatives (agents) can end up in a principal-agent dilemma; increasing agency costs and, hence the transaction costs in this way. The problem is that the long duration and lack of definition of this type of criminal activity often leads to greater uncertainty regarding what its result will be and how much time will be required for achieving the AIO's objectives. Agents face many uncertainties in a manner other than their leaders do. Agents, whose activities are closely related to criminal activity execution, are in a more risky position for their lives as they are guards of hostages; hence they might become more impatient and would be anxious to achieve a solution earlier that than their leaders do. This emergence of divergence between the leaders' perceptions and those of the organization's operative elements, such as shirking responsibilities or devoting suboptimal effort to the activity, can lead to agents carrying out actions that are unwelcome to their leaders. They may also engage in behaviors that are directly contrary to the goals and strategic interests of the leadership, thereby seeking to diminish the perceived disutility of that activity.

In terms of the present chapter, the important observation is, though leaders can mitigate the impact of this interest mismatch by monitoring and punishing agents who misbehave, doing so is particularly costly where agents can take hidden actions against the AIO (SHAPIRO, 2013). Hence, we analyze the transaction costs of an AIO under the principal-agent approach, emphasizing the *trade-offs* between different kinds of costs assumed by leaders and agents (GROENENDIJK, 1997).

This approach identifies a bilateral relationship in which one party (principal) contracts another (agent) to carry out some type of action or to make some type of decision. The objective of the contract is for the agent to carry out actions on behalf of the principal. In this relationship, the interests of principal and agent diverge: there is an informational asymmetry to the advantage of the agent, but the principal can prescribe the pay-off rules in their relationship (MACHO; PÉREZ, 1994, MAS-COLLEL; WHINSTON; GREEN, 1995, RICKETTS, 1986, STIGLITZ, 1987).

Using that principal-agent structure, we are interested in showing the increase in the transaction costs caused by the separation between the agents' and the leader's interests from the moment the AIO chose kidnapping as a permanent strategy.

When extortion and kidnapping are designed by AIOs as a business and they are successful in raising money for expansion, they tend to be relatively brief affairs. It implies

that the AIO's agents do not spend a lot of their time in the custody of hostages; instead, they can dedicate time to real combat activities. But when an AIO not only chooses hostage-taking as a permanent strategy, but also subordinates the results to external factors like the success of negotiation, showing that they are in no rush and are willing to wait until an agreement is reached, the situation changes: First, combat tasks must be replaced for those of hostage custody, and second, a new hostage-agent relationship may emerge, which may modify the strategic behavior of the agent, putting them beyond the control of the leader or principal. That is to say, individual incentives begin to prevail over collective ones.

The key point here is that political kidnapping pushes the organization's agents into a principal-agent situation, clearly different from the one that motivated their joining the organization. It is a situation that, from a rational point of view, the organization should avoid due to their clandestine and military character. The new situation breaks the most basic rule of organizational rationality, replacing obedience (and allegiance) for individual incentives of unpredictable consequences. In other words, it induces uncertainty within an organization which was initially based on certainty and confidence provided by a closed hierarchical structure.

Given the difficulty, in general, of measuring empirically the transaction costs of a criminal activity, FARC's political kidnapping activities have been selected as a fairly typical case in which it is possible to study the agency costs that rise when either the portfolio of criminal activities is not varied, or when a criminal activity is maintained over time whatever the costs. In seeking to approach an understanding of the effects that kidnapping had on this organization, this work will examine the high rates of demobilization of the FARC's agents and the decline in combat activity compared to Colombian Army's activity during the 2000-2009 period. The methodological choice of an agency model is due to its flexibility in adapting the relationships among all members of the organization within the rational scheme of principal-agent. This method goes beyond the traditional one, enabling to study political institutions in which agents are assumed to have not only material interests (THOMPSON, 2012). In this approach is possible to analyze clearly principal's costs as well as agent's costs when they interact in an illegal setting.

Before proceeding to the analysis, a short note on sources is required. Due to the difficulty of obtaining precise information, from the combatant's side, which would reflect in a direct way on the appearance of agency costs, we are forced to use and rely on the qualitative information that the stories of the some hostages can offer (ARAUJO, 2008,

BETANCOURT, 2010, GONSALVEZ; STANSELL; HOWES, 2009, LÓPEZ, 2011, PÉREZ, 2009, PINCHAO, 2009) and some FARC's documents and a wide variety of historical evidence. This methodological strategy is similar to the approach used by SHAPIRO (2003) in order to apply an organizational analysis to Al-Qaeda.

As noted above, we also make a simple analysis of data of the most relevant political kidnappings of the FARC, those which had more political and media consequences for the organization. Finally, from the empirical point of view, we provide an alternative and complementary interpretation to those of demobilizations and captures, seen until now as the result of the demobilization and reintegration program of the Colombian government[6].

The next section provides a literature review on the Agency Theory. A brief description of the organizational structure of the FARC, which is introduced as an example of an AIO, is given in Section 3. Section 4 shows the effects of political kidnapping on the AIO. Section 5 presents a cost analysis of this criminal activity, with particular emphasis on transaction costs and the cost *trade-offs*. It also explains consequences on the FARC of high agency costs and Section 6 highlights some strategies used by this organization to solve their agency problems. Finally, section 7 concludes by summarizing the key results of that analysis.

2.1 Literature Review

The starting point for our analysis is to study the transaction costs of a criminal activity seen as a legal activity. The transaction costs are integrated and used to model asymmetric relationships between principal and agent. Where the former delegates tasks on the latter, in which the agent is to perform some tasks on the principal's behalf, in a context in which the principal cannot directly observe the behavior of the agent and cannot verify if the tasks entrusted are being carried out (EISENHARDT, 1989, ROSS, 1973). To motivate the agent, the principal must offer a sufficiently attractive incentive scheme in order to obtain his best effort (ARROW, 1985, GIBBONS, 2002, GORBANOFF, 2003, MACHO; PÉREZ, 1994, MAS-COLLEL; WHISTON; GREEN, 1995, RICKETTS, 1986, 2002, ROSS, 1973, SHAPIRO, 2013, STIGLITZ, 1987, SOWER, 2005). This arrangement takes on the shape of a contract that governs and rules the principal-agent theory relationship[7].

[6] Disarmament, Demobilization and Reintegration was a flagship program (DDR) of Álvaro Uribe Vélez's government, during the 2002-2010 period. The former refers to the turn-in of weapons, the latter to the re-absorption of ex-combatants into civilian society.

[7] For a complete revision of the origins of the agency theory, see Mitnick (2013).

An important element of agency models is that decisions are considered to be a *trade-off* between different types of costs. In fact, the principal must monitor the agents' actions which constitute a source of agency costs. Jensen and Meckling (1976) identify those costs as bonding costs borne by the agent and the wealth loss borne by the principal when the agent's do not maximize the principal's welfare.

The use of analytical elements of Agency Theory has gone beyond the relationship between manager and worker in industrial organizations, and is being used in the field of civil-military relations (BAKER, 2007, FEAVER, 2003), applications in political science (MILLER, 2005, WATERMAN; MEIER, 1998), political economy (SHAPIRO, 2007, 2008, 2012, 2013), specifically, to study not only the non-aligned relations among leaders (principals) and their troops (agents) of terrorist groups, dealt with as if they were a licit organization. It has also allowed predicting, for example, a higher use of terror against the civilian population, as a result of the lack of control and communication within the organization. Resulting in an internal disorder within the units subjected to incentives, alien to those of the organization proper. Thompson (2002) shows that the evolution the relationship between a non-violent state (Iran) and a terrorist organization like HAMAS depends on the costs and benefits for each of the actors. Such a relationship will continue to exist while de actor's cost-benefit calculi for contracting remain preferable to the next best alternative. At the same time, others authors suggest that a reduced control of the principal over the agents – and an increased conflict between the initial objectives of the fighters and those imposed by kidnappings – leads to a higher degree of terror and violence, used as a strategy against civilians, without apparent variations in the relationship between these two types of individuals (SCHNEIDER, 2009, SCHNEIDER; BANHOLZER; HAER, 2010). In this same line of research is Haer's (2010) work, in which the principal would have the capacity to control his agents if the proper selection methods were used and if the control and surveillance mechanisms were stricter[8].

2.2 A review of the FARC's organizational structure

The beginning of the FARC as 1964 after a particularly gruesome period of widespread political violence in Colombian history is known as *La Violencia* (1948-1958),

[8] Based on the results of the 96 interviewed members of armed movements in the Democratic Republic of Congo, the author shows the relationship between control mechanisms and the level of violence towards civilians

which claimed over 200,000 lives (ARENAS, 1985, CASAS, 1980, MEDINA, 2008, OFFSTEIN, 2003, PÉCAUT, 1997, PIZARRO, 1991). This period ended with an agreement between the Liberal and Conservative parties to share power for the next sixteen years. Meanwhile, landless rebels organized themselves together under the FARC, which was formally, but not openly, established as a military wing of the Colombian Communist Party. During this time, the FARC numbers ranged from 50 to 500 and were spread throughout the rural areas of central and southern Colombia (Figure 4). The FARC proclaim themselves as an organization that defends peasants, which is oriented towards the achievement of a significant form of social existence for peasants, who feel they have been systematically expelled and excluded from society and state (BOLÍVAR, 2006).

The FARC was only capable of small hit and run tactics amounting to a couple of attacks per month (MADDALONI, 2009). Nevertheless, almost fifty years later, the FARC is considered America's oldest, largest insurgency of Marxist origin (KURTH, 2004) and more destabilizing and the greatest threat of national security today from their political action (RANGEL, 1999). In 2004 the FARC was estimated to have between 16,000 and 20,000 combatants (RESTREPO; SPAGAT; VARGAS, 2004).

The FARC's organizational structure follows a vertical subordination line, rather similar to the structure of any military army, with a top leadership, in charge of making decisions, in the military, financial and strategic fields. This leadership which acts as the maximum authority must be obeyed by all other agents of the organization[9]. However, the complexity and the particularity of the assigned tasks impose a qualification of the former statement. As a matter of fact, the FARC's units on the ground must also take into account the geographical space in which they act, the illegal character of their activities, and the conflict's changing dynamics. That is, the FARC divided in many fronts that operate in very different geographical rural areas, separated from each other and far from the principal's location; makes more difficult for FARC's leadership monitor their agents, allowing them to have a high autonomous decision-taking capacity. It is possible to have fronts carrying out different operations, depending on areas' conditions where they operate. This behavior of fronts or operational cells in the FARC is similar to other terrorist groups like Al-Qaeda, where disagreements are not limited to type of criminal activities; they also occur over finances and how to spend money (SHAPIRO, 2013 p.30).

[9] See Castillo and Balbinotto, 2012.

From the point of view of their illegal activities, the FARC has concentrated, mainly, in combating the Colombian Army, through a guerrilla warfare system. In its early stages, the FARC engaged in the ambushing of military units and raiding farms. Those activities were restricted to the areas where the guerrillas had historically operated.

Figure 4 - Spatial Distribution of the FARC in Colombia

Source: Elaborated by the authors from SIGAC (2013).

The FARC grew in the 1980s by tapping into revenues obtained by exploiting primary commodities, and it expanded and consolidated its operations in resource-rich areas (cattle in the eastern plains, commercial agriculture, oil and gold). Today, its financing activities have evolved to include income derived from activities linked to the traffic of illegal drugs (RABASA; CHALK, 2001). The collection of taxes on cocaine base, the use of illegal runways and the trade and commercialization of cocaine hydrochloride are some of the sources it uses to finance its activities. The expansion also includes the extortion of shopkeepers and businessmen ("vaccines" or revolutionary taxes), the ransom from extortive kidnappings, and cattle rustling or theft (JUNTA DE INTELIGENCIA CONJUNTA - JIC, 2005). These activities generate too income. In the decade of 2000-2010, after the breakdown of relations with President Andrés Pastrana, the FARC increased the wave of individual and massive kidnappings of elected politicians, who were joined by those already held prisoners in previous years, many of them military officers and policemen captured in combat.

According to the statistics of Center Of Historical Memory in the years between 1996 and 2010, this armed group came to hold 8298 people, who were kidnapped for monetary ransom or for political reasons[10].

In order to isolate the effects of political kidnappings from economic kidnappings, we kept our focus on the list of high ranking military officials (captains and lieutenants) and politicians that were held by the FARC during 1997-2010, with the explicit purpose of forcing the government to accept zone demilitarization for peace talks and some type of prisoner exchange (Table 1).

[10] Among the most prominent kidnappings of the FARC is the one which took place on June 9th 2001, when 41 people were kidnapped in the urban area of Valledupar, in the province of Cesar, in the north of Colombia. Also, during the same month, 17 people were forced to leave the building they lived in, in the early hours of the morning, in the city of Neiva, Huila, in the mid-west of the country. On April 11th 2002, 11 deputies from Valle's Assembly were taken out of their building and driven in a bus to the Colombian jungle. The Assembly chambers were located in downtown Cali, the third most important city of Colombia.

Table 1 - Types of Hostages

Type of Hostage	Police and Military Officials	Political Hostages	US Contractors
1997	3		
1998	33		
1999	13		
2000	1	2	
2001		17	
2002		5	
2003			3
2004			
2005			
2006			
2007	7		
2008	1		
2009	1	2	
2010	2		
Total	61	26	3

Source: Elaborated by the authors from information in Colombian newspapers and magazines: El Espectador, El Tiempo, El País, Revista Semana (1997-2010).

To simplify the principal-agent analysis, we adopted the concept of hierarchical structure used by Arias, Herrera and Prieto (2010) in a research for Foundation of Ideas for Peace (FIP), which allows for an easier adaptation of the elements that compose a principal-agent model. This kind of classification of the FARC's agents is defined by The Program of Humanitarian Attention to Demobilized People (PAHD). It is only applied to those who are already demobilized and thus external to the FARC's structure. In the first place, there are the leaders or principals, in charge of guiding and structuring the activities of the organization as a whole, as well as developing the expected negotiation processes with state authorities. Below them, stand the agents (middle managers), which act as a transmission belt between those who make the decisions and the fighters, defined as privates or foot soldiers, who carry them out and put them in motion.

The latter, constitute the bulk of the armed structure. For the FIP, middle ranking agents have control of the territory, the population and the troops; they know in detail the region where they act, and generally speaking, are in charge of the lesser operative tasks and the assignment of specific functions to the agents of the lower ranks. Given their strategic role within the organization, they represent the role of the agent and the leader or leadership represents the principal role in our analysis of Agency Theory.

2.3 Hypothesis: The effects of long duration political kidnapping on an AIO

Two factors explain the effects of long duration political kidnapping on an AIO:

2.3.1 Divergence between the aims of the agents and the leader

Once involved in political kidnapping, leaders have to delegate to their agents, certain operative tasks or jobs, directly related to the hostages' custody[11]. In the hypothetical case, such delegation poses no problem if all agents of the organization were uniformly motivated to reach the political aims of the organization. In such situation the results obtained would be equal to those expected, except in cases in which external conditions alter these results. In other words, any task imposed would be executed and the maximum effort would be expected from their agents. However, the assignment of this type of task, i.e. kidnapping, in a hostile operational setting, to commanders and rank and file used to engaging the enemy in combat, can induce them to look for ways of evading duties not related to fighting the enemy. As Shapiro (2013) states for terrorist organizations: "When the preferences of leaders and agents are not completely aligned, the covert nature of terrorist groups necessarily implies that agents can take advantage of the situation to act as they prefer, rather than as their principals would like." Why, in the case of the FARC, could agent and principal preferences not be aligned in the instance of kidnapping?

In a comparative study between demobilized agents from the FARC and those from paramilitary organizations,[12] Gutiérrez (2008) found abundant evidence against the hypothesis, very common in political economy of crime, that all illegal armed forces are very similar in the ways they act, and questioned the motives young people had when joining the FARC guerrillas. The answers showed that, although financial issues played an important role, the main reasons that fed the base of these organizations, were three:

a) the allure of weapons and uniforms;

b) fear of revenge (from the Army or the paramilitary) and;

[11] In fact, in seized material by the Colombian Army, there is evidence of existence of handbooks and manuals about policies, procedures and rules pertaining to internal function of agents in charge of the custody of persons held in captivity.

[12] The paramilitary or Self-defense in Colombia are illegal right-wing armed groups, that have as their main objective to combat guerrilla organizations.

c) broken homes. For many young peasants, carrying a weapon is a symbol and a source of *status* and of social and political relevance[13].

In this way, by being a guerrilla, these young people identify with something and with somebody. In addition, weapons are a symbol of social recognition and, therefore, their value increase when they are used in combat proper. This implies that a role, different from that of a fighter, would represent a much lower *status*, and is reflected in the way that some of the agents show their discontent with these new assignments[14].

The incompatibility between the leader's and the agents' preferences suggests a first moral hazard problem for the AIO, in the guise of a conflict of interests between the leadership and their agents. The latter, when confronted with this activity, are forced to attempt mechanisms, not visible to the leader, in order to evade these types of duties. For example, the care and custody of a group of hostages, of course, would not fulfill the warring and heroic expectations of the agents, neither those who are already within the organization, nor those who are making up their minds whether to join or not. These types of tasks imply leaving combat aside and engaging in the custody of people in captivity, which by the way exposes agents to face a higher risk of being caught by the Army[15].

The second problem faced by this kind of illegal organization is that, due to its ideology, agents do not officially have any financial reward for the functions performed. Therefore, according to the organization's ideology deviations from the expected behavior cannot be solved with additional monetary rewards, as in other types of illegal organization; they use instead non-economic compensations. In most cases, their statutes establish that whoever decides to belong to the organization should have an ideological commitment and honor it[16]. Therefore, since there are no financial incentives[17] to rate some tasks better than

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[13] Why do the boys want to go off as guerrillas? Because they like weapons, strength, status. Would guerrillas work with a machete? ¡Never! They kiss the weapons and say women love copper/brass, guys who belong to the Army, the Police, the guerrilla (GUTIERREZ, 2008).

[14] The hostages tell in some of their stories that the guerrillas expressed many times that, in depth, they did not agree with the barbaric practice of kidnapping and did not share the fact that we should suffer such a situation. Among other reasons, because it ran counter to the concepts expressed by Jacobo Arenas, the top ideological leader of the FARC, who wrote several articles that appear in the booklets, which, on occasion, they lent us. There, it was stated with total transparency, his total repudiation to kidnapping, as a political practice and, least of all, as a way of financing the war (PÉREZ, 2009, 178).

[15] In accounts of the hostages held by the FARC, they describe the discomfort caused to the guerrilla by the fact of having to be constantly moving, herding people who were neither physically nor emotionally prepared to march in the Colombian jungle, and least of all under the intense and constant pressure of the State forces. Their role as jailers was far removed from their personal motivations to join the guerrilla and brought on negative consequences that affected the compliance and cohesion of the group.

[16] Admission to the FARC is personal, voluntary and conscious, between 15 and 30 years old. Taken from Corporación Observatorio Para La Paz (1999).

others, the problems faced by an AIO become more serious when the assigned tasks are not obeyed and agents act in discordance with the principles of the leadership. Therefore, leaders are forced to look for mechanisms in order to ensure obedience and enforce the tasks assigned to their agents.

First effect: the onset of differences between the leader and the agents.

2.3.2 The relationship with the hostages

The long duration of kidnappings may even lead to cooperative relationships between agents and hostages, previously unknown to the leader. The AIO's agents can be persuaded to take actions against an AIO, such as escaping or surrendering with their hostages. The latent threat of formation of strategic alliances between agents and hostages increases the degree of uncertainty that the leader faces, which, in turn, raises his monitoring costs. On the other hand, those agents, who are closer to the hostages, can also see their costs of concealment and diversion increased if they are planning to cheat on their leader. One of the kidnapped tells about his relationship with his guardian:

> A few days later, Gabriel told me he will be transferred to another FARC's camp. Apparently his colleague reported to the leaders that saw us talking a lot and, thus to prevent that he sympathizes with me, they decided to get him out of my guard (ARAUJO, 2008, p. 43).

This type of behavior could be a signal to the leader as a "good performance" in their treatment of people held in captivity. It is difficult to know what this concept meant for the AIO, since all depends on how the leaders perceived these relationships and what signs the hostages sent. An agent could not appear as too soft or too rigid, because he might be accused of collaborating with the enemy. In fact, in the case of the FARC, the explicit orders from the leader to their agents were not to talk to the prisoners and kill them if there was a rescue attempt. When all is said and done, it would all depend of that relationship between agents and hostages, which, with the passing of time, could become stronger or weaker, with unpredictable consequences and high costs for the principal.

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[17] The FARC have some mechanisms, through which the agents, could have access to certain privileges within the organization or could move up if they had a "good performance". However, faced with the disutility produced by the assigned tasks, these privileges were not enough and the probabilities of eluding these types of actions, increased within the group. Or it manifested itself in their behavior and in their relationship with the hostages, which varied between being either very rough or too condescending with them. This again, generated tension among the agents of the organization (GUTIÉRREZ, 2008).

For the leader, it is difficult to know what type of relationship exists between agents and hostages. The leader does not know if the links being forged could bring about benefits or damages to the AIO. In these situations, the principal faces a higher uncertainty: not only should he seek to know if the agent is performing the designed task, but he should also be aware of the interaction between agents and hostages and how it affects the AIO. Of course, the consequences could be variegated, from alliances, escapes or even the death of the hostages[18]. In this sense, a valid hypothesis, which can be tested not only in this situation but in other similar ones, is that, when an agent is exposed to an interaction with the object –in this case the hostages– over which his supervision has been entrusted, and this relationship is prolonged in time, it becomes more and more difficult for the leader to know exactly the agent's actions. Therefore, the leader will be forced to incorporate in the incentive system some element that tests accountability, reflects or signals, whether to stimulate or discourage that new relationship. The principal should establish new enforcement mechanisms to maintain the organization and deter defection[19].

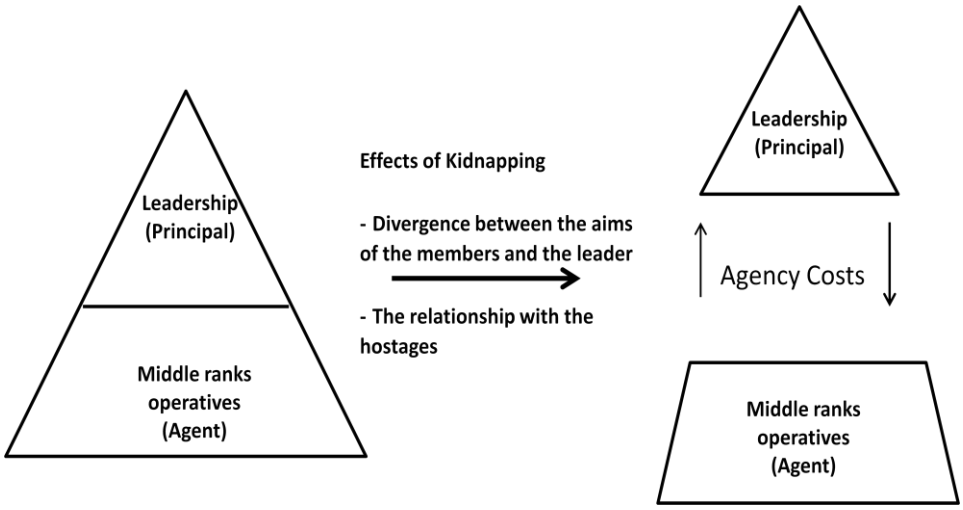
Second effect: A new element is incorporated into the relationship between agent and leader –the relationship between rank and file agents and hostages.

Political kidnappings lead to possible agreements which emerge from the agent-hostage relationship and create an interest divergence between leadership and agents. The AIO's agency costs increase from these situations (Figure 5).

[18] After almost six years holding eleven diputies from the Asamblea del Valle del Cauca, south of Colombia as hostages, the FARC announced the death of ten of them, killed by the organization. The FARC attributed it to a security mistake/error among the custodians.

[19] In fact, in the stories told by the hostages (ARAUJO, 2008, BETANCOURT, 2010, GONSALVEZ; STANSELL; HOWES, 2009, LÓPEZ, 2011, PÉREZ, 2009, PINCHAO, 2009), it can be seen that the rotation of the operatives in charge of custody, is high. It was frequent for the FARC leaders to relieve the operative when some change in the behavior of the hostages was perceived.

Figure 5 - Effects of Kidnapping



Source: Elaborated by the Author (2013).

Notice in Figure 5, the triangle on the left side would represent a high cohesion of the AIO while the triangle on right side will be representing a strong separation between two parts make up the organization as a result of the kidnapping effects. Such a separation is primarily due to an increase in the agency costs in which the principal must invest resources in order to identify deviant behavior and being able to wield a threat over agents. Meanwhile, agents must create mechanisms in order to avoid their detection.

2.4 The Costs

Decisions about concerning political kidnapping are best understood in terms of a *trade-off* between achieving the political goal and the fact that a greater impact, spurs greater consequences for the organization. An analysis of transaction cost may clarify this logic. Because of the difficulty in obtaining real data to build cost functions approached for the AIO, we present a sketch of the shape of cost curves that cost functions should have.

2.4.1 The transaction costs and the kidnapping

Executing a political kidnapping strategy by an AIO can be seen through the same lens as an investment strategy by a legal organization. For example, engaging in kidnapping and taking hostages operates in a quasi business fashion. Before the kidnapping itself, the AIO has to select its targets, plan and design the ways of holding a person or persons as hostages.

The locations of hostages, the kind of men assigned to custody tasks, among other things, have high costs and associated risks[20]. Once the illegal organization has the hostages in its possession, a new problem arises in which the AIO must deal with them in captivity. The reallocation of their organization agents from combat tasks to custody tasks, the setting of an initial "value" for the kidnappings, measured in accordance with their bids to the government, also implies high costs that include not only monetary quantities but also non-monetary ones. These can be classified under the concept of transition costs, analogous to the costs of operating a market or completing a transaction. Let's look at this quote related to the number of men allocated to the care of three kidnapped:

> From the beginning of our stay at Monkey Village, we tried to figure out who was important and whom we might be able to work to our advantage among the FARC. We were there with about thirty guerrillas, an estimate we based on the rotation of the guards (GONSALVEZ; STANSELL; HOWES, 1999, p. 101).

In economics, as noted by Coase (1960), the transaction costs branch emphasizes their importance for the allocation of resources and the structure of the economic organization. In Williamson (1979; 1981a; 1981b), transaction costs are closely related to organization theory and overlapped extensively with contract law. They can be divided in ex-ante and ex-post costs. The first are the costs of drafting, negotiating and safeguarding an agreement. The costs of monitoring and controlling the execution of an agreement are ex post costs. Transaction costs will differ depending on the type of transactions, the degree of uncertainty that the individuals face, and the "asset specificity", e.g. the extent to which the good and the transaction concerned are geared to one another (RICKETTS, 2002, GROENENDIJK, 1997).

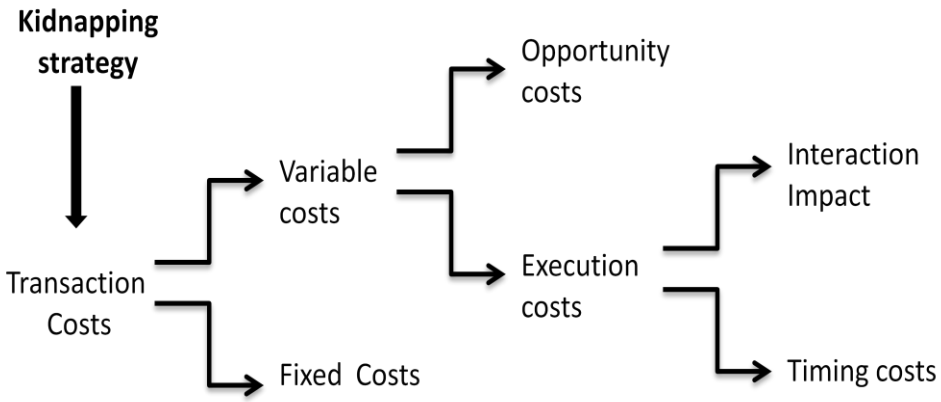
On the other hand, Benham and Benham (2001) defined the costs of exchange as the opportunity cost faced by an individual to obtain a specified good using a given form of exchange with a given institutional setting. In their words, the cost of exchange C_{ikjm} is the opportunity cost in total resources –money, time, and goods– for an individual with characteristics *i*, to obtain a good *j* using a given form of exchange *k* in an institutional setting *m*. The cost of exchange therefore includes both the cost of the good itself and the transaction costs incurred by the individual in obtaining the good.

Following a methodology proposed by Collins and Fabozzi (1991) for measuring of transaction costs, and by Groenendijk (1997) applied to corruption, we adopt their

[20] Miracle fishing' (the mass abduction of locals and business people) is a common tactic used by such groups, followed by an assessment of the catch and a "valuation" of each victim.

methodological process to define and apply this concept to an AIO involved in carrying out criminal activities, such as political kidnapping. We assume that the kidnapping strategy, treated as an investment strategy has a fixed and variable component. The fixed component is easily identified; it may consist of a set of non-monetary payments, commissions directly related to the logistic operation of kidnapping as monetary payments to militias in order to get information about the possible targets. For example, in material on the FARC computers and hardware seized by Colombian Police, before kidnappings, there was to be much intelligence-gathering by militias. These reports suggested that the FARC analyze closely their victims. It also included maps of their workplaces, the individual's likes, habits, political affiliation, routines, social life, etc. In fact, the report was to include guests or strangers to town and an evaluation if there was anyone worth kidnapping for extortion or politically worthy to swap for the FARC agents in prison (DELGADO-KLING, 2013).

Figure 6 - Transaction Costs of Kidnapping



Source: Elaborated by the Author (2013).

The variable component, that is clearly more difficult to measure, consists of execution costs and opportunity costs. The opportunity costs are defined as the difference between the performance of an actual strategy and the performance of another desired illegal strategy. Figure 6 above displays the transaction cost structure of kidnapping strategy divided into variable costs and fixed costs. Variable costs are divided into opportunity costs and execution costs. Execution costs are divided into interaction impact and timing costs. Each of them will be explained in more detailed below.

2.4.2 Cost Tradeoffs (between Opportunity and Execution Cost): The opportunity Costs

The cost of kidnapping involves an opportunity cost intended as the value of the highest-valued alternative use. Opportunity costs may arise when a desired strategy fails to be executed. They represent the difference between the performance of the desired investment and actual strategy, after adjustment for execution and fixed costs. In the economic literature, opportunity costs have been characterized as the "hidden" cost of trading. Its measurement is subject to the similar caveats of the measurement of execution costs. An example of this would be a criminal activity such as extortion against big national and foreign businesses, or the control of cocaine production, adjusted for fixed costs and execution costs. The performance differential reflects the cost of not being able to implement all desired illegal activities. The true measure can be calculated only if one knows what the performance of a strategy would have been if all desired trades had been executed at desired times across an investment horizon. Given that these desired trades are the ones that could not be executed, opportunity costs are inherently unobservable. The definition of investment costs most used is the difference between expected performance and actual performance of the activity.

2.4.3 The execution costs

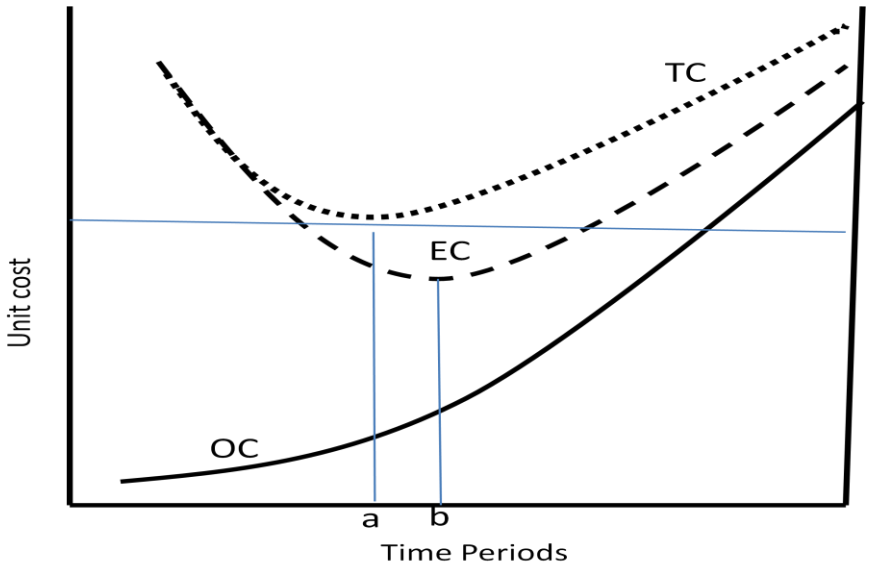
An execution cost arises out of the necessity for an immediate result and reflects the compliance with the AIO's requirements and the interaction activity on time. The problem with measuring execution costs is that its true measure is not observable. That is, the difference between the value of the exchangeable good (hostages), in the absence of the interaction, and the actual execution price. The first one can be thought of as the "price" imposed by the AIO, measured in terms of political demands on the Government.

The actual execution price can be viewed as the return the AIO gets when a hostage gets outside its control or is freed. In many cases, when a hostages escapes, or is rescued, or is dead in captivity, or is unilaterally freed, the price is close to zero. The execution price may, for example, be influenced by external factors beyond the AIO's control such as the pressure exerted by the Army, the presence of intermediaries or third parties, and the alliances between agents and hostages, among others.

Analyzing criminal transactions through the same lens as non criminal transactions, we summarize the costs for an AIO when carrying out the political kidnapping. The following

interpretation is based on Williamson's (1986) analysis. Figure 6 below displays the "almost" tradeoff between execution costs and opportunity costs.

Figure 7 - TC: Total Cost; EC: Execution Costs;
OC: Opportunity Costs



Source: Elaborated by the author (2013).

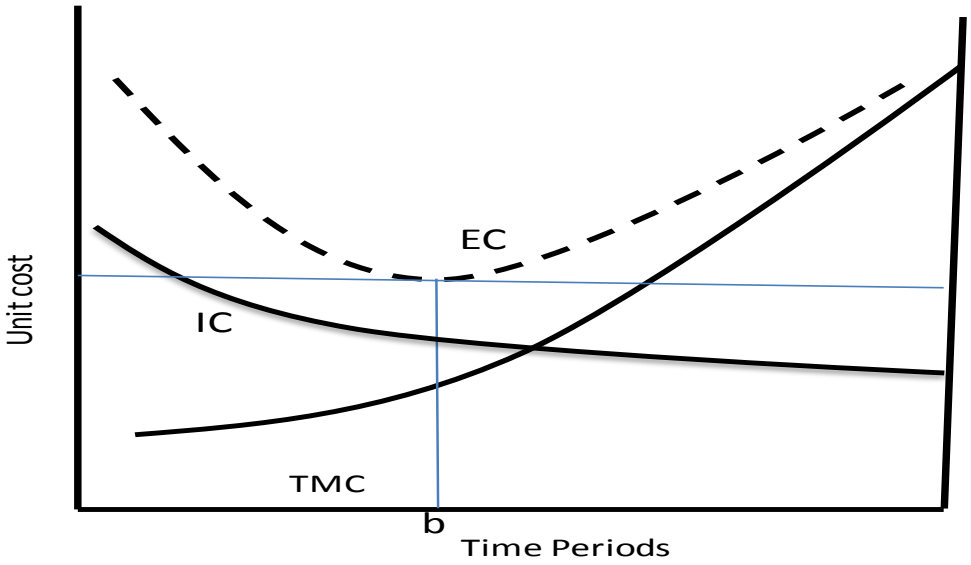
The vertical axis represents unit costs. The horizontal axis represents time periods. The total costs (TC) are the sum of execution costs (EC) on the one hand, and opportunity costs (OC), on the other.

Figure 7 shows that all costs grow as the captivity time grows after point *b*. Now, let's assume that the AIO seeks to minimize its TC. Before point b, the shorter captivity time, the lower EC. This shows that EC are positively related to immediacy of execution until point *b*. After this point, OC and EC grow, but EC grow even more rapidly. The upward-sloping line represents OC and shows that they are positively related to delay in execution. That is the solution or result of kidnapping. The TC are represented by the parabola and can be minimized by an appropriate *tradeoff* between EC and OC before point *a*. However, beyond point *b*, it is no longer a tradeoff between EC and OC and instead, they show an increasing trend over time. What happens after point *b*?

In order to answer this question and to display how execution costs change as the captivity time increases, we break down such costs into two components: *impact cost* (IC) and *timing cost* (TMC) as shown in Figure 8. The first one could be equated with the cost of kidnappings when in the give-and-take process between government and an AIO, none of the

parties is willing to compromise on its position, making waiting seem endless. That may lead to a situation of increased uncertainty for both parts. Timing costs could reflect the effect that the long duration inherent in kidnapping has over the relationship between leadership and agents. Such timing costs or agency costs arise and evolve with the duration time of captivity and can be further broken down into costs for the leader and agents, separately. The downward-sloping line represents IC and displays that these costs are negatively related to delay in the delivery of hostages.

Figure 8 - EC: Execution Costs; IC: Impact Costs; TCM: Timing Costs



Source: Elaborated by the Author (2013).

That is, when a criminal action is perpetrated by an organization with visible effects and political impact (RUBIO, 2003), in the immediate aftermath of such action, it gains the most attention from the mainstream to the media. At the beginning, it implies a high cost for the organization's reputation. However, as the kidnappings continue over a longer period of time for much longer and the number of hostages increases, the reputation costs for the organization tend fall or not grow because people may become accustomed to such effects.

The upward-sloping line represents TMC and displays these costs as positively related to delay in delivery times. As we stated above, agents have clear preferences about combat actions and so, they prefer quick results (GUTIÉRREZ, 2008, MEDINA, 2008). With kidnappings, the results are uncertain and may take a long time. In general, they depend on external factors that may originate from interaction between government and the

organization's leadership and not only the direct effort of agents. A delayed negotiation and a strong army pressure may break agents' patience and encourage them to make other actions against the principal's interests[21].

The parabola displays execution costs, which are consistent with EC in Figure 7. In order to reduce the IC, the AIO could be compelled to delay or postpone the release of hostages until the government is willing to negotiate an agreement under of the terms of the AIO's proposals –at the expense of increasing the likelihood of a rescue mission by the Army–. However, this in turn may lead to extending the negotiations which gives rise to the agency costs (Figure 8). Those costs are associated with the leadership's costs of monitoring and controlling agents' behavior and concealment, and diversion costs by agents. In these situations, the leader must strongly monitor the agents' activities in order to stop or punish those agents who disobey orders. Considering that contracts of criminal organizations are not enforceable in court, they must assure some kind of self-enforcement such as the threat and use of violence (GAROUPA, 2001). However, the principal face a familiar organizational dilemma because exercising control as use of violence can put the principal's life at risk (SHAPIRO, 2013). At the same time, agents are expected to spend resources in making sure that their leader will not take actions against them (bonding expenditures).

The decisions regarding which type of activities to perform can be better understood in terms of a balance between creating an event with a great political impact and its cost. This cost is directly related to the immediate reaction of the State. Thus, high-impact actions will imply larger efforts from the government to counteract them. The leader searches for a level of impact in which the benefit is greater than the cost in terms of the government's response (CASTILLO; BALBINOTTO, 2012).

The cost of implementing a high impact criminal action is an integral part of the decision making process of an AIO, and has a direct effect on the activity's results. As in legitimate business, any choice of engaging in a criminal activity must weight its transaction costs and its opportunity costs. Because of these costs, for an AIO makes sense being aware of the implications and the tradeoffs of its strategies. The decision of maintain the kidnapping for a long period of time had a considerable impact over the relationship among members. The agents were not inclined to bear all on their own consequences of a lengthy negotiation with the Colombian government in a hostile setting, while the principal had another expectation

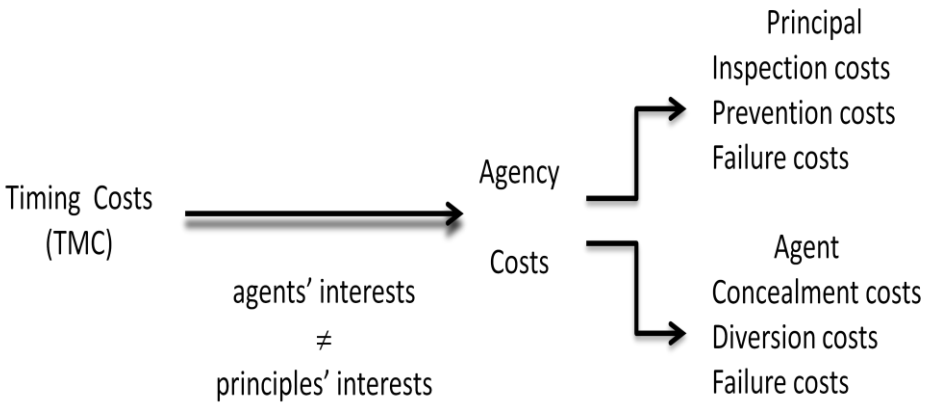
[21] According to the hostage account: "In the years to come, the government's strategy would be to let time pass, hoping that our lives would become less valuable, forcing the guerrillas to release us without obtaining anything in return. We were being given the heaviest sentence that could be inflicted on a human being, that of not knowing when our captivity would end" (BETANCOURT, 2010, p. 112).

about the political development of that agreement. As Shapiro (2013) argues on different points of view of leader and agent and, it could be applied to our case, political impact is the appropriate maximand and there are many examples of terrorist organizations struggling to find the appropriate organizational structures to meet their political ends. However, in the case of the FARC, their leadership has longer time horizons those agents for achieving the organization's political cause.

2.4.4 High Timing Cost leads to the emergence and growth of agency costs

The agency's problem arises when agents' interests and behavior are not consistent with the principles' interests. Therefore, when the AIO is facing timing costs, the rise of agency costs is an obvious result (Figure 9).

Figure 9 - Timing Costs



Source: Elaborated by the Author (2013).

Conflict of interest may also arise between leaders and agents with respect to the timing of results or as the case of terrorist organizations illustrated by Shapiro (2013), with respect to resource allocation and tactics.

Leaders will be concerned with all future results that they can obtain from their strategies in the future. However, agents may only be concerned with immediate results of a task that they are not enjoying very much, leading to a bias in favor of short term results of specific criminal activities at the expenses of long-term results. Such situation may also lead to agents using hidden actions to obtain benefits faster in an attempt to maximize their welfare in the short term.

2.4.5 Agency Costs for the Principal and the Agent

In this section, Groenendijk (1997)'s analysis applied to corruption problem is adapted to kidnapping problem, in order to show the behavior of these principal and agent analyzed in terms of the costs and benefits associated with their actions.

Let *L* be a principal, and *A* an agent. *A* can choose an action $a \in \mathcal{A}$, where $\mathcal{A}$ is an interval between 0 and 1. Such action contributes to the realization of an outcome $r \in R$. For simplicity, it is assumed that there are only a finite number of elements in this set. In choosing an action, *A* is supposed to behave on behalf of *L*'s interests in return for compensation of some kind $c \in C$. So, the outcome *r* is determined by the agent's choice of action and a random shock that occurs after the agent has made his or her decision. The *L* observes *r* but not the agent's action or the shock.

Therefore, *L* is unable to observe *A*'s behavior and he has only the outcomes by which to assess and to reward *A*. So, the relationship between action and the outcome is defined by the conditional probability $p(r|a)$. This function is the probability distribution of outcome given the action *a*, it verifies that $p(r|a) > 0 \; \forall a \in A, r \in R$ and $\sum_r p(r|a) = 1 \; \forall \; a$.

Assume that *A* cares about this compensation and his actions. *L* only cares about the outcome observed and the compensation will pay to *A*. Given that *L*'s interests do not match *A*'s interests, their utility functions as:

$$u_A = u(c, a) \quad \text{with } {}^{\partial u_A}/_{\partial c} > 0; \; {}^{\partial u_A}/_{\partial a} < 0$$

$$u_L = u(r, c) \quad \text{with } {}^{\partial u_L}/_{\partial r} > 0; \; {}^{\partial u_L}/_{\partial c} < 0$$

Both individuals want to maximize their own utilities. It is assumed that there are two possible results $r_1 = a_1 + \varepsilon$, and $r_2 = a_2 + \varepsilon$, two actions $a_1 > a_2$ and two compensations, $c_1 = c(r_1)$, $c_2 = c(r_2)$; as $r_1 > r_2$ then $c_1 > c_2$. There are four possibilities depending on the previous outcomes:

	Outcomes	
A's actions	r_1	r_2
a_1	*(1)*	*(3)*
a_2	*(2)*	*(4)*

Since *L* observes the output but not *A*'s actions, he is unable to distinguish between situations 1 and 2, nor between 3 and 4.

Assume *L* has an expected utility function if *A* chooses *a*

$$p(r_1|a_1)u(r_1, c_1) + (1 - p(r_1|a_1))u(r_2, c_2) \quad 1)$$

If *A* chooses a_2

$$p(r_2|a_2)u(r_2, c_2) + (1 - p(r_2|a_2))u(r_1, c_1) \quad 2)$$

$(1) > (2)$. This is because $p(r_1|a_1) > p(r_2|a_2)$. If the outcome is r_2, *L* experiences a welfare loss. In order to change the situation, he can adopt one of the following measures:

a) **A scheme of compensations:** in order to change the *A*'s behavior, *L* could offer a refinement of the original compensation scheme:

- Case 1: A compensation $c_1 + \gamma$ instead of c_1, hoping that $u(c_1 + \gamma, a_1) > u(c_1, a_1) > u(c_2, a_2)$, in which case *A* will pick a_1, *L* will have the following utility and will pay $c_1 + \gamma$ to *A*.

$$p(r_1|a_1)u(r_1, c_1 + \gamma) + (1 - p(r_1|a_1)u(r_2, c_2) \quad 3)$$

- Case 2: A negative incentive $c_2 - \gamma$, making less attractive to pick a_2, hoping that $u(c_2 - \gamma, a_2) \ll u(c_2, a_2) \ll u(c_1, a_1)$. This negative incentive for example could stand a punishment imposed by *L*.

b) **Enticement:** when *L* adopts this measure, he is trying to make the agent's utility as close as possible to his utility. A possible new utility function for *A* is thus,

$$\bar{u}_A = u(c_1, a_1, (1-\beta)r_1) \quad (4)$$

With this, *L* is allowing that *A* has equity in his benefits $(1-\beta)r_1$, with $0 < \beta < 1$. A's new utility takes arguments from *L*'s utility. It works like an equal distribution of booty incorporated into contract between agent and leader. In intuitive terms, it represents the principal's wish and intention about the agent can have a more active participation in the organization. As Shapiro (2013, 108) argues "most normal organizations solve such problems by writing contingent contracts that give their personnel a stake in the organization's success. Law firms follow a partnership structure, businesses use stock options, and sales firms pay commission." However, these types of contract are not feasible for the FARC because as described earlier, their members receive non-monetary payments.

c) **Restriction of alternatives:** given *L* and *A* belong to an illegal organization with a hierarchical vertical structure, *L* can reduce the discretion *A* has. It means that *L* can narrow the set of available alternatives to *A*. In this case, one action is prescribed (a_1) and the other (a_2) is not allowed. However, it's often hard for *L* to do that because he doesn't have control over how *A* does it. This will imply *L* must employ big resources to monitor *A*'s performance and to avoid *A* chooses that alternative.

As stated above, without any monitoring measure, *L* has only the outcomes r_1 and r_2 to assess *A*'s behavior. In order to control that behavior *L* requires more information and more resources. Thus, *L* should incur costs called inspection and prevention costs. In illegal context, the armed organizations concentrate a large share of resources to monitor agents' compliance with their commitments and create mistrust mechanisms encouraging the idea that one is to monitor the others (GONSALVEZ; STANSELL; HOWES, 2009). This technique has been widely used by the FARC over the time as a way of control over their members. Because the leader is geographically isolated from agents as a security measure, such technique is a cheaper and a high effective tool for the leader. Each agent was himself a watchman of others and it became a common practice in the kidnappings. For example, the FARC's leaders were seriously interested in avoiding any rapprochement between their agents and hostages, so they

encouraged informing on one other agents who showed a close relationship with the hostages or were not very rude to them. However, too much control and oversight would put the leader at risk, while too little means agents would tend to have an opportunistic behavior (SHAPIRO, 2013).

In other hand, when the outcome is r_1, there still exists the possibility that A has chosen action a_2 instead of a_1, as it was mentioned before. Despite *A* choosing a_2 has been paid by *L* as if *A* had chosen a_1. In this case, *L* is not suffering a welfare loss but he could be wasting resources. To prevent that situation *L* will use the same measures as when he observes r_2.

2.4.6 A's reaction

The utility of *A* is seriously affected when *L* uses a negative incentive. If we assume that *A* has chosen a_2, *A* will have:

$$p(r_2|a_2)u(c_2, a_2) + \big(1 - p(r_2|a_2)\big)u(c_1, a_2) \tag{5}$$

If *L* introduces a negative incentive, *A* could get $c_2 - \gamma$ if chooses a_2 instead of a_1, getting c_2. In this case

$$\begin{aligned} &p(r_2|a_2)u(c_2, a_2) + \big(1 - p(r_2|a_2)\big)u(c_1, a_2) > \\ &> p(r_1|a_1)u(c_1, a_1) + (1 - p(r_1|a_1))u(c_2, a_1) > \\ &> p(r_2|a_2)u(c_2 - \gamma) + (1 - p(r_2|a_2))u(c_1, a_2) \end{aligned} \tag{6}$$

Then, the welfare loss for *A* associated with this negative incentive is

$$\begin{aligned} &p(r_2|a_2)u(c_2, a_2) + (1 - p(r_2|a_2)u(c_1, a_2) - p(r_1|a_1)u(c_1, a_1) - \\ &-(1 - p(r_1|a_1))u(c_2, a_1) \end{aligned} \tag{7}$$

When *L* uses a positive incentive, *A*'s welfare will increase from

$$p(r_2|a_2)u(c_2, a_2) + (1 - p(r_2|a_2))u(c_1, a_2) \tag{8}$$

To

$$p(r_1|a_1)u(c_1+\gamma,a_1)+(1-p(r_1|a_1)u(c_2,a_1) \quad (9)$$

When *L* uses persuasion it's not clear whether *A* is worse off or not, because the utility levels are not comparable. For example, if *A* picked a_2 instead of *a* because

$$p(r_2|a_2)u(c_2,a_2)+(1-p(r_2|a_2)u(c_1,a_2) > \\ > p(r_1|a_1)u(c_1,a_1)+(1-p(r_1|a_1)u(c_2,a_1) \quad (10)$$

Now, if *A* was persuaded by the *L*, then he/she will choose *a* instead of a_2

$$p(r_1|a_1)u(c_1,a_1,(1-\beta)r_1)+(1-p(r_1|a_1)u(c_2,a_1,(1-\beta)r_2) > \\ > p(r_2|a_2)u(c_1,a_1,(1-\beta)r_1)+(1-p(r_2|a_2)u(c_1,a_1,(1-\beta)r_1) \quad (11)$$

Is *A* better or worse? It's not possible to give an accurate response because

$$p(r_2|a_2)u(c_2,a_2)+\big(1-p(r_2|a_2)\big)u(c_1,a_2) \\ \neq p(r_2|a_2)u(c_1,a_1,(1-\beta)r_2)u(c_2,a_2)+ \quad (12)$$

$$(1-p(r_2|a_2)u(c_1,a_2,(1-\beta)r_1)$$

When *L* implements a restriction of alternatives, it leads to a welfare loss for *A* as when *L* uses negative incentives. However, in the practice it is almost impossible to carry out this kind of measures in which are implemented a restriction of alternatives due to the leader can't observe the agent's performance. In setting of asymmetric information, a mix of compensation and punishment systems may work well for the leader without additional risks. As choosing only a punishment system over compensation one can lead to threats from agents over the principal:

a) agents can defect to the government (to desert) and;

b) or can attack the principal physically, politically, or both (SHAPIRO, 2013).

2.5 Some data about the FARC's kidnappings

As a case in point, within the FARC, kidnapping activity generates a *trade-off* between the costs of taking care of the hostages (not only in terms of financial resources) but also in manpower, and costs related to other activities (even financial activities) of the organization. This kidnapping strategy was based on the expected political benefits that might have been obtained in the medium term, if the expectations the FARC had about the government's actions had been fulfilled.

The FARC's expectations on the kidnapping of politicians and high ranking military officers were highly optimistic: they expected a great national political and media impact, which would force the government to find mechanisms for prisoner exchange and zone demilitarization. However, the decision to engage in kidnapping produced results quite different to those that had been expected.

In 2001, the FARC obtained the liberation of only 15 guerrilla fighters in exchange for some kidnapped army officers[22]. Table 2 displays the results of the hostages kidnapped by the FARC in almost fourteen years of continuous imprisonment, characterized by Castillo and Balbinotto (2012).

Table 2 - **The Final Result of Hostages**

Year	Total	Rescued	Killed in captivity	Released	Escaped
2001	68		1		
2002	71		2		
2003	58	3	13		
2004	58				
2005	58				
2006	56		2		1
2007	50		12		2
2008	30	15		6	
2009	26			7	
2010	22	2		4	
2011	11	1	4	6	
2012	11			11	
Total		21	34	32	3

Source: Elaborated by the authors from information in Colombian newspapers and magazines: El Espectador, El tiempo, El País, Revista Semana (2001-2012).

[22] This took place in two stages. The first, on June 2nd, 42 policemen and army officers, who were sick, were exchanged and then, on June 27th, they handed over 310 army men in their control.

Looking at how detrimental the kidnapping was for the hostages, the results show that the costs were higher than the benefits the FARC obtained. We can also observe in Table 2 that, after many costly results, not only political but also social and financial, such as the death of hostages in captivity, the escape, and the rescue of hostages, the FARC had to give in. They were forced to surrender the hostages without any type of prisoner exchange and or acquisition of demilitarized zones, all to end the high transaction costs that kidnapping were generating.

Of course, the FARC did not expect the stern refusal of Alvaro Uribe's government to negotiate, and that the length of time, sometimes thought about as an element in their favor, would turn into insurmountable *timing costs* for the organization, as we have pointed out previously. This analysis, of course, is static and reflects neither the complexity nor the real monetary value that kidnapping implied for the organization, and much less for society. However, it allows a glimpse into facts such as: the long duration of kidnapping, plus the refusal of the government to negotiate, together with the constant pressure of the national armed forces, and a strong investment in demobilization and reintegration programs, made the optimal impact level diminish.

The number of demobilized agents of the FARC increased sharply as a direct effect of their agency costs. Table 3 displays the demobilizations the FARC suffered during the 2002 – 2009 period, right at the time it had the highest number of hostages.

In terms of military rank and position within the armed structures, the Program of Humanitarian Attention to Demobilized People (PAHD) uses a classification of five categories for those who are already demobilized: commanders, privates, ideologists, militants, and specialists. Using these categories, this table shows that only 9% of the total demobilized between 2002 and 2009, had some position of power within the FARC. The bulk (6802) of the demobilized agents were classified as privates who only follow orders, and militia (4553) –these are generally urban based, live among civilians and do not wear uniforms–.

Table 3 - The FARC's Demobilizations by Military Rank

POSITIONS	2002		2003		2004		2005		2006		2007		2008		2009		2002 -2009	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
Commander	18	3.4	117	8.5	123	9.5	97	8.6	93	6.0	179	7.2	398	13.1	211	12.4	1236	9.4
Privates	482	91.1	990	71.9	834	64.2	610	53.7	750	48.1	878	35.4	1341	44.3	917	54.1	6802	51.9
Ideologists	3	0.6	18	1.31	4	0.3	9	0.8	6	0.4	7	0.3	23	0.8	1	0.1	71	0.5
Militians	21	4.0	218	15.8	293	22.5	379	33.4	661	42.4	1334	53.8	1130	37.3	517	30.5	4553	34.8
Specialists	5	0.9	33	2.4	46	3.5	40	3.5	48	3.1	82	3.3	135	4.5	50	3.0	439	3.4
Total	529	100	1376	100	1300	100	1135	100	1558	100	2480	100	3027	100	1696	100	13101	100

Source: Arias, Herrera and Prieto (2010)

This same information is presented differently in Table 4. Even though the highest figures of demobilized is for those who surrendered with less than 5 years in the ranks of the guerrillas, it is also important to note that during the last three years, the number of demobilized who had been in the FARC has risen since the year 2002.

Table 4 - Time Spent on the FARC

Time spent on the FARC (years)	2002		2003		2004		2005		2006		2007		2008		2009		2002-2009	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
0-1	419	79.2	338	24.6	213	16.4	174	15.3	287	18.4	476	19.2	165	5.5	93	5.5	2165	16.5
1-3	27	5.1	429	31.2	486	37.4	384	33.8	401	25.7	658	26.5	332	11	357	12	3074	23.5
3-5	61	11.5	380	27.6	293	22.5	227	30.0	338	21.7	438	17.7	939	31	329	19.4	3005	22.9
5-10	17	3.2	178	12.9	248	19.1	281	24.8	413	26.5	686	27.7	1067	35.2	621	36,6	3511	26.8
10-15	5	0.9	45	3.3	51	3.9	56	4.9	104	6.7	178	7.2	418	13.8	249	14.7	1106	8.4
16-40	0	0.0	6	0.4	9	0.7	13	1.1	15	1.0	44	1.8	106	3.5	47	2.8	240	1.8
Total	529	100	1376	100	1300	100	1135	100	1558	100	2480	100	3027	100	1696	100	13101	100

Source: Arias, Herrera and Prieto (2010).

Comparisons between Alvaro Uribe's two terms of government –with a strong investment in the demobilization program– indicates a rise in the number of demobilized, who had been with the FARC for a period of between ten and forty years. If, in 2003, this group represented 3.7 per cent of the demobilized total, by the year 2008 this same group represented more than 17 per cent of the demobilized total. This explains a qualitative shift in the demobilization process, to the detriment of the FARC.

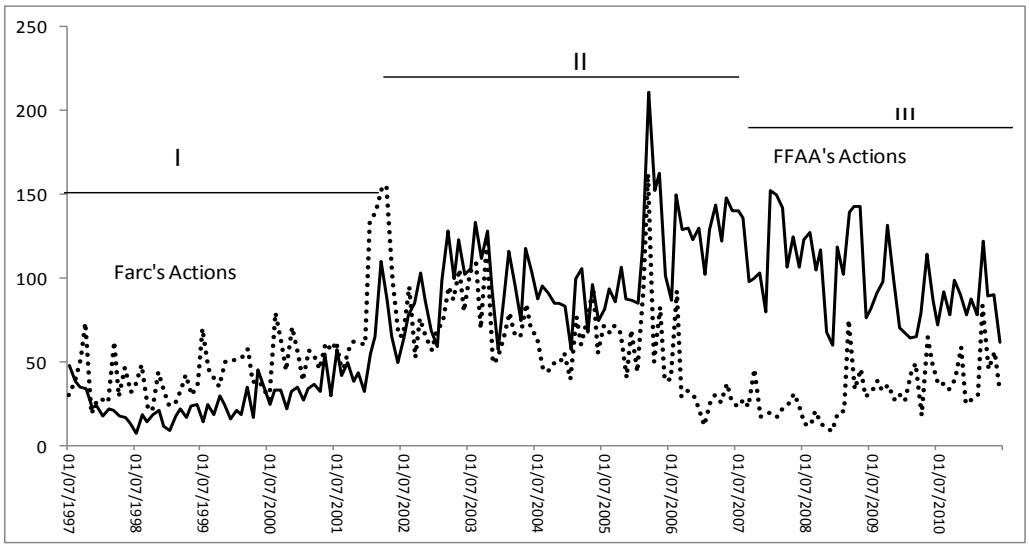
As the Colombian government maintained a firm stance against the FARC, this armed organization proceeded to gradually release some of their hostages. Our belief is that the FARC clearly preferred to release the hostages, receiving nothing in return, rather than pay the high transaction cost of holding those people in captivity. Such costs were reflected in the FARC's low effectiveness of its military operations, in its reduced capacity to launch military

attacks and in a high number of demobilized agents. In general, for Leech (2011), the FARC's strategy of using its political prisoners and captured enemy fighters as pawns at the negotiation table has been a failure:

In fact, there has only been one prisoner exchange between the FARC and the government in the rebel group's more than four decades of existence. In 2001, the FARC released more than 242 police and soldiers in return for the liberation of 15 sick guerrillas. It is difficult for the FARC to argue that the political and tactical gains that resulted from this prisoner exchange offset the public backlash the rebel group has endured in response to its practice of holding kidnapped political figures and captured government troops in the jungle camps for years (LEECH, 2011, p. 110).

Figure 10 displays an action diagram for the FARC and the Army from 1997 to January 2011. The dotted line shows the evolution of the FARC's actions, which include the sum of ambushes, attacks on military installations and attacks on communication infrastructure. The solid line shows the Colombian army military actions. This diagram was divided into three stages (ECHANDÍA, 2008, 2011). In the first stage (I), from 1996 to 2001, the FARC decisively hit the state security forces and the balance of forces was not favorable to the state. During this period, most of kidnappings carried out by the FARC were to achieve its strategic and political strengthening.

Figure 10 - Relation between Combats from Colombian Armed Forces (FFAA) and the FARC'S Actions



Source: Elaborated by the author from information supplied by Echandía (2013).

The future negative effects for the armed organization as a result of high transaction costs, becomes apparent in the aftermath of political kidnappings. The quantity of men dedicated to hostage custody decreased its military initiative and the fronts, which were directly responsible for hostages, went on to take a more defensive stand.

As pictured in Figure 10, in Stage II, from 2002 to 2007, the FARC attacks were exceeded by the Colombian army's military operations, in spite of its actions having increased in relation to the previous stage. During this period, eighteen of the hostages that the FARC considered "exchangeable"[23] died in captivity.

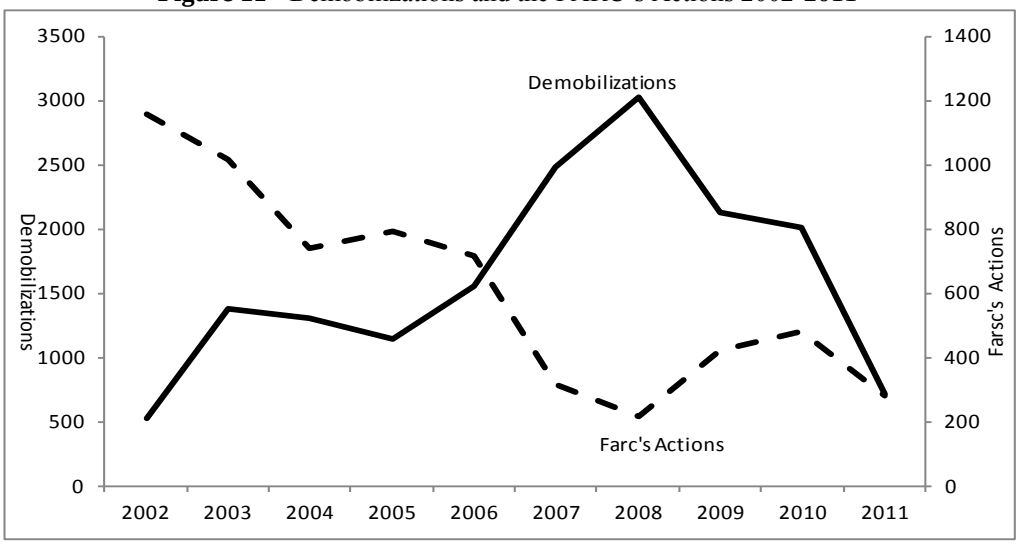
In Stage III, from 2008 to 2011, the FARC changed its strategy and started to free the political hostages in its power, repeating its demand that a demilitarized zone be created where talks about prisoner exchange could take place. In this final stage, according to official statistics, the FARC also suffered a series of setbacks. The Colombian security forces captured or killed a number of mid-level FARC leaders, –including three Secretariat agents in 2008– continued to debrief deserters for detailed information on their respective units, and reduced the amount of territory where guerrillas could operate freely.

By comparing the evolution of the FARC's military activity with the demobilized data in from Figure 10 below, it is possible to note that for the period between 2006 and 2010, there was a strong, direct relationship among three visible events:

a) a low capacity to launch attacks;
b) an operative desertion in massive numbers and;
c) a high number of hostage liberations (Table 2), perhaps the most critical stage for the FARC. The first two events would appear as reasons that triggered both the third one and the sudden decision of giving up its decades-long policy of kidnapping as their war strategy.

[23] Police, soldiers or politicians they held, hoping to swap them for imprisoned rebels.

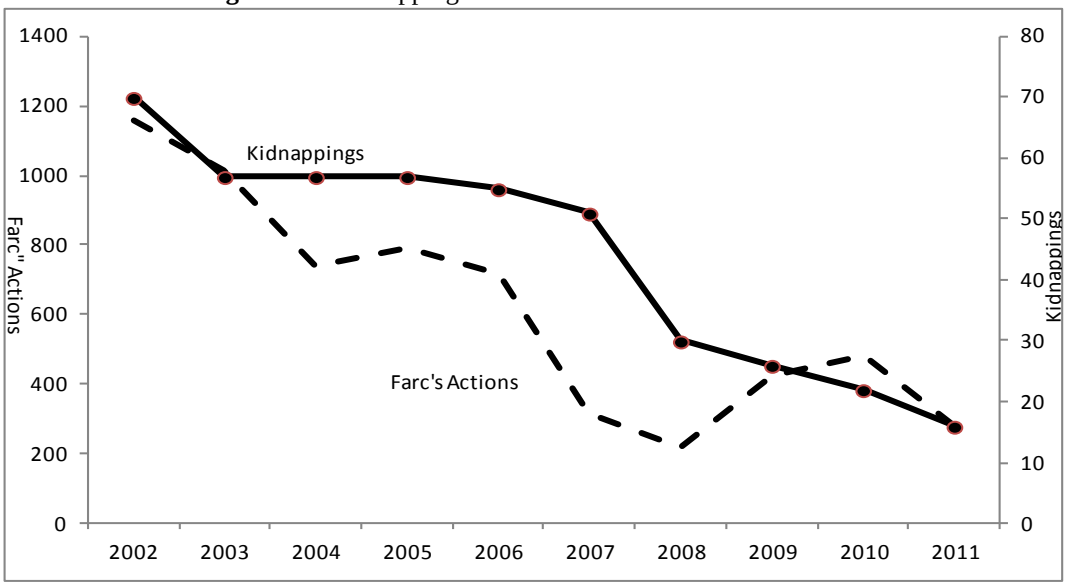
Figure 11 - Demobilizations and the FARC's Actions 2002-2011



Source: Elaborated by the author from information supplied by Echandía (2013).

As the number of the FARC's actions fall, the number of demobilized from the FARC's ranks grow. The observed correlation between two variables for 2002-2011 was r = -0,65 which is significantly ($\rho<0.05$) different from zero. In other words, the relationship existing between these variables is statistically significant.

Figure 12 - Kidnappings and the FARC's Actions 2002-2011



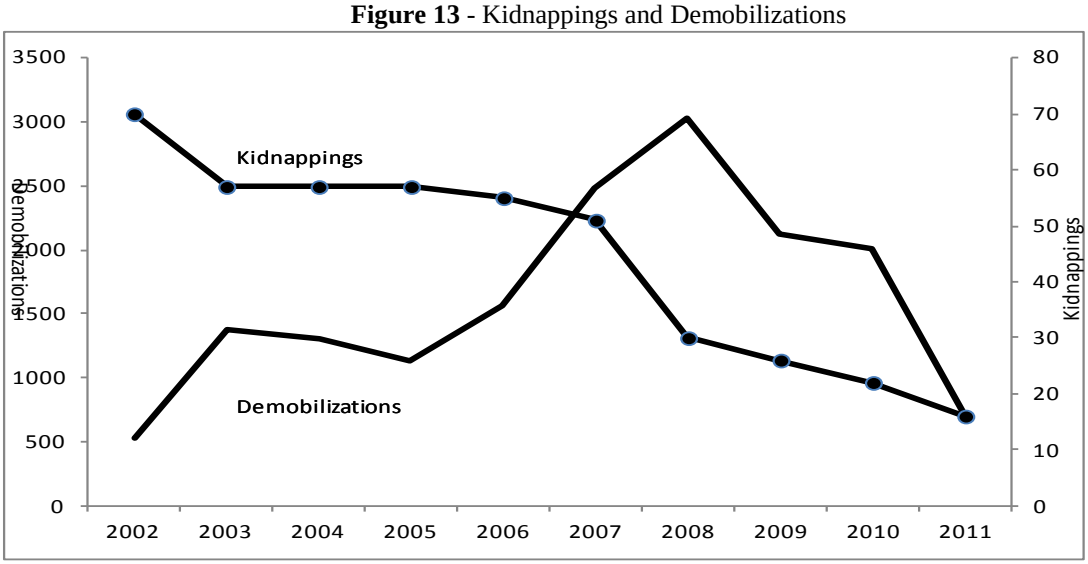
Source: Elaborated by the author from information supplied by Echandía (2013).

Figure 12 shows the evolution of kidnapping numbers and the FARC's actions for the 2000-2011 time periods. As can be seen in this Figure, that impetus the behavior of the

FARC's actions can be a result of kidnappings. During the 2000-2007 this organizations held almost the same number of hostages. Obviously, this implied a big deployment of their agents in order to ensure the hostages were kept alive while the agents endured strong pressure exerted by the Army. This greatly accelerated the decline of their military actions. Between 2007 and 2011, the Army rescued 17 hostages after 12 had been killed by the FARC. As a result, FARC agreed to release the rest of their hostages. In this period, that organization unilaterally released 17 hostages. All other hostages were freed some months later. From a statistical point of view, the correlation between two variables was r = 0,80 which is also significantly ($\rho<0.05$) different from zero.

The Figure 13 displays the relationship between kidnappings and demobilizations during 2002-2011. Between 2002 and before 2007, the number kidnappings remained nearly on the same level as in 2003. In this time, the number of demobilizations grew rapidly until 2008. The killings of 12 hostages in a friendly-fire exchange between two the FARC's fronts and the rescue of 15 hostages by the Army, decelerated the growth of number of demobilized. This was perhaps the result of greater control and monitoring of the FARC leaders over agents. Finally, in 2010 the unilateral liberation of hostages by this organization led to a decrease in the number of demobilized agents over the following year.

Figure 13 - Kidnappings and Demobilizations



Source: Elaborated by the author from information supplied by Echandía (2013).

The exodus of the FARC's agents has produced a vicious circle for this organization. Demobilized agents often provide invaluable intelligence for army operations, where some leaders and cadres of the FARC were captured, who were responsible for planning,

conducting the kidnapping[24]. As the military strikes more blows against the FARC; more agents lose their will to fight.

Additionally, not only the escape attempts, the successful liberation of hostages, tactical errors by guerrillas, plus the constant persecution of the Army, generated a wearing down of the organization in its military, political and media aspects. The exposure of the FARC while attempting to establish peace talks with representatives of other countries interested in the liberation of their own nationals (Ingrid Betancourt and the American contractors), and from the families of the hostages, revealed an organization which could be permeated without much difficulty. The constant communication with those who were trying to mediate in the liberation of the hostages and the exchange of information made it easier to find out some details of the organization that were unknown until then. In some cases this information enabled establishing the geographical location of its operational units, as well as the way in which the FARC's units, or fronts move on the ground[25].

2.6 How did the FARC resolve their agency problems?

Shapiro (2007, 2008, 2013) poses some strategies, in the case of terrorist organizations, that may be effective in order to solve their agency problems. This refers to contexts where the preferences of leaders and agents are not completely aligned due to information asymmetries and where agents can take advantage of the situation to act as they prefer, showing an opportunistic behavior.

In the first place, the leader of the organization must designate a sizeable amount of their resources to address oversights and monitor his agents, shaping the strategy of engaging

[24] See Castro (2012).

[25] Other acts, in the military field, can be registered as those in which there was a direct participation of demobilized guerrillas (and informers) and which were harmful for the organizational structure of the FARC. Among them we can point out: (1) the military operation in which Raúl Reyes, a member of the secretariat, was killed. (2) The "Jaque" Operation in which Ingrid Betancourt was liberated together with 11 other people and which has been previously mentioned in this study (ECHANDÍA, 2008). (3) The Isaza case, in which a demobilized guerrilla escaped with Congressman Oscar Tulio Lizcano. (4) The case of Ivan Ríos, another member of the secretariat, killed by his security chief. (5) The demobilization of Karina, ringleader of the Frente 47, that operated in the area of Antioquia, one of the most economically developed of Colombia. (6) Alias "Bruno", in 2008, who became a demobilized guerrilla while being part of the security ring of Mono Jojoy. The information provided by Bruno to the authorities, helped to weaken the safety devices of the guerrilla Operative. (7) The capturing of Martín Sombra, in the city of Machiqué (Venezuela), who had belonged to the organization for the last 35 years. His role was to train the Operatives of the guerrilla fronts. (8) An army raid, in 2008, that killed the FARC spokesman and No. 3 leader, Raúl Reyes, was based on information provided by a rebel turncoat. And (9) A few days later, Ivan Ríos's bodyguard, a member of the FARC's ruling secretariat, pulled off a mafia-style hit job. He executed his boss with a shot to the forehead, cut off his right hand as proof, and then turned himself in to the army to collect a $2 million reward.

the enemy in battle. In the second place, the leaders must provide compensation based on additional economic incentives; and provide the payment for services, depending on the results obtained by the organization, for example, making a successful attack. Third, the leaders can design strategies for exemplary punishment when evidence of *shirking* or evading responsibility is revealed.

Known evidence suggests that the FARC has indeed taken similar steps to those revealed by Shapiro (2007, 2008, 2013). Their solution was to create a more severe punishment system[26], increase the rotation of the agents guarding the hostages and invest more resources in monitoring their agents. In the short run, the FARC prohibited close contact between hostages and agents so as to pre-empt any permanent relationship, which could bring about negative effects for the organization's long-term goals. However, this rotation mechanism in the long run increased the costs, since new men had to be removed from their combat duties and given vigilance duties, guarding the prisoners, thus further exacerbating their discontent. The end result was the expression of this discontent which resulted in alliances or reprisals against the hostages, and generated more punishments and more rotations.

The size of the various punishments was associated with the mistrust that existed among the guerrilla fighters creating the conditions conclusive to striking dangerous partnerships with the hostages. Although there were privileges for those who obeyed the orders of the organization, the punishments were severe and it was on the punishing side that the agents and guards centered their control. On the other hand, the FARC encouraged distrust among the lower ranks of the structure. That is to say, any comrade could be a traitor, or could be an infiltrate, and this constant atmosphere of ongoing suspicion made everyone take on the role of watchdog of the others. One of the most famous hostages, Ingrid Betancourt, describes that process:

> Politician. I was the word that contained all the class hatred with which they were brainwashed daily. Indoctrination was one of the commander's responsibilities. Each camp was built on the same model, and each featured a class room where the commander communicated and explained his orders, where everyone was expected to denounce any nonrevolutionary attitude displayed by their comrades. They risked,

[26] 1. Dig trenches; one meter fifty deep and a meter wide for air raids. 2. Carrying wood, twenty, fifty, a hundred loads of wood. This punishment that could last fifteen or twenty days. 3. The "ranchas". The "rancha" is the kitchen. Everybody cooked except the chief – that was one of the privileges they had. The punishment was to have consecutive shifts, five or ten consecutive days cooking. 4. The most serious penalty was death. Death penalty was applied for treason to the movement, infiltration, trying to escape, complicity with the enemy, rape of a female guerrilla or women of the civilian population (PÉREZ, 2009, page 180).

> if they failed to do so, being considered an accomplice, being brought a court-martial for sentencing and being shot (BETANCOURT, 2010, p. 23).

Of course, this facilitated the control for the leader of the organization over the agents at the prison camps. However, although this solution could reduce the problem of asymmetric information, since it was possible to monitor the actions of the agents and give incentives to those who informed about misconduct or misbehavior against the objectives of the organization, it did not diminish the moral hazard problems that were starting to appear. What it did accomplish was to increase even more the agents' probability of desertion.

Nonetheless, many of these control and monitoring strategies, have generated vulnerabilities that are made evident through a higher number of desertions and, thus, in information leakages which have facilitated the capture and killing, in some cases, of the FARC's top leaders, since it implies a higher level of communication with the leader and a greater violation of the operational security conditions.

Monitoring agents can be exceedingly costly because it requires additional communication and record-keeping, which thereby increases the risk of death or imprisonment for everyone in the group (SHAPIRO, 2013). Leaders of The FARC, for example, have used logbooks, guerrilla diaries and digital files to check up on their agents, as illustrated in material seized by the Army in 2004. In that material there were reports which revealed the structure and internal organization for those who were involved in the direct care of hostages. The captured materials also revealed the conditions in the places for the detention of the hostages, the eventual classes in English and French that the hostages took, mandatory schemes in which the radios and televisions when they heard overflights, compasses handling when traveling, and a detailed list of medicines and surgical treatments made to the hostages and guerrillas who guarded them[27].

The end result of creating a more severe punishment system is risky was more repression, less incentives, encouraging the punished individuals to take decisions against the organization, and creating more incentives to desert. Shapiro (2013) explains the same for terrorist organizations. He argues that severe punishments can be costly and risky. In that organizations, agents can defect to the government and/or they can attack the leaders, physically, politically, or both.

[27] That material is being used in pretrial investigations from the Prosecutor's office in criminal cases, where Eli Mejia, alias Martin Sombra, a veteran rebel captured in 2008, was involved and who has been identified by authorities as the FARC jailer. Mejia was only obeying orders of Manuel Marulanda and Mono Jojoy, the FARC leaders (EL ESPECTADOR, August 17th, 2013).

2.7 Conclusions

Two main effects came out of the FARC's decision to turn political kidnapping into a long-run strategy:

a) the emergence of a mismatch between leadership interests and;

b) agent interests and the relationship between hostages and agents.

Such factors were crucial for this AIO, which decided to give up the kidnapping as its permanent criminal activity. The delegation of tasks related to kidnapping to agents who preferred activities with short-term results as the combat, led an agent's opportunist behavior in detriment of the principal's interests.

Considering the FARC as any legal organization and understanding its managerial challenges are actually quite similar to those face by other, more conventional organizations, this essay identified the transaction costs of kidnapping under the principal-agent approach.

The high transaction costs of that criminal activity, expressed through its high execution costs, were unbearable for the organization. By using the analytical elements of agency theory and a transaction cost scheme from Williamson (1981a, 1981b, 1979), and interpreting political kidnapping as another economic activity (SHAPIRO, 2013), this essay analyzed the effects of political kidnapping, on the relationship between leadership and agents of an AIO, providing a breakdown of transaction costs for that activity for both types of individuals.

The principal-agent approach was particularly attractive to treat this type of problem. This was useful because introduced the dilemmas faced by organizations when they decided to substitute their main activity for activities alien to their core beliefs and values as an illegal armed organization.

The contribution of this essay is to explain behavior patterns and strategic outcomes that cannot be understood from the point view of the organization, but that become transparent when seen through the perspective from the economic theory of transaction costs. We showed that the FARC decided to abandon political kidnapping as a result of the high transaction costs involved in that criminal activity, which were divided into variable and fixed costs. In turn, variable costs were broken down into opportunity and execution costs. Execution costs related to captivity time of hostages, which were defined by two types of costs: interaction impact and timing costs. The first one was equated with the cost of

kidnappings when in the give-and-take process between government and the FARC, none of the parties was willing to compromise on its position, making waiting seen endless and increasing the uncertainty for both parts. Timing costs reflected the effect the long duration inherent in kidnapping deepened the interest divergence between leadership and agents because they had a different point of view about their political impact and the risks inherent to it. Given that the timing costs were assumed to represent such separation of interests between principal and agent then their decisions were considered to be *trade-offs* between different kinds of costs like monitoring costs, bonding costs and residual loss (GROENENDIJK, 1997).

Therefore, the FARC's long run strategy generated two effects. First, a conflict of interest, between the leader, in charge of de signing action strategies and assigning tasks, and the agents responsible for the execution of such tasks. The divergence arose due to a change in the expectations of the agents, who preferred activities related to combat proper than those linked to kidnapping activities. As the uselessness of guarding hostages was revealed to agents, together with the increasing risk to their survival, both as individuals and as a collective organization, ending the activity emerged as a viable and efficient way out.

Secondly, in a noisy context and with latent security problems, the direct control and monitoring of the agents' effort proved to be a very ineffective strategy, not even performing the basic objective of revealing whether the agents were fulfilling the tasks delegated by the principal. In legal organizations, the principals can partially solve this problem by paying the agents a higher salary in order to extract the best possible effort. However, for an organization such as the FARC, this alternative was not viable, since they considered that those who decided to become agents should have an ideological commitment far above any economic incentive. Even though this might be true, there were still two factors, key to understanding the strategic situation of the FARC's decision to put an end to political kidnapping and undertake the unilateral surrender of all hostages.

That conflict of interests between the top leadership and the rank and file introduced additional impact and timing costs, and affected their internal cohesion, with irreparable effects to their organizational structure. On the other hand, the refusal of the government to negotiate, plus its strong investment in demobilization and reintegration programs for the agents of the armed groups, helped in the demoralization of the troops and in the increase of the probability of desertion of some of its field agents.

3 ESSAY II: A DISCUSSION ABOUT AGENTS' PREFERENCES IN THE CONTEXT OF AGENCY THEORY

This essay discusses why some agents' interests deviate from the principal's interests in the AIO after they have entered the organization. This deviation might be related to a swift in the agent's preferences due to changes in their relationship as the principal's new decisions were not welcomed by the agents. It also might be due to the emergence of external factors or new information related to new life conditions which could be perceived in a different way by the agents. If agents have preferences which are an essential and vital part of their membership to the AIO, it is clear that any preference change will involve a self-assessment of their role in the organization and could result in a decision against the principal's interests.

This essay is offered as a preliminary contribution to show how the principal's decisions in a hierarchical organization affect the settings in which agents define their preferences, by using three different approaches from economic theory:

a) a change in the risk;

b) a divergence of preferences both underlying and induced;

c) the presence of motivationally salient dimensions.

Given the difficulty of collecting reliable data on agent and principal preferences within those covert and illegal organizations, we obtained evidence to develop our analysis from reports related by people who were kidnapped by the FARC for political purposes (BETANCOURT, 2010, GONSALVES; STANSELL; HOWES, 2009, LÓPEZ, 2011, SAMPER, 2013) and their relationship with their jailers.

In this regard, there is a recent emergence of a wide array of literature on terrorist preferences. Strategic models have been develop in which the terrorist organizations are assumed to be unique agents which make rational decisions (ABRAHAMS, 2008), or in which how organizations like Al Qaeda would select targets within the US (LIBICK; CHALK; SISSON, 2007), or studies which try to identify the objectives of terrorists (KEENEY; WINTERFELDT, 2009).

We are more interested in studying the illegal organizations made up of a leader-principal and agents, specifically to study the agents as individuals who experience different goals from those of their leaders (SHAPIRO, 2007, 2008, 2012, 2013).

In covert organizations, like terrorist groups, relationship changes between principal and agent are normal and may be also a direct result of its hierarchical structure, wherein delegation and the benefits of delegation are an important factor, where the principal makes a

decision without prior consultation and, the agent accepts it without discussion from a restricted set of alternatives (HOLMSTRÖN, 1977, LUPIA, 2001). In this setting its secret and illegal nature could deepen the problem of interest divergence because agents can take advantage of the situation to act as they prefer, rather than as their principals would like (SHAPIRO, 2013, p. 26). Leaders' organizations can have well-developed mechanisms or institutions to alleviate how that situation affects all of their agents. For example, the principals delegate certain tasks because they acknowledge that agents have better information or autonomy about how tasks can be performed, and about how actions relate to outcomes. In such instances the delegation of tasks is successful even if their preferences differ significantly. The organizations also engage in monitoring agents. However this can be costly when it rises above a certain threshold since it increases the risk of negatively affecting everyone in the group.

To illustrate this concept, we analyze the case of the FARC and its agents. The FARC is considered to be a subversive organization rooted in the peasant population with a high propensity combat operation.

The FARC faced a high desertion rate of agents during 2002-2010, data never before reported; after having been an organization characterized by its strong internal cohesion (MATTA, 1999, OFFSTEIN, 2003, PÉCAUT, 1997). About how the FARC worked as an economic war machine, Gutiérrez (1999, p. 10) explained:

> FARC's top management (Secretariado) establishes mandatory financial goals to be fulfilled by the regional entities (Frentes). All money is centralized, and then it is redistributed according to normative (trying to maintain a balance between rich and poor Frentes) and military criteria. This system –plus the fact that promotion might be associated with the fulfillment of the financial quotas of the Secretariado – has proven stringent and effective, and has forced the leadership of the Frentes to develop their economic imagination [...]

With respect to control over the Fronts:

> The Secretariado (leadership) maintains a tight control over the Frentes (Fronts) and over individual agents who are in charge of financial affairs. The rationale behind this is evident:" "The only relatively serious splits that the FARC has suffered in its long history come from people who have abandoned the organization with a handful of dollars. Typically, their following has been from tiny to negligible. FARC leaders are highly aware that a luxurious life style and the enjoyment of pantagruelic (sic) rents can not only undermine the organization's cherished unity, but also slacken its combativeness. Thus, strong bureaucratic and normative constraints are imposed over the militants, especially those who are more exposed to temptation. But this brings us to the general frame of the institutions developed by the organization, that constitute the immediate set of incentives and constraints for its members (GUTIÉRREZ, 1999, p. 11).

With respect to control over agent's life:

> The FARC had control over every aspect of the guerrillas' lives –including what passed for romantic relationships. Though we saw a lot of promiscuity and swapping of mates.." "…Because they had so little command of their own lives and made so few choices for themselves, we were just about the only things that they could actually control. Even though they were never able to control us completely, the need to assert themselves over us had a lot to do with their cruel and arbitrary treatment. Knowing this didn't justify their actions, of course, but it did help explain them [...] (GONSALVES; STANSELL; HOWES, 2009, p. 278).

For many years, the FARC were able to control and maintain the discipline of the group despite occasional cases of desertion that were nevertheless critical for the organization's structure. The FARC considered their agents had infinite preferences and without additional compensation would perform any task that was assigned to them. However, the increases in the desertion rate in a certain period –during 2000s– began to indicate that some agents were disappointed with the new tasks related to the new targets or political goals of the FARC's leadership: i.e. political kidnappings and their long duration. The FARC leadership's theory was that once agents decided to enter the organization, their identity as an individual agent would be replaced with by their identity with the group. This allowed the FARC leadership an ample room for making decisions and assigning tasks. They also assumed that initial motivations and risks associated with membership in the organization would remain constant over time. Evidently, the FARC never thought the importance of interaction of motivations, risks and rewards would result in some agents reaching a risk threshold beyond which they would not go. They should have foreseen this possibility.

For a long time, as Mccormick (2003) states concerning some terrorist groups, the FARC's leadership did not consider the potentially discordant views of the world but assumed there would be a unitary agent group, defined by a single, stable, and ordered set of preferences, which would be able, with a single mind, to identify, evaluate, and make decisions among competing options. The FARC's leader assumed that his role was to identify the goals and operating constraints, to assign tasks and then pick the available courses of action that offered the highest expected return. The agents' function would be to accomplish the tasks in a way most favorable to the goals of the FARC leadership.

We are not focused in hostage-taking or kidnapping scenarios where armed organizations attempt to negotiate with the government in order to get concessions as was presented by Sandler, Tschirhart and Cauley (1983) although the effects of failed negotiations

between Government and an AIO are incorporated into this analysis. Primarily we will focus on the reasons why agents' preferences eventually depart from the principal's interests and the simple causality between the principal's decisions and the high desertion rate of some agents.

We will outline three different ways of addressing this same problem. The first is taken from Phillips and Pohl (2013) who see the preference problem as a change in the risk for the agents. The second approach comes from Shapiro (2013) who presents the problem as a divergence of preferences both underlying and induced. The third outlook from Dietrich and List (2011) formally states that such preference changes are due to the presence of motivationally salient dimensions, in which alternatives are modeled as points in some multidimensional space and, only some of whose dimensions play a role in shaping the agent's preferences. Although it is quite illegal common for organizations to suffer these kinds of principal-agent conflicts, in the case of the FARC, they were not able to handle them in a timely manner. Their leadership believed that political kidnapping would be successful actions similar to kidnappings for ransom. However, such action had a relatively higher expected payoff, and risks, than other their criminal actions of the past. The expected payoff hoped to include the garnering of media coverage, more recognition of their political *status*, release of prisoners, and changes of government policy. However, their agency's problems were capitalized upon by the government by increasing military pressure and refusing to fully engage with the organization. Through these tactics the government gained significant political advantage. The end result showed that the FARC had failed in its political kidnapping policy. One of the hostages gives the following account of conversations with the guerrillas:

> Even the guerrillas said, many times, that basically they did not agree with the practice of kidnapping, and they did not share the fact that we were suffering in this situation. Among other things, because kidnapping was contrary to the postulates of Jacobo Arenas, the ideologue of the FARC, who wrote several articles for the FARC's booklets, in which he transparently, manifested his total repudiation of kidnapping as a political practice, and more as a way of financing the war (PÉREZ, 2009, p. 178).

> […] There was never the potential mass mutiny, but here were several occasions when the guerrilla opened up and said something that explicitly revealed the level of discontent among the ranks [...] But as far as we could tell, there was widespread questioning of purpose and a dislike for this duty. On the forty-day jaunt after Caribe, we saw that the guerrillas didn't like the forced marches any more that we did. Now that seed of discontent had blossomed (GONSALVES; STANSELL; HOWES, 2009, p. 258).

Perceptions derived from the above are that some commanders (agents) disagreed with the practice of kidnapping. These perceptual differences between the leadership and agents as to the rationale, the process and the procedures were undoubtedly increasing with the passing time.

3.1 Risks

We are aware that eliminating risk preferences or where risk neutrality is assumed leaves us with one less thing to worry about. However, we assume that, in the context of illegal organizations, the type of tasks imposed by the leader upon agents could shape the agents' risk preferences and exacerbate agency problems inside the organization. More specifically in the case of the FARC, Gutiérrez (2008) shows that when the FARC's agents had combat tasks assigned, extortive kidnapping and armed assaults –which were activities with short-term results– the rate of desertion was low. But when the FARC turned to political kidnapping the number of deserters from the FARC's ranks grew. It's only from 2002 that begin to have record of that phenomenon due in part to Colombian government-led Program of reintegration for guerrillas. However, if the agents' interests were aligned with the leader's interests, what explains why some agents changed their thinking?

We will follow an analysis similar to Phillips and Pohl (2013), which explores the ways in which concession or incentive schemes alter risk-reward *trade-off*, and which features the terrorists' expected payoffs. Their analysis also identifies important relationships between risk preferences and the nature of concessions or incentives. However, we will focus on the agent's preferences shaped by the delegation of tasks under the leader-agent relationship.

The scenario for our discussion is the emergence of agency problems. We assume that the thrill of combat is the principal motivation for those that join and stay in an AIO. This follows the study of Gutiérrez concerning the behavior and motivations of the agents within the FARC's ranks:

> This gives us a general picture of the organization-individual gap in the Colombia war. Take the FARC, with its strong links to criminals. Its non-paid members (18-20,000) are participating in a conflict in which they have a fair probability of getting killed. They do not benefit from looting. Becoming rich is not a realistic perspective, and this is common knowledge. The organization severely intervenes in all the domains of their life. The FARC's time horizons are long, because, very wisely, it has refused to offer a more or less precise notion of when victory, or the termination of war, will arrive- its patience is proverbial, and a powerful tool in peace bargaining. This is "metaindividualistic" patience indeed, a life time might not be sufficient to attain the collective goals (however we describe them). No

> extraordinary income (or ordinary, for that), thus, no family life, and no credible expectation for escaping war. No ethnic or religious glue, either, nor a big doctrinarian build up. Despite this, The FARC's members generally fight with great verve. There are exceptions, but as a rule their behavior in combat exhibits both skill and motivations against opponents endowed with better technical means. When on the defensive, they do not fall apart, and only on the margins does the group suffer defections (GUTIÉRREZ, 2008, p. 14).

Until recently, the FARC looked like an organization with strong intern cohesion, where agents' interests seem to be aligned to the leader's interests. But, the cohesion appears to have been weakened with the adoption of political kidnappings, reiterating our position that combat was more attractive than other activities for the agents. In this spirit, agents joining the FARC showed a preference ordering and inclination for combat rather than any criminal activity. Given that results from that criminal activity were uncertain, those preferences could be read as preferences about lotteries. That is, in probabilistic terms, each clash between the army and any armed organization always had two possible results and a probability associated to them: win or lose. The combatants might as likely be seriously injured, killed or caught; or be winners.

Before each confrontation, there was an associated probability of results, by which agents calculated a payoff that they expected to obtain. As Phillip and Pohl (2013) argue, payoffs may be still a matter for discussion but they can include some or all of the following: the infliction of fatalities to the enemy, more territory gained, the seizure of weapons and ammunition from enemy, or winning a promotion. Therefore, agents faced some expected payoff scheme characterized by a *trade-off* between risk and reward. The agent's assessment of a compensation package depended upon several factors, like his position in the AIO, and the degree of risk aversion associated with the activity. Given that he had accepted the terms of the contract when he joined the organization, he also had accepted the risk and compensation level involved in the agreement. In formal terms, we can say that such an agent faced a convex compensation schedule that exhibits this relationship: the riskier the activity, the higher the possible reward.

But does it make an agent more willing to take risks? According to Ross (2004) little is known about the derived risk preferences of agents given common types of incentive structures. Therefore, we will take some first steps toward such an analysis by finding conditions under which an agent is willing to take more risky actions. We will assume a setting wherein illegal organization incentives tend to be inelastic in relation to the risks and in which incentives for different actions do not move in concert over time. More specifically, what are the effects on the agent's future decisions if there is a change in assigned tasks? How

do agents evaluate those new tasks? Does the armed illegal organization know how its do decisions can affect an agent's risk preferences?

The problem of a changing of assigned tasks for agents in an illegal setting must be approached by treating the effects of such change as something that alters agent's preferences. If a compensation plan for an individual agent going into the organization is characterized by a particular *trade-off* between risks and rewards, an alteration could modify the expected compensation in response to more risky actions. The combat action invoked an expected compensation for each agent since there was a relationship with the associated increased risk.

In comparing combat and kidnapping, we can say that, despite the fact that both activities have a random component, the results of combat could be affected by the agent's efforts more so than in kidnapping.

The kidnapping's results depended more on external factors such as negotiations between the organization and the government. Because of an agent's responsibility for the custody of hostages, his potential for combat activity was reduced. In fact the agent was often forced to flee a given combat confrontation.

Betancourt (2010) describes one of the several situations that she experienced in her captivity, which shows the constant risk of being caught or killed by the Army both for hostages and abductors.

> At two o'clock in the morning, I was violently awoken by one of the guards shaking me and shouting….." "Get up, bitch! Do you want to get killed?" "…Military planes were flying very low over the camp. The guerrillas were grabbing their backpacks and running away, leaving everything behind them. The night was pitching black, you couldn't see a thing except the silhouettes of the airplanes you could sense above the trees" "They only made the guard bleat all the louder 'Leave everything! They're going to bomb us, don't you get it' (BETANCOURT, 2010, p. 141).

In another camp, where one of the hostages relates:

> At first, I really didn't feel anything. All of a sudden, we felt the Army's helicopters fired several shots. They almost were flying over the treetops. -This way! Pick up what you can! Let's run away! This way! –The guards shouted. All the hostages and guards went into a panic. The rain, as always, hit us day and night. The guerrillas were very afraid and we walked at excessive speeds. We did not stop even for a moment. (SAMPER, 2013, p. 17).

These escapes were costly given the loss of camps that had been built and the necessity to find another secure place and to build a new camp. Guards and hostages were living in constant fear and anguish of being attacked by the Army. These kinds of situations

undermined the morale of the agents, making the relationship with hostages tenser, and subjecting them to acts of cruelty. One of the hostages tells us in his book:

> One has to get used to the chains, to be barefoot in the camps, not to use toilet paper and a thousand other things. But what affected me most was the humiliation, to which I never got accustomed (LÓPEZ, 2011, p. 42).

It is likely that the emergence of such problems would change the payoffs that agents expected from this type of activity. The enforcement of the new tasks might have affected the way agents saw the tradeoff between cost and payoffs. Only if the payoffs from the organization had been responsive to those changes that is, if the leadership was willing to increase payoffs, would it have been possible to alter the agents' risk preferences in a manner that made them more risk seeking. That is, the agents were willing to accept riskier actions involving more efforts if the payoffs were commensurate with the increased risks.

However, because there was little flexibility in the leader's compensation system, the disutilities generated by the new tasks were not quickly mitigated by new compensation systems, which led to growing discontent among agents. This is the perception of one of hostages about his abductors:

> The face of the guerrillas in general is morose and melancholy. They are sad and their faces also reflect a tremendous amount of anger and hatred which has been accumulated for years. Overall, their expression is of dismay or disappointment. They don't look like people who are involved in an enjoyable activity or job. On the contrary, most of them seem to be resigned. This is understandable since for many of them to be a FARC's member has been a goal in life, not a conviction but a unique way of life that promises three meals a day in a context of high risk, constant danger and yet, with the monotony and routine tediousness, and the unhealthy jungle (PÉREZ, 2009, p. 176).

Our hypothesis is that new tasks imposed by the leader without any payoff adjustment, made much concave the agents' utility function and makes the agent more averse to accept risk. The reason why those tasks increase the agents' aversion to risk and makes them less risk seeking is that the new activities raised the level of risk, to a higher level than they initially accepted. The problem is that even though agents were willing to take risks, these new tasks being more risky went beyond the level of risk initially accepted by the agents.

Now, for combat as we make this analysis we see a split develop between risks taken by the leader and the risks taken by the agent. The risks were not compatibles with the payoffs. That is, the payoffs were only commensurate with the risks originally assumed by the agent in such criminal actions. While the leaders waited for a ransom from the Government,

the agents waited for a reward from their chiefs. Unknowingly the FARC leaders assumed that their risk was comparable to that of the agents but in reality only the agents faced the greater risk of direct attack by government troops.

3.2 Underlying Preferences versus Induced preferences

Shapiro (2013) offers an explanation as to why the preferences of leaders and agents are not completely aligned. In terrorist organizations operational terrorists often have different preferences over targets than do their leaders. Because this they not only have different perceptions about the political impact of their actions but also different perceptions about how to use violence and about how to spend money. Despite high security costs leaders generally mitigate this conflict of interests by exercising greater control, or punishing operatives who misbehave. Unlike legal organizations, covert groups can face greater problems when tasks are delegated. However, the benefits of delegation are evident in instances where agents have better information or unique technical skills concerning a target.

In these cases, the leaders may be better off delegating to an agent. The disadvantages of delegation are linked mainly to strategic decisions which require numerous sources of information (BENDOR; GLAZER; HAMMOND, 2001, BENDOR; MEIROWITZ, 2004, LUPIA, 2001). In these instances when principals know more about how to accomplish objectives that their agents because they have more experience concerning political impact of certain actions and they know how to respond in the light of the current political setting. In order to explain such preference divergence between principals and agents, Shapiro (2013) distinguishes between divergence in underlying preferences and divergence in induced preferences. In his research about the terrorist's dilemma, Shapiro (2013) refers to preference divergence as a result of differences in induced preferences due to different underlying preferences, different information, or different beliefs (p. 29). The induced preferences are a function of underlying preferences which are determined first by, the information agents receive and, second, by the different beliefs about how to respond to the given information. Therefore, individuals who have similar underlying preferences can have very different induced preferences.

We agree with Shapiro's explanation which states that measuring preference divergence is more complicated than simply looking at observed levels of conflict. We see as

significant the hostages' reports which note tensions between those kidnapped and their jailers and how they were treated during captivity.

The US Contractors tell about their marches:

> […] Everyone had it bad, including the FARC. Once again we saw the lower-level FARC guerrillas being treated like pack animals. They carried heavy propane cylinders, cook stoves, and large bags of food. They ferried one load ahead, returned, and then set out again with another heavy load. (GONSALVES; STANSELL; HOWES, 2009, p. 232).

> […] Everyone did the best they could to help the others, but the FARC were suffering as badly as we were and they took out their frustrations on us (GONSALVES; STANSELL; HOWES, 2009, p. 233).

Or the presence of tensions between commandants and guardians:

> This was just one of several instances we witnessed when the underlying tension Milton (commandant) and the guards started to boil to the surface. There was a definite crack being exposed and we moved to exploit it a best we could. Lke us, a number of the FARc saw Milton for what he was –a simpleton and petty tyrant (GONSALVES; STANSELL; HOWES, 2009, p. 257).

Agents were directly responsible to their superiors for keeping hostages safe and alive. Their new role could lead to agents having have induced preferences different than their leaders. While for the FARC's leadership the hostages were a cherished bargaining chip, for others in the organization, the hostages represented the possibility of being captured or killed by the Army, or the possibility of being tried and punished by their own organization if they failed. This might be a clue that in these kinds of tasks, the delegation of certain responsibilities was not beneficial for all the organization, since agents were perhaps less skilled in the hostage custody responsibilities than the principals believed. Complicating the issue was the fact that hostages and agents were sharing the same spaces and same dangerous situations, which made the relationship between some of them close. On the other hand sometimes, the dangerous situations and close living conditions made the agents turn cruel and violent as well. In fact, the leaders had a strong interest in preventing the emergence of close relationships between hostages and agents. Their preventive strategy was to maintain a high rate of rotation among those who were guarding the hostages. Additionally, they encouraged agents to be rude and cruel with the hostages while they presented themselves as benevolent and kind.

Betancourt (2010) relates a conversation she had with Joaquín Gómez, one of the FARC's leaders when he was visiting her at the hostage camp:

> I told him everything we'd been enduring at the hands of these often cruel and insensitive men –the constant humiliation, the scorn, the stupid punishment, the harassment, the jealousy, the hatred, the sexism, all the everyday details that poisoned our lives, with the number of things Andres (camp commander) forbade us to doo increasing by the day, the absence of all communication or information, the abuse, the violence, the meanness, the lying. (BETANCOURT, 2010, p. 166).

And Joaquin Gómez answered:

> - "Don't worry. I'm watching over you. As long as I'm here, there are things that won't happen". "I smiled sadly. He was too distant and too high up in the hierarchy to really be able to protect me. He was an inaccessible to me as I was to him because of both the distance and the stubbornness of these subordinates. He knew this." (BETANCOURT, 2010, p. 168).

To show the differences in relationship and behavior which existed between leader and agents, refer to Table 5, which illustrates Betancourt's relationships with the agents (guards) and principals (the FARC's leaders) during her captivity. According to the hostages' accounts all camps in which they were also held captive had a hierarchical structure of command. Such structure consisted of a camp commander who was in charge of managing and controlling the camp, below the commander were the guards. Among the guards were the "receptionists" those who prepared the meals and made the beds, and the lower level guards, those who guarded the camp and hostages. The camp commander received direct orders from the FARC's leadership for operations and tasks to be carried out. They supposedly served as a bridge between the leadership and hostages but the leaders rarely visited hostage camps.

Table 5 - Types of Kidnappers

Hostage: Ingrid Betancourt was kidnapped in 2002 and rescued in 2008.			
	Leadership (Principal)	Guards (Agents)	
		Commander of the hostage camp	Simple guards (Custody) and Receptionists (meals)
"El Mocho" Cesar			
Leader of the FARC's 15th Front	Friendly		
Sonia:		Friendly-Hostile	
Ana			Hostile
Isabel			Friendly
María			Uneasy
Young Cesar		Friendly-Hostile	
Betty			Uneasy – friendly
Alexandra			Friendly
Patricia			Friendly-hostile
El Mico (The Monkey)			Uneasy
Andres		Hostile	
Jessica			Hostile-Friendly
Ferney			Friendly
Jhon Janer			Uneasy
Edinson			Hostile
William			Hostile
Andrea			Hostile
Joaquín Gómez			
Chief of the Southern Bloc and adjunt member of Secretariado	Friendly		
Giovanny		Friendly	
Mono Jojoy	Friendly		
Martín Sombra		Hostile-Friendly	
Martha			Friendly
Rogelio			Hostile-Friendly
Brian			Hostile-Friendly

Source: Elaborated by the Author from Betancourt's relates (2010).

Table 6 - Two lotteries and two dimensions

Hostage: Marc Gonsalves, Keith Stansell and Tom Howes were kidnapped in 2003 and rescued in 2008.			
		Guards (Agents)	
	Leadership (Principal)	Commander of the hostage camp	Simple guards (Custody) and Receptionists (meals)
Oscar		Uneasy	
Sonia			
Fabian Ramírez	Friendly (subordinate of Joaquín Gómez)		
Burujo	Friendly		
Joaquín Gómez	Friendly		
Mono Jojoy	Uneasy		
Martín Sombra		Friendly-Hostile	
Ferney		Friendly-Hostile	Friendly
Lapo			Friendly
Pollo (The Chicken)			Hostile
El Cantante (The Songster)			Friendly
Risas (Smiley)			Very Friendly
Rogelio			Hostile
Milton		Hostile	
Eliécer			Very Friendly
Cerealito			Friendly
Plomero (Plumber)			Friendly-Hostile
Efrén			Friendly
Alfonso			Friendly
Rogelio			Hostile
Ernesto			Friendly
César	Uneasy		
Enrique		Hostile	
Monster		Hostile	
Asprilla		Hostile	
Mario			Friendly-Hostile

Source: Elaborated by the Author from Gonsalves, Stansell and Howes' relates (2009).

It is possible to note that kidnappers varied in the manner in which they behave toward their hostages. It was not homogeneous or absolute. That is to say, between those kidnappers who mainly used multiple tactics to coerce their hostage and those who used a single or predominant manner of treating hostages in captivity (PHILLIPS, 2013). Using the analysis made by Betancourt (2010) and Gonsalves, Stansell and Howes (2009) after their kidnapping, we can create agent categories such as friendly, friendly-hostile, and uneasy; and friendly, polite-friendly, and educated-friendly categories for the principal.

The friendly-category represents those who more often treated them well, providing her with books, radios or TV. While the hostile category referred to agents, who often subjected them to acts to cruelty and humiliation like using a chain around their necks to prevent their escape.

The friendly-hostile category represents a situation in which initially they had a good relationship with their guard (agent) but later it became a difficult and conflict-ridden.

According to Betancourt (2010)'s and Gonsalves, Stansell and Howes (2009)'s version, the leadership was always attentive, helpful and willing to respond to hostages'

requests. While, on the other hand, the majority of camp staff tended to be indifferent or to have a position and attitude of confrontation with the hostages all the time. Thus table 5 illustrates the case of Ingrid Betancourt and US contractors, who experienced various and different treatments depending on whether the persons were agents or leaders.

In case of US contractors, they show a similar vision in regard to their guardians:

> […] In spite of all this, most of the time we were as thick as thieves. The Mud Camp's conditions, the cords and harnesses, the severe blow to our hopes of a quick release, all combined to really rub us all raw. Even when those disputes were at their worst, we were becoming close as brothers. We were seeing the guards as even more of an adversary that before. With the cords around our necks and being tied up, we became more dependent on them. We hated that and they hated that. If you had to pee, you needed a guard to come and untie you and take you to the trench. Sometimes they didn't feel like letting you go, so they wouldn't, for an adult to have to plead with someone to let you relieve yourself was incredibly demeaning. It seemed to be the FARC's intent to drag us down as low as they cold (GONSALVES; STANSELL; HOWES, 2009, p. 138).

That relates and previous tables show that a member's position within the organization hierarchy shapes the way the agents treat hostages. An agent's incentives and reason to mistreat hostages are inversely related to his stations within the organization. By definition, the principal carries more cloud within groups that their agents. Many of guardians tried to demonstrate the anger and upset by their hostages. Such agent's behavior can be interpreted as a hidden behavior no observed and no controlled by the principal.

3.3 A Change of preferences

What follows is an illustration of a change of preferences based on Dietrich and List (2011)'s model, which is developed in a non-informational context. Their model drives our study towards the analysis of the specific situation of the FARC from a formal point of view. Different from the mainstream rational choice theory, where any preference change over decision options is due to Bayesian information learning, the alternatives over which agents have preferences which can be characterized along several dimensions, some of which play a role in shaping the agent's preferences.

Dietrich and List (2011) call these the *motivationally salient* dimensions. When some of these dimensions become salient for the agent, his or her preferences can change and thus, her or his actions change. This is useful for analyzing and explaining the behavior of some

agents in the FARC. These scenarios are created when the leader delegates new task to the subordinates. This is what Shapiro (2013) calls preference divergence over tactics.

In case of the kidnapping, the FARC's agents experienced a kind of imprisonment, along with their hostages, whiles the combat activities with a loftier *status* and some degree of autonomy were relegated to a secondary level.

For instance, some motivationally salient dimensions could be triggered when the relationship with the hostages forced agents to undergo the same feeling of confinement as the hostages. In the Dietrich and List's proposal what happens when the agent's set of motivationally salient dimensions changes is that different dimensions attain force in shaping his or her preferences. There need not be any change in the agents' beliefs of the alternatives on those dimensions, or about anything else (DIETRICH; LIST, 2011, p. 3).

Formally, in that model the alternatives are represented by points in some multidimensional space and an agent orders his or her alternatives on the basis of a particular set of dimensions that have motivational salience for him or her. Thus, the agent's preferences depend on the location of the alternatives on the motivationally salient dimensions, but not on the locations on others.

3.3.1 The model

As we mentioned earlier, we shall base our example on Dietrich and List (2011)'s paper, where the authors analyze alternatives over which agents have preferences. These alternatives are examined in several dimensions, only some of which play a role in shaping the agent's preferences. This model is formally developed for the deterministic case. The authors do however; give guidance on how to incorporate uncertainty into their model. In order to do this, the model presented here considers the agent's lack of complete information as its starting point. Let a decision problem with ***n*** mutually exclusive possible outcomes or alternatives be shown as $X = \{x_1, x_2, \dots, x_n\}$.

Definition 1: A simple lottery over results $X = \{x_1, x_2, \dots, x_n\}$ is defined as a probability distribution $p = (p_1,\ p_2, \dots, p_n)$, where $p_i \geq 0$ being the probability of result x_i occurring, and $\sum_{i=1}^{n} p_i = 1$.

To be precise, it is assumed that the lottery chosen by the Nature is conditional on the action taken by the agent. Hence, given an action $a \in$ A, the conditional probability that a result $x_i \in X$ occurs is given by $p_{(i|a)} \geq 0$, and $\sum_{i=1}^{n} p_{(i|a)} = 1$ for all $a \in$ A.

Let *L(X)* denote the set of all possible lotteries. Each lottery $p_{ij} \in L(X)$ can be written as *j*-tuple $= (p_{i1}, p_{i2}, p_{id}, \ldots, p_{ij})$, with p_{id} representing the d^{th} characteristic of the lottery p_i on dimension *d*. In other words, *j*-tuple also can be written as

$$((p_{11}, p_{21}, \ldots, p_{n1}), (p_{12}, p_{22}, \ldots, p_{n2}), \ldots, (p_{1j}, p_{2j}, \ldots, p_{nj}) \quad)$$

It means that $(p_{11}, p_{21}, \ldots, p_{n1})$ is a lottery in the dimension 1, $(p_{12}, p_{22}, \ldots, p_{n2})$ will be the same lottery but in the dimension 2 and $(p_{1j}, p_{2j}, \ldots, p_{nj})$ in the dimension j, respectively.

Let $D = \{1,2,3, \ldots, j\}$ the set of dimensions. We can assume that *L(X)* is the form

$$L(X) = L(X)^1 \times L(X)^2 \times \ldots \times L(X)^j$$

Definition 2: A set of motivationally salient dimensions is a subset $S \subseteq D$.

A family of preference orders over *L(X)* is considered, consisting of one preference order for each possible set of motivationally salient dimensions. For each $S \subseteq D$, we will use the preference relation $\succcurlyeq_S$, which should be read as the agent's preference order in the event that *S* is the set of motivationally salient dimensions.

Following the common tradition in decision theory, we express $\succcurlyeq_S$ as complete and transitive. It can be also referred to rational preference relation on *L(X)*, and we assume that it is continuous. We will use the strict preference relation, $\succ_S$, and the indifference relation $\sim_S$ induced by $\succcurlyeq_S$. As is conventional, we assume that $\succcurlyeq_S$ is represented by the expectation of some utility function from *L(X)* into *R* (MAS-COLLEL; WHINSTON; GREEN, 1995).

Dietrich and List (2011) introduce three axioms on the relationship between an agent's set of motivationally salient dimensions and his or her preference order, in a setting where no uncertainty exists. We do that in a case where the agent is uncertain about what outcomes will result from his or her choices. Based on Dietrich and List (2011) we have:

Axiom 1: 'Only salient dimensions motivate.' For any two lotteries *p*, $q \in L(X)$ and any set of motivationally salient dimensions $S \subseteq D$, if $p_S = q_S$, then $p_S \sim q_S$.

Axiom 2: (simple variant) "Only dimensions on which there is a difference motivate." For any two lotteries *p*, $q \in L(X)$, any set of motivationally salient dimensions $S \subseteq D$ and any other dimension $l \notin S$, if $p \succcurlyeq_S q \nLeftrightarrow p \succcurlyeq_{S \cup \{l\}} q$, then $p_l \neq q_l$.

Axiom 3: (official variant) For any two lotteries *p*, *q* ϵ *L(X)*, and any set of motivationally salient dimensions $S \subseteq D$, if $p \succcurlyeq_S q \Leftrightarrow p \succcurlyeq_{S \cup T} q$, for every non-empty set $T \subseteq D \setminus S$ then $p_l \neq q_l$, for some $l \in D \backslash S$.

According to Dietrich and List (2011) those three axioms are used to make a correct specification of the motivationally salient sets. For example, in the case of Axiom 1, if the preference of one alternative over another one doesn't change for a given set of motivationally salient dimensions, this implies such set isn't shaping the agent's preferences. The second and third axiom takes care about the agent's preference between any two lotteries may change when one additional dimension motivationally salient is incorporated, only if those two alternatives differ on that new dimension.

Theorem (taken from Dietrich and List, 2011, p.22) *Suppose there are three or more effective dimensions in D. Then the agent's preference orders* $\succcurlyeq_S$ across all possible $S \subseteq D$ satisfy axioms 1, 2, 3 if and only if there exist continuous value functions $v_1 = L(X)^1 \rightarrow \mathbb{R}, v_2 = L(X)^2 \rightarrow \mathbb{R}, \ldots, v_k = L(X)^k \rightarrow \mathbb{R}$, $k \leq j$, such that, for any set of motivationally salient dimensions $S \subseteq D$, $\tilde{\succcurlyeq}_S$ is represented by the expectation of a utility function $\tilde{u}_S = \varphi_S \circ u_S$, where

$u_S := L(X) \rightarrow \mathbb{R}$ is the additive form:

$$u_S(p) = \sum_{j \epsilon S} v_j(p_{ij}) = \sum_{j \epsilon S} v_j(p_{1j},\ p_{2j}, \ldots, p_{nj}) =$$

$$= \sum_{j \epsilon S} (p_{1j}\ v_j(x_{1j}) + p_{2j}\ v_j(x_{2j})\ + \cdots + p_{2j}\ v_j(x_{nj}) = \ = \sum_{i=1}^{n} p_i \left(\sum_{j \in S} v_j(x_{ij}) \right)$$

for each $p \in L(X)$, where p_j is the lottery *p* in the dimension *j*, is agent's valuation of the p^j in the dimension *j* and, $p_i v_j(x_{ij})$ is the probability of outcome *i* times the agent's valuation of the outcome *i* in the dimension *j*.

$\varphi_S := u_S(L(X)) \rightarrow \mathbb{R}$ is a strictly increasing transformation, is the form:

$$\varphi_S(u_S(p)) = \varphi_S \left(\sum_{i=1}^{n} p_i \left(\sum_{j \in S} v_j(x_{ij}) \right) \right) = \sum_{i=1}^{n} p_i \left(\sum_{j \in S} \varphi_j v_j(x_{ij}) \right)$$

In this probabilistic or uncertain case the preference order $\succcurlyeq_S$ is represented by the expectation of a composite function $\tilde{u}_S = \varphi_S \circ u_S$. This function, in turn, is the result of the application of a strictly increasing transformation φ_S to an underlying additive utility function u_S. The transformation φ_S can be interpreted as reflecting the agent's attitudes toward risk for each $S \subseteq D$. In the context of expected utility theory, the risk aversion is equivalent to the concavity of φ_S, the risk seeking is associated to the convexity of φ_S and the risk neutral to the lineal function. We can see that it allows us every possible choice of strictly increasing transformations φ_S (for $S \subseteq D$) to represent the agent's risk attitudes. That is, we can have an agent who is risk seeker for some sets of motivationally salient dimensions and is risk averse for others.

Proof of Theorem 2 based upon Dietrich and List (2011): suppose at least three dimensions are effective. Firstly, assume axioms 1, 2, 3. There exist continuous functions $v^j: L(X)^j \to \mathbb{R}$, $j \epsilon D$, such that the restriction $\succcurlyeq_S$ for any $\succcurlyeq_S$, $S \subseteq D$, to the set *L(X)* of sure lotteries is represented by the function $u_S: L(X) \to \mathbb{R}$ given by $u_s(p) = \sum_{j \epsilon S} v_j(p)$. Let $S \subseteq D$. By assumption, there exists a function $\tilde{u}_S: L(X) \longrightarrow \mathbb{R}$ whose expectation represents $\succcurlyeq_S$. In particular, $\tilde{u}_S$ represents the restriction $\succcurlyeq_S$ of $\succcurlyeq_S$ to *L(X)*, the set of sure lotteries. So, $\tilde{u}_S$ represent the same order $\succcurlyeq_S$ as u_S. Hence, $\breve{u}_S = \varphi_S \circ u_S$ for some strictly increasing function φ_S: $u_S(L(X)) \to \mathbb{R}$, as desired.

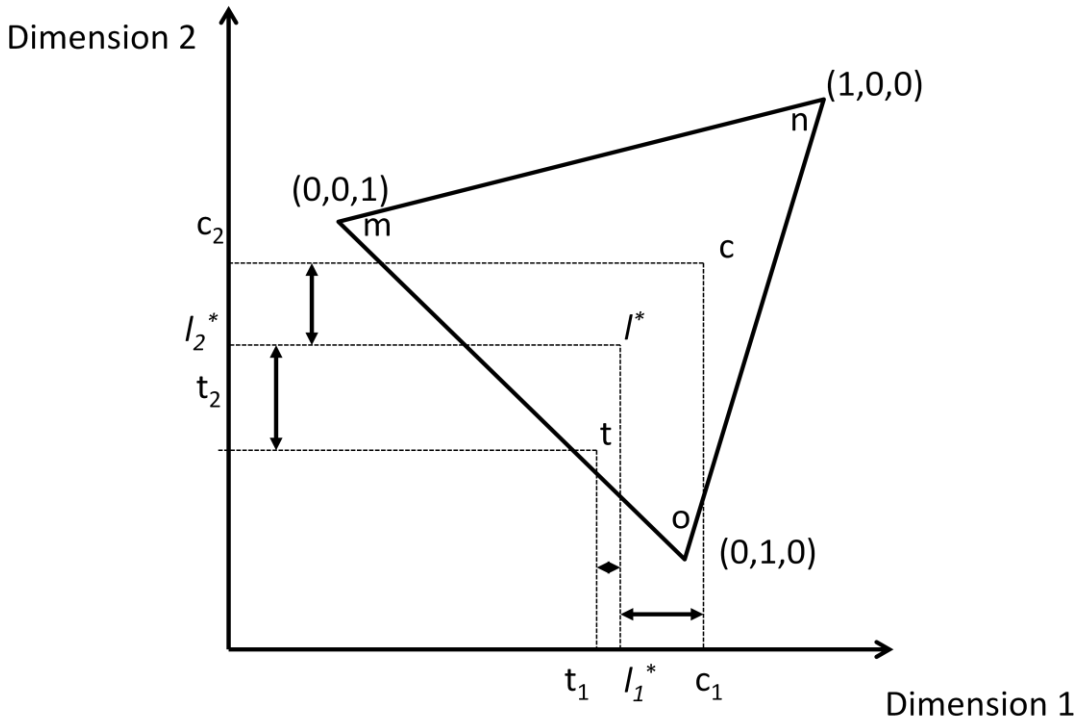
Conversely, assume that the orders $\succcurlyeq_S$, S $\subseteq$ D, are representable in the specified way, and let u_S, φ_S, u_S, S $\subseteq$ D, be the functions that feature in one such representation. In particular, the restriction $\succcurlyeq_S$ of any $\succcurlyeq_S$ to the *L(X)* of sure lotteries is representable by $\tilde{u}_S$, hence also by u_S (as u_S and $\tilde{u}_S$ are strictly increasing transformations of each other).

3.3.2 An application

The following example is related to preferences for activities, such as engaging in *combat (c)* or *taking care hostages (t)*. Associated with each activity there are three results: **win**, **tie**, **loss**, with *g*> *m*> *b* and three probabilities *p*, *q*, 1-*p*-*q*, respectively. Consider a simplex, $\Delta = \{p \in \Re_+^N: p_1 + \cdots + p_N = 1\}$, in two-dimensional space shown in Figure 14. Each vertex of the simplex stands for the degenerate lottery where one result is certain and the other two results have probability zero. Each point in the simplex represents a lottery over the three possible results. It was drawn for two dimensions. Dimension 1 might represent a

context wherein legitimate army engages the armed organization, while dimension 2 might represent the scenario where the government expresses a willingness to negotiate. For simplicity, we list five distributions of probabilities. Three of them are degenerated *m*, *n*, *o*; and non-degenerated three, *c* and *t*, with *c* = (*p,q,1-p-q)* and *t = (r, s, 1-r-s).*

Figure 14 - Dimensional Simplex



Source: Elaborated by the author (2013).

Case 1: S = {1}

In this case dimension 1 is motivationally salient for the agent. So, whether the agent prefers *c* over *t*, $c \succ t$, implies:

$$\varphi_S\big(u_S(c)\big) > \varphi_S\big(u_S(t)\big)$$

Where

$$\varphi_S\big(u_S(c)\big) \equiv \varphi_S\big(u_S(p, q, 1-p-q)\big)$$
$$= p\big[\varphi_1\big(v_1(g_1)\big)\big] + q\big[\varphi_1\big(v_1(m_1)\big)\big] + (1-p-q)\big[\varphi_1\big(v_1(b_1)\big)\big]$$

and

$$\varphi_S(u_S(c)) \equiv \varphi_S(u_S(r,s,1-r-s)) \\ = r[\varphi_1(v_1(g_1))] + s[\varphi_1(v_1(m_1))] + (1-r-s)[\varphi_1(v_1(b_1))]$$

What does this mean? In intuitive terms, by the characteristics of the scenario in which he is making a decision, he prefers *to combat* to an available another alternative. This is crucial to understand what are choices followed by the agents in determined scenarios depending on consequences. In this case, the combat action might be less risky than kidnapping action because in that scenario they are facing pressure from Army in order to free the hostages.

Case 2: S = {2}

In this case dimension 2 is motivationally salient for the agent. So, whether the agent prefers *t* over *c*, $t \succ c$, implies

$$\varphi_S(u_S(t)) > \varphi_S(u_S(c))$$

Where

$$\varphi_S(u_S(c)) \equiv \varphi_S(u_S(p,q,1-p-q)) \\ = p[\varphi_2(v_2(g_2))] + q[\varphi_2(v_2(m_2))] + (1-p-q)[\varphi_2(v_2(b_2))]$$

And

$$\varphi_S(u_S(t)) \equiv \varphi_S(u_S(r,s,1-r-s)) = \varphi_S(u_S(c)) \equiv \varphi_S(u_S(p,q,1-p-q)) \\ = r[\varphi_2(v_2(g_2))] + s[\varphi_2(v_2(m_2))] + (1-r-s)[\varphi_2(v_2(b_2))]$$

We are modeling the agent's behavior in the context of an illegal environment. It is important to establish that agents have a more preferred alternative and prefer other alternatives less depending on the dimension in which they are. In a scenario within an armed

illegal organization where agents follow orders from their leaders, the disparity between their preferences and the tasks assigned by the leaders, can lead to changes in the agent's behavior.

We define the function $v_j = \alpha_j |x_j|^{\delta}$, where $\alpha_j \geq 0$ is the weight assigned to each dimension *j*, *x* stands for the lottery, $x = \{c, t\}$, and $\delta \geq 1$ is the parameter specifying the degree of the metric. The following Table 6 displays the characteristics of two lotteries and two dimensions.

Table 6 - Two lotteries and two dimensions

Lotteries	Dimensions	Results	Probabilities
C *Combating*	Dimension 1: The army is combating c_1	V_1 (g)	p_1
		V_1 (m)	q_1
		V_1(b)	$(1\text{-}p\text{-}q)_1$
	Dimension 2 The army is not combating c_2	V_2 (g)	p_2
		V_2 (m)	q_2
		V_2(b)	$(1\text{-}p\text{-}q)_2$
T *Take care of hostages*	Dimension 1 The army is combating t_1	V_1 (g)	r_1
		V_1 (m)	s_1
		V_1(b)	$(1\text{-}r\text{-}s)_1$
	Dimension 2 The army is not combating t_2	V_2 (g)	r_2
		V_2 (m)	s_2
		V_2(b)	$(1\text{-}r\text{-}s)_2$

Source: Elaborated by the author (2013).

We define the function $\varphi_j(v_j) = -\gamma^{-v_j}$ with $\gamma > 1$ the agent is risk averse and $\varphi_j(v_j) = \gamma^{-v_j}$ with $\gamma < 1$ where the agent is risk seeking. It's possible to define a function of risk for each dimension.

$$\begin{aligned}\varphi_S(u_S(c)) &\equiv \varphi_S(u_S(p, q, 1-p-q)) \\ &= p[\varphi_2(v_2(g))] + q[\varphi_2(v_2(m))] + (1-p-q)[\varphi_2(v_2(b))] \\ &= p\left[-\gamma^{-(-\alpha_2(g)^{\delta})}\right] + q\left[-\gamma^{-(-\alpha_2(m)^{\delta})}\right] + (1-p-q)\left[-\gamma^{-(-\alpha_2(b)^{\delta})}\right]\end{aligned}$$

And

$$\varphi_S\big(u_S(c)\big) \equiv \varphi_S\big(u_S(r,s,1-r-s)\big)$$
$$= p\big[\varphi_2\big(v_2(g)\big)\big] + q\big[\varphi_2\big(v_2(m)\big)\big] + (1-p-q)\big[\varphi_2\big(v_2(b)\big)\big]$$
$$= r\left[-\gamma^{-(-\alpha_2(g)^{\delta})}\right] + s\left[-\gamma^{-(-\alpha_2(m)^{\delta})}\right] + (1-r-s)\left[-\gamma^{-(-\alpha_2(b)^{\delta})}\right]$$

The transformation φ_S can be interpreted as reflecting the agent's risk attitude for 1 and 2 dimensions. In particular such transformation will depend on the set of motivationally salient dimensions *S*. In the case that interests us here, we can have an agent who is risk loving for some set of motivationally salient dimensions i.e., he prefers to combat over taking hostages when the legitimate army is combating –this characterizes dimension 1–. In that dimension, we can say that the agent is risk loving. But if the army is not combating, he will maybe prefer taking care of hostages over combating. This denotes an agent who is risk averse. Despite we are talking about the same agent.

According of Dietrich and List (2011) the agent's preference order over some choice options changes as a result of new information whenever he assesses the lotteries by which he or she represents those options. This assessment is done through Bayesian updating: The relevant probability distributions after learning the new information are obtained from the ones before learning it via Bayes's rule, as in standard rational choice theory.

3.4 Conclusions

This essay discussed, firstly, three different interpretative approaches from economic theory: The first was taken from Phillips and Pohl (2013) who saw the preference problem as a change in the risk for the agents. The second approach came from Shapiro (2013) who presented the problem as a divergence of preferences both underlying and induced. The third outlook from Dietrich and List (2011) formally stated that such preference changes are due to the presence of motivationally salient dimensions, in which alternatives are modeled as points in some multidimensional space and, only some of whose dimensions play a role in shaping the agent's preferences. Secondly, the reasons behind the change in the behavior of an agent who was initially committed to the cause of the organization, and agreed with the leaders on how best to serve the cause.

However, in the case of the FARC, some low-ranking agents exhibited remarkable changes in their behavior, showing that their preferences and beliefs were not aligned with their leaders' preferences; this developed as a result of the organization's leaders who adopted

the policy of long term political kidnappings. The leadership did not fully evaluate the consequences that this strategy would have upon their agents.

This phenomenon engulfed the organizational structure at the same time that increasing government's strategies for stimulating desertion were being instituted.

With the third approach was possible to see the importance of conditions in which agents make decisions. This method would capture the agents' changes of their behaviors when they face situations with different levels of risk. In order to capture the essence of this method in a precise way, in the case of the FARC, we can therefore think of the agent as if he is making decisions faced two critical situations: *To combat* and *kidnapping*. It is assumed that agent has different attitudes toward the risk depending upon where he is. If he prefers to combat over kidnapping, he might be more willing to assume a higher level of risk that he will assume in the kidnapping situation. But, he dislikes the kidnapping over to combat, thus he might be more averse to risk when he is making decisions in that situation. That is, with this example we illustrate the role of risk attitudes, which is useful to identify the effects of external different situations on agent's behavior.

Therefore, the contribution of this essay is showing that different approaches from economic theory may explain why agents change their preferences taken like fixed preferences. Two factors affect the scenario where agents make decisions:

a) the principal's choices not discussed by him due to top-down decision-making structure of his organization that reduces any space for agent's participation and;
b) the external conditions that not directly depend on the behavior of organizations as whole.

Despite agents identify with the organization's objectives, however some not expected decisions may not be well received. It is to do with the expectative of each member of the organization have action's consequences. As Shapiro (2013) says principal and agents evaluate in different way the consequences of actions taken by the organization. Particularly, when principal's decisions has a long-term impact. In our case, the combat action can be perceived by the agent as an action which the results are immediate and where is involved the way in how agents act. While kidnapping results depend on outside conditions beyond agents' control like a successful negotiation between organization's leadership and government. Both parties are facing different levels of risk. By the same physical and organizational separation between principal and agents, the latter that are in most direct contact with hostages will tend to construct relationships with them. The principal won't have control over the effects of such

interaction on agents' behavior. He doesn't also know how the environmental changes affect the preferences of agents.

4 ESSAY III: A MODEL OF DESERTION: A PRINCIPAL-AGENT THEORY PERSPECTIVE APPLIED TO ARMED ILLEGAL ORGANIZATION (AIO)[28]

The objective of this essay is to analyze, through a principal-agent model, the nature of the *trade-off* between incentives and enforcing mechanisms that an Armed Illegal Organization – AIO's leadership, acting as the principal, offers to its members, acting as agents –. Such tangibles and intangibles incentives that all viable organization provides to individuals are in exchange for contributions of individual activity to the organization.

The principal-agent approach based on the principles of rational choice and game theory is used to understand the dynamics between a principal, who delegates tasks to another in order to reduce information costs. And an agent, who on behalf of the principal carries on those delegated actions. Such a framework is appropriate for analyzing combatant-leadership relationship in an illegality context when the enforcement of contract between them can't be exogenous or in a context where the information is asymmetric. So, the only effective contract between them is a self-enforcing contract or *agreement*, as we will call if from on now. Paraphrasing Shapiro (2013), it is worth to indicate that given the lack of standard, contingent contracts, illegal organization leaders really have is, first, to punish agents whose average performance falls below a threshold. Second, leaders have is to end their relationship with problematic agents and deny them the ideological and pecuniary benefits of participation.

When an individual decides to belong to illegal organization, he is accepting to enter into a compliance and subordination relationship with the organization's leadership. Even though such relationship acceptance or "contract" by the agent is allegedly based on the identification of his principles with the organization's principles, both have an overall expected value and costs of it. In other words, the main question of this essay is what is the compensation system that will produce a behavior by the agent consistent with the principal's objectives? The focus is on the nature of the incentive system that guides the distribution of those incentives, as well as the conditions of risk and information that influence the choices of the actors (MITNICK, 2013).

It is important to bear in mind that the concept of contract as it has been treated in conventional principal-agent theory, is not directly applicable to this scenario. The idea of

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contract assumes both principal and agent have clear mechanisms to ensure it compliance. However, in a context of illegality, the contract works as an *agreement* in which institutions outside of AIO not exist to guarantee parties' liability. The principal creates his own enforcement mechanisms to force the agent to comply with his functions. The agent has only his ability to make credible threats if he considers that his interests are not in concordance with principal's interests, because he knows the leader has a strong personal interest in maintaining his organization. Generally, the minimal expectation of agents is that the leader will not allow his group to decline of collapse (CLARK; WILSON, 1961).

First, this model focuses on both the expected benefits and costs for those who decide to stay in or defect from the armed organization, in a context of an active involvement of the third party. The hypothesis' essay is the government's presence, for example as an external party, can lead and deepen the opportunistic behavior of the agents. The agent will stay into the armed organization when the leader is willing to share his risk to such a level that it improves the agent' future benefits to a point where they outweigh the costs incurred by not deserting.

Second, this model also focuses on his cooperative behavior related to his effort level in performing the tasks assigned to him, once the agent has decided not to defect the AIO. The leader cannot know what his agents are doing on the ground without being there himself, or increasing resources dedicated to monitoring the agent. In this sense, the contribution of this model is to incorporate the risk of being punished as a function of the incentives offered by the principal when the government is actively encouraging desertion. Given that the AIO's resources are scarce, the leader has to decide how to divide their initial endowments between incentives and coercive expenses. Economic incentives offered to those deciding to stay in the organization, are detrimental to its capacity of ensuring punishing deserters. These resources decrease the leader's utility while it increases his operation costs. The problem posed to the principal is that large incentives chosen to stop the demobilization of his agent, can compromise his credibility to penalize those who have decided to leave the AIO.

The main contribution is to try to find the leader's optimal response to the *trade-off* between the incentives and a rate of punishment. We argue that if the government is improving its policy of compensating those who desert, then the AIO must increase its incentives and, consequently, the probability of punishment will probably decrease if AIO's resources are scarce. We compute the optimal solutions for a fixed set of parameters of the principal-agent model. We found that the inclusion of a self-enforcing mechanism in the

leader's objective function could stop the agent's desertion but it would encourage agent to choose a low effort, revealing their opportunist behavior (referred to as a moral hazard problem).

In a non-conventional warfare, one of the major difficulties faced by the state is to destroy its enemy's social and organizational networks in order to frustrate the achievement of its main goals. When the use of military force alone cannot deliver, it is necessary to design other types of mechanisms that affect the decision making process of the rebels by increasing their current and future costs, and decreasing their current and future benefits. Such mechanisms can be economic or moral incentives that can be used in combination with a strong military pressure, that make the desertion more attractive than continuing combat activities. Therefore, the problem that the state seeks to resolve is finding incentives that help to reveal preferences for desertion of the illegal armed group's agents. In the case of an economic reward, its amount should be so high that helps to discover at least one agent for whom the benefits of action outweigh the costs she has incurred in (CASTILLO; SALAZAR, 2009).

However, the mere economic incentives without continued military pressure are useless. Only when the military pressure reaches a certain threshold and is continuous will fighters consider economic incentives from outside. On the other hand, faced with strong pressure of the state's armed forces, the Armed Illegal Organization's (AIO) leadership must also create mechanisms to counteract them. This would involve setting up a system of transfers and a punishment, which might well be a *trade-off* between incentives, which encourage and keep the compliance and allegiance of their combatants to the organization and, their ability to punish the opportunist behavior of the agents as a self-enforcing mechanism (GAROUPA, 2001).

We elucidate the mechanism with a detailed case study of the FARC[29], as an example of an AIO, who operates in Colombia and suffered substantial changes in the leadership-combatant relationship during and after of the adoption period of political kidnapping as a war strategy. Our model gives a new complementary explanation why high desertion rate of FARC's ranks in a period when the government launched a program to encourage the desertion. In Castillo and Balbinotto (2012) offer an analysis of costs in order to explain the same problem.

[29] Fuerzas Armadas Revolucionarias de Colombia –the FARC by its acronym in Spanish– are a revolutionary guerilla organization involved in a continuous armed conflict since 1964 in Colombia, located in northwestern South America.

The literature is rich in applications about principal-agent theory to legal organizations as the church (ZECH, 2007; 2001), the civil-military relationship (BAKER, 2007, FEAVER, 2003), violence against civilians as a result of a lack of principal control (ABRAHMS; POTTER, 2014, SALEHYAN; SIROKY; WOOD, 2012; SCHNEIDER, 2009, SCHNEIDER; BANHOLZER; HAER, 2010), the relationship between coalition forces (principal) and local tribes (agents) in Afghanistan (PÉREZ, 2011) or the army and illegal organizations as terrorists (BYMAN; KREPS, 2010, SHAPIRO, 2013, 2012, 2007, 2008).

Additionally Siquiera and Sandler (2010) show a game-theoretic representation of a global terrorist organization who determines the optimal nature and level terrorist attacks in each country through its choice of representative associated with the local terrorist group, taking in account the counterterrorism efforts of government where they operate.

The approach used here allows us to show the dilemma faced by an AIO when she has to decide between incentives and punishments to avoid the defection of her agents as a constant threat, encouraged by a third party. More specifically, how she manages the tradeoff between incentives and self-enforcing mechanisms.

The rest of the essay is structured as follows. Section 2 provides figures about FARC's desertion as a motivation for this essay. Section 3 provides a literature review on the Agency Theory with applications on political economic field. Section 4 presents the principal-agent model. In Section 5 focuses on the numerical computation of the principal-agent model and on the analysis of the results. Section 6 discusses a possible two principal-one agent model. Finally, Section 7 concludes by summarizing the key results of that analysis.

4.1 The figures underlying the FARC's desertion

We cite the FARC as the hard case for testing the idea that AIO suffer from agency problems and significant desertions of their agents some one of the most visible consequences.

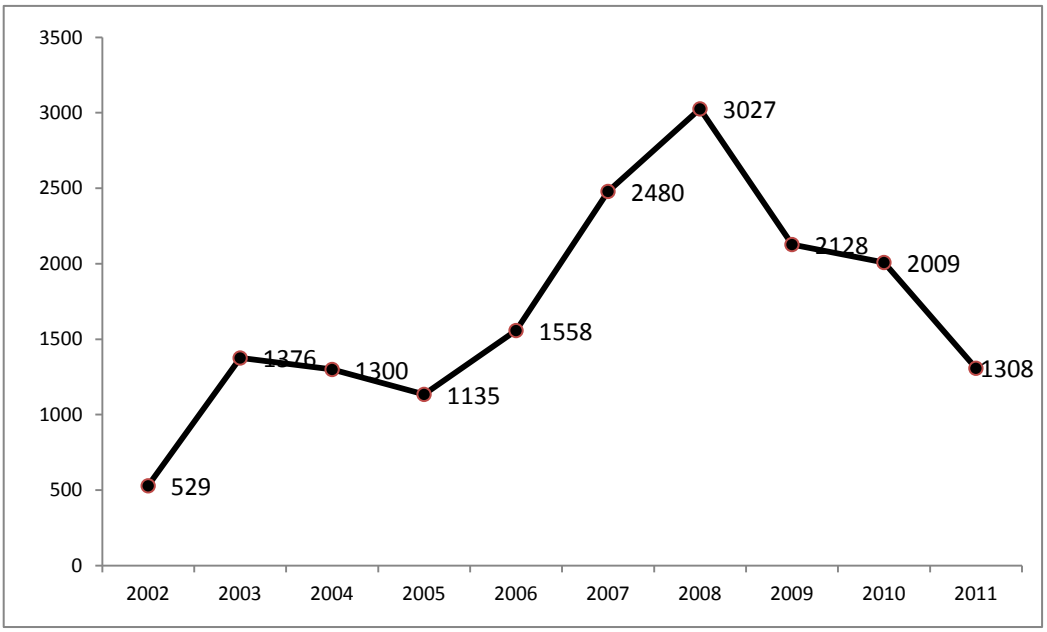
From the beginnings of Álvaro Uribe Velez's government in 2002, desertion became a real concern for the FARC, the oldest guerrilla insurgency in Latin America[30]. President

[30] Some experts mark the beginning of the FARC in 1964 after a particularly gruesome period of widespread political violence in Colombian history, known as *La Violencia* (1948-1958), which claimed over 200,000 lives. This period ended with an agreement between the Liberal and Conservative parties to share power for the next sixteen years. Meanwhile, landless rebels organized themselves together under the FARC, which was formally, but not openly, established as a military wing of the Colombian Communist Party. During this time, FARC's membership numbers ranged from 50 to 500 men, spread throughout the rural areas of central and southern Colombia. The FARC was only capable of small hit and run tactics amounting to a couple of

Uribe's strategy focused on combating the FARC and encouraging rebels to desert, as they brought with them valuable information and undermined the moral of those combatants still in the guerrilla organization. This government created a program which provides incentives related to health coverage, stipends and reduced jail terms. Through this program and the Colombian army's military pressure, the FARC has suffered the desertion of thousand of its fighters. But one of the most serious desertions and one of the most important setbacks was the surrendering of Nelly Avila Moreno better known as Karina, to the Colombian Army. Karina led a series of devastating guerrilla attacks in the 1990's. She spent 20 years of her life in the Colombian jungle and was the leader of the FARC's 47 Front, one of the most important fronts of that organization. Karina's desertion helped Colombian military intelligence mount additional offensives against the guerrillas. Karina turned herself in, and she now promotes the Colombian government's demobilization program (Colombia's rebel turncoats). This voluntary demobilization of agents of armed groups in Colombia, especially from the guerrillas, was one of the cornerstones of the democratic security policy of President Uribe. Between August 2002 and 2011, the FARC desertions hit a record 16,850 (See Figure 15). Although it is estimated that close to 80% of deserters were lower-ranking agents of the organization, with fewer years of membership, mostly young and with poor skills to the war, it is clear that the program has been a success.

attacks per month (MADDALONI, 2009). Almost fifty years later, the FARC is considered America's oldest and largest insurgency of Marxist origin (KURTH, 2004).

Figure 15 - The FARC's Individual Demobilizations



Source: COLOMBIA. Ministry of National Defense (2002-2011).

However, Uribe's policy is responsible for only a part of desertion. It also helps that the FARC has a hierarchical organization, operating fronts over vast distances, in jungle areas with a poor transportation and communication infrastructure, so making difficult monitoring their agents and deepening the moral hazard problems. As Shapiro and Siegel (2007) say, in the context of a covert system, the agent holds an inherent threat over the organization. If agents are too dissatisfied with their punishment, they may be more likely to accept the government's offerings.

4.2 Literature Review

In the business literature, Agency Theory studies an asymmetric relationship between two individuals (principal and agent), in which the former delegates tasks on the latter, for him to act on his behalf, in a context in which the principal cannot directly observe the agent's behavior and cannot verify if the tasks entrusted are being carried out (EISENHARDT, 1989).

To motivate the agent, the principal must offer a sufficiently attractive incentive scheme in order to obtain his best effort (ARROW, 1985, GIBBONS, 2002, GORBANOFF, 2003, MACHO; PÉREZ, 1994, MAS-COLLEL; WHISTON; GREEN, 1995, RICKETTS, 1986, 2002, REES, 1985, ROSS, 1973, SHAPIRO, 2013, SOWER, 2005, STIGLITZ, 1987).

This arrangement takes on the shape of a contract that governs and rules the principal-agent theory relationship. Therefore, the problem is one of selecting a compensation system that will produce behavior by the agent consistent with the principal's preferences (MITNICK, 2013). Under the assumption that the information circulated is valuable, each agent purses his own interest, acts rationally, and has different perceptions regarding risk. The Agency Theory proposes solutions to the problems which are faced by the principal. For him however the information generated is poor because the agents' actions are unknown to the principal and thus affect the results that he expects to obtain.

The use of analytical elements of Agency Theory has gone beyond the relationship between manager and worker in industrial organizations (SPENCE; ZECKHAUSER, 1971), and is being used in the fields of political economy (GAILMARD, 2012, GROENENDIJK, 1997), international relations (ELSIG, 2010, POLLACK, 2006), church-pastor relationships (ZECH, 2007, 2001), civil-military relationships (FEAVER, 2003), relations between states and terrorist agents (BYMAN; KREPS, 2010) and foreign policy (KASSIM; MENON, 2003, NIELSON; TIERNEY, 2006).

Specifically, Agency Theory seeks to study the non-aligned relationships between leaders (principals) and the troops (agents) of armed groups and, deals with them as if they were an ordinary organization. These applications suggest the flexibility of the principal-agent theory, and the power of its applications into other fields. For instance, Thompson (2002) shows that the evolution the relationship between a non-violent state (Iran) and a terrorist organization like HAMAS depends on the costs and benefits for each of the actors. Such a relationship will continue to exist while de actor's cost-benefit calculi for contracting remain preferable to the next best alternative. In the same of research line, Shapiro (2013) uses a wide variety of evidence to show how terrorist groups manage their operatives and, the set of standard tools from management as any other legal organization. Using the agency theory perspective, this author analysis why terrorist groups are organized, the way they are and how to effectively deal with them.

Schneider (2009) uses the explanatory power of the principal-agent theory with multiple tasks, to analyze the behavior of some leaders or commanders of armed groups who, in order to obtain their objectives more efficiently, encourage their troops to use violent mechanisms against the civilian population. This author argues that most of the models applied in this field, are focused on violence as a tool and, therefore, ignore the dilemma the agents face when deciding between military and terror strategies. If the military commander

is only interested in a global effort from the soldiers to reach the goals of his organization, while soldiers prefer low cost activities, that is a combination of terror strategies (against the civilian population) and military strategies, the level of activity – will most probably – depends upon the rewards or punishments the soldiers receive. This means, generally, that soldiers are not interested *per se* in exercising violence against civilians. They will only do it if there is an incentive system that induces them directly to take this type of action.

Schneider (2009) shows that, for example, the rewards offered, in species, such as drugs, or punishments such as lack of food, make soldiers be more likely or more inclined to use violence against the civil population. The military hierarchy also increases this probability, contradicting some of Humphreys and Weinstein's (2006) in the sense that organizational anarchy is a cause of violence against civilians. In an armed organization, the typical hierarchical structure acts as a barrier against civilian abuse, when practiced by the commanders. However, if they are in charge of delegating these tasks, then, the soldiers are encouraged to commit crimes against the civilian population.

On the other hand is Haer's work (2010). He argues that the victimization of civilians is the result of the lack of control by the principal. According to his approach, the principal would have the capacity to control his agents if the proper selection methods were used and if the control and surveillance mechanisms were stricter. Based on the results of interviews with 96 agents of armed movements in the Democratic Republic of Congo, the author shows the relationship between control mechanisms and the level of violence towards civilians. Although the approach of Agency Theory we present here goes in the same direction, we deviate a somewhat in the way it will be used.

A much closer approach to the problem presented here is Polo (1995) and Gates (2002). Their models are based on the role geography plays as a key variable for understanding the supervision, monitoring and control that of a criminal organization exerts on its agents. Polo's research is based upon the internal organizational features of the mafia.

Gates (2002) goes a step further, and features an analysis of enforcing mechanisms available to a rebel group. Unlike other criminal groups, a viable rebel group needs an army capable of engaging the government militarily and it needs to create mechanisms to recruit and motivate its soldiers to fight and kill. Gates' contribution is to show how geography, ethnicity, and ideology distance are engines that drive military success, deterring defection within armed rebel groups and shaping recruitment.

Unlike all the other studies of agency theory applied to illegal organization, this essay incorporates the risk of being punished as a function of the incentives offered by the principal when a third party as the government is actively encouraging desertion from the AIO. Given that the AIO's resources are scarce, the leader has to decide how to divide their initial endowments between incentives and coercive expenses. The presence of government affects, firstly, the principal's decisions about the balance between compensations and punishments. Secondly, the agent could take advantage of this situation and benefit of his opportunistic behavior. Since the agent is assessing the offerings by the two parties.

4.3 Modeling principal-agent relations

In the following section we discuss the Principal-Agent model applied to an Armed Illegal Organization (AIO), taking the FARC as a case study. Our model is derived from Gintis (2009).

4.3.1 A basic principal-agent model

We start with an illegal armed organization (AIO) considered as one that cannot rely on the external enforcing of the judicial institutions and whose behavior and possibilities are not constrained by the law (POLO, 1995).

It is made up of a leader or principal (*L*) and agents or combatants, which are represented by the only agent (*A*). We departed from an assumption, the leader and the agent are involved in a relationship from moment the agent becomes part of the organization. Therefore, the interaction between them is of individuals who are already in the AIO and who are facing a conflict of interests.

For now, we assume that all *A* are identical. This assumption is unrealistic and will be relaxed in future, but for now it allows us to look to the key points of the interaction between leader and agent.

The leader cares mainly about the reputation of the AIO. His benefits or costs are not necessarily material, they are most likely to be political as reputation denoted as high reputation *R*, and low reputation *r*.

Assume that *A* has two *c*hoices within the organization: Desert (*D*) or not to Desert (*ND*). If *A* decides *ND*, then he must make a decision between two possible levels of effort

that express his compliance effort level with the organization –high *h* or low *l*–. L just observes if *A* deserted or not, but *L* is unable to realize the compliance effort level that he chooses. So, that *L* has only the outcomes by which he assess *A*'s actual behavior and rewards him.

We present a model of desertion and allegiance for an AIO without a direct interference from the government. The essay concludes with a discussion of the broader implications of this study for the making of decisions of *L*.

As in the canonical principal-agent model, the model sketched above assumes that there is one-sided uncertainty. First, there is an uncertainty situation faced by *L* once *A* has made the decision not to desert. Namely, *L* knows the real state of *A* because he knew *A* decided not to desert. However, *L* is unable to know if *A* has a high or low compliance within the organization.

In the case of desertion, *L* is also unclear about the exact damage A's desertion will cause to the AIO. *L* can estimate how much information A owns, because *L* knows what his position was within the organization's rank structure, and his or her time spent in the AIO. However, once *A* had left the organization, *L* has lost the control over A and his future decisions. How much intelligence information *A* is willing to provide will depend on government's rewards. This is why the leader is very willing to devote resources to detect deserters. On the other hand, *A* is completely informed about *L*. These elements feature the non-cooperative game.

4.3.2 Timing of the generalized communication game

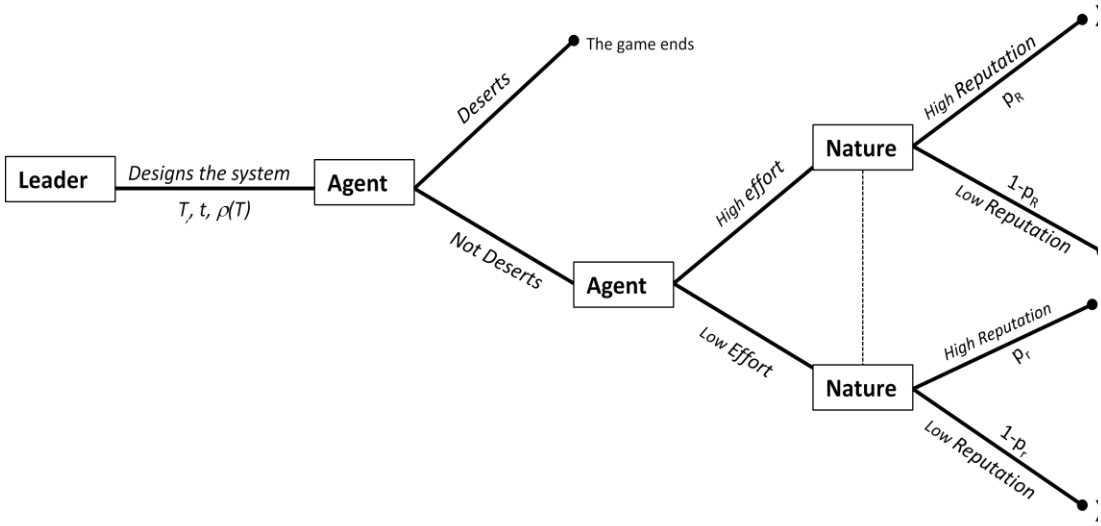
The following example captures much of the intuition about the main factors affecting the relationship between a leader and an agent in a covert nature context where the desertion is a viable alternative, where the government, additionally, is offering incentives to give information about her organization.

Consider the following "desertion" game, a simplified sketch of our situation above. Figure 16 sets up the environment and describes the choices leading up to the one-shot *agreement* among players.

There are three players: the leader *L*, an agent or agent *A* and, the Nature *N*. There are two possible levels of benefits for the leader on behalf of the armed organization, high

reputation (*R*) and low reputation (*r*). The first player is the leader player who decides the proper transfer system (*T, t, ρ(T)*) for *A.*

Figure 16 - Timing of Principal-Agent Game



Source: Elaborated by the Author. X_1, X_2 ,X_3, X_4 are possible results of the game for both players (2013).

The agent *A* receives a transfer from *L* when he decides not to desert. In this case, if the reputation level achieved is high (*R*) he pays *T* and *t* if the reputation is low *(r*), with $T - t > 0$.

The agent can affect the probability of high reputation by choosing to perform his task with either high effort (*h*) or low effort (*l*). With high effort the probability of reaching *R* is p_R, and with low effort the probability of *r* is p_r, where $0 < p_r < p_R < 1$. This implies that any leader who has a benefit function and is increasing in reputation prefers the stochastic distribution of reputation[31] induced by the high effort level *h* to that induced by the low effort level *l*.

If the leader could see the agent's decision, he could simply insure a transfer to induce a high effort, but he cannot. The only way he can induce *A* to perform his task well is to offer a proper incentive system: offering a transfer *T* if his reputation is high and *t*, if it is low.

Suppose that agent's utility function is given by *u(T),* and *u(t),* respectively, thus $u_t, u_T > 0$, and u_{tt}, $u_{TT} < 0$, so the agent has diminishing marginal utility of the transfer.

[31] It means that bad results are more likely when the agent is lazy than when he works hard. That is, it is easier that the result is greater than x_k (for any k<n) when effort is high than when it is low (MACHO; PERÉZ, 1994).

We assume that the cost of effort is greater when the agent performs his task well than for a sluggard agent: *c(k,l)* < *c(k,h)* where *k* represents the cost of being in the organization. If *A* decides for a high effort, he expects a high payoff:

$$p_R\big(u(T) - c(k,h)\big) + (1 - p_R)\big(u(t) - c(k,h)\big) \tag{1}$$

With low effort, the corresponding expression is

$$p_r\big(u(T) - c(k,l)\big) + (1 - p_r)\big(u(t) - c(k,l)\big) \tag{2}$$

Therefore, the agent will choose high effort over low effort only if the first of these expressions is at least as great as the second, which gives:

$$(p_R - p_r)\big(u(T) - u(t)\big) \geq c(k,h) - c(k,l) \tag{3}$$

This expression is the incentive restriction, or the incentive compatibility constraint (ICC). This one reflects the moral hazard problem: once *A* decides not to desert and since the effort level is not verifiable, *A* will choose the high effort level if (3) is accomplished. This constraint is increasing in *T*, if the agent is weakly decreasing risk averse. To verify this, we assume *T* as a function of *t* and differentiate the incentive compatibility constraint, getting

$$u_T \frac{dT}{dt} = u_t$$

So, $\frac{dT}{dt} > 1 > 0$, and the incentive compatibility constraint is increasing in *T* and *t*. To differentiate, we can say

$$u_{TT} \frac{dT}{dt} + \frac{d^2T}{dt^2} u_T = u_{tt}$$

$$\frac{d^2T}{dt^2} = \frac{1}{u_T}[u_{tt} - u_{TT}\frac{dT}{dt}] < u_{tt} - u_{TT} < 0,$$

and the constraint is concave.

In the second stage of the game, given the effort that *A* will exert is *h*, he decides whether or not to desert. Formally

$$p_R u(T) + (1 - p_R)u(t) - c(k,h) \geq (1 - \rho(T))u(g) \quad (4)$$

This equation is known as the participation constraint (PC), or the individual rationality condition. It reflects the fact that *A* can always desert if what he gets by choosing this action is not equal at least to what he can obtain from an outside alternative as the offered one by the government. Such participation constraint may be considered as agent's ability of threat. In the conventional principal-agent approach, the decision of not participating in the *agreement* by the agent has not cost for either side. But with this one, the agent might likely be severely injured if the he decides to desert.

The right side of equation (4) breaks down as follows. In $\big(1 - \rho(T)\big)u(g)$, after detection of desertion, a punishment system –a likelihood of being caught ρ −, if successfully applied, $\rho = 1$, leaves *A* without g that is the government's rewards for his information. Such probability acts as a mechanism to enforce an illegal contract (Garoupa, 2000). We further assume that $\rho_T < 0$, i.e. $\rho(T)$ decreases as T increases, $\rho_{TT} > 0$, it's a convex function; $u_g > 0$. This means that $u(g)$ increases as g increases and $u_{gg} < 0$, it implies that the function is concave. We suppose that $t \leq g \leq T$.

We show that the participation constraint is decreasing and convex. Differentiate the participation constraint (4), getting

$$p_R u_T \frac{dT}{dt} + (1 - p_R)u_t + u(g)\rho_t \frac{dT}{dt} = 0$$

Thus,

$$\frac{dT}{dt} = -\frac{(1 - p_R)u_t}{p_R u_t + u(g)\rho_t} < 0 \quad (5)$$

With the assumption that $p_R u_t > u(g)\rho_t$.

The second inequality holds because $T < t$, so if the agent is strictly risk averse,

$$\frac{d^2T}{dt^2} = -\frac{(1-p_R)}{p_R}\left[\frac{u_{tt}}{p_R u_T + u(g)\rho_T} - \frac{(p_R u_{TT} + u(g)\rho_{TT})u_t}{(p_R u_T + u(g)\rho_T)^2}\frac{dT}{dt}\right] > 0 \qquad 6)$$

Thus, the participation constraint is convex. It is increasing in *T* and decreasing in *t*. That is, if T is increasing, the agent remains at the organization. In contrary case, he deserts from it.

Clearly, under full information the solution to that problem is Pareto efficiency. But in the asymmetric information context, that is not true. So, the relevant question is whether there are other allocations which are Pareto superior to the market allocation and feasible for the leader, given the level of effort is not observable (GRAVELLE; REES, 2004, SHAVELL, 1979).

In the first stage of the game, the leader designs the incentive system, anticipating the agent's behavior. The expected benefit of the leader, if we assume that the agent performs his task well, is given by

$$p_R(\pi(R) - T) + (1 - p_R)(\pi(r) - t) - \rho(T)s \qquad (7)$$

Where *s* is the punishment amount and π(.) is the leader's utility derived from reputation, with $\pi_R > 0, \pi_r > 0, \pi_{RR} < 0, \pi_{rr} < 0$.

Formally, the incentive system that the leader proposes is the solution to the following maximization problem:

$$\underset{T,t}{\text{Max}} \quad p_R(\pi(R) - T) + (1 - p_R)(\pi(r) - t) - \rho(T, j)s$$

$$(p_R - p_r)\big(u(T) - u(t)\big) \geq c(k, h) - c(k, l) \qquad (3)$$

$$p_R u(T) + (1 - p_R)u(t) - c(k,h) \geq (1 - \rho(T,j))u(g) \tag{4}$$

In addition the negativity constraint $T \geq 0, t \geq 0$.

Where the first restriction is the PC (4) and the second is the ICC (3). We form the Lagrangean

$$\mathcal{L}(T,t,\lambda,\mu) = P_R[\pi(R) - T] + (1 - P_R)(\pi(r) - t) - \rho(T)s +$$

$$+\lambda[P_R u(T) + (1 - P_R)u(t) - c(k,h) - u(g) + \rho(T)u(g)] +$$

$$+\mu[(P_R - P_r)(u(T) - u(t)) - c(k,h) + c(k,l)]$$

The Kuhn-Tucker conditions can be written as:

$$\mathcal{L}_T = 0;\ \mathcal{L}_t = 0;\ \mathcal{L}_P = 0;\ \mathcal{L}_\lambda = 0;\ \mathcal{L}_\mu = 0;\ \lambda \geq 0; \mu \geq 0$$

Then we have

$$\mathcal{L}_T = -p_R - \rho_T s + \lambda[p_R u_T \quad + \rho_T u(g)] + \mu(p_R - p_r)u_T = 0 \tag{8}$$

$$\mathcal{L}_t = -(1 - p_R) + \lambda[(1 - p_R)u_t] - \mu(p_R - p_r)u_t = 0 \tag{9}$$

Assume that λ=0. Thus, by adding (6) and (9), we get

$$\mu(u_T - u_t)(p_R - p_r) = 1$$

Which implies $u_T > u_t$, so T < t. This, of course, is not incentive compatible, because ICC implies $u(T) > u(t)$, so T > t. In (8), it is also contradictory and therefore $\lambda > 0$, from which it follows the PC holds as an equality.

Now if we assume that $\mu = 0$, then by (8) and (9) solving this system of equations yields that $u_T = \frac{1}{\lambda}$ and $u_t = \frac{1}{\lambda}$. This implies that $u_T = u_t$, and $T = t$. This is impossible for ICC. Thus, $\mu > 0$.

Let T^*, t^*, $\rho(T^*)$ be the optimal incentive system such that the incentive compatibility constraint binds. It is given by

$$u(t^*) = c(k,h) - \rho(T^*)s - \frac{p_R}{p_R - p_r}[c(k,h) - c(k,l)] + u(g) \tag{10}$$

$$u(T^*) = c(k,h) - \rho(T^*)s + \frac{1 - p_R}{p_R - p_r}[c(k,h) - c(k,l)] + u(g) \tag{11}$$

Note that the agent achieves this position outside of organization, which is given by $\big(1 - \rho(T)\big)u(g)$. It is clear that as *g* rises, so do the two transfer rates *T* and *t*.

To sum up:
T is the high transfer
t is the low transfer
$\rho(T)$ is the probability of being caught or punished
c(k,h) is the cost of high effort
c(k,l) is the cost of low effort
g are government's rewards.

Corollary 1: *T and t are increasing in c(k,h)* and *g*: the *c(k,h)* is the sum of the fixed cost of not deserting (*k*) on the one hand, and the variable cost of executing a high effort on the other hand (*h*). With increasing Government's rewards, the cost of being in the organization increases, so *L* must devote more resources in order to encourage allegiance to the organization. As a result of government's activities, *L* is pushed towards high levels of transfers to agents (*T* and *t*) because of the participation constraint is therefore modified, and tends to be more severe. Such observation is a trivial consequence of increasing Government rewards, which are included into the model as a representation of outside activities. But it is important because of we are interested in studying the behavior of agents that belong to the organization and at a given time they might leave AOI.

Corollary 2: *the levels of T and t are bounded by the enforcing mechanism - probability of punishment:* as was defined above, ρ is the probability of being caught by the

leader and it is the self-enforcing mechanism which is a way of putting pressure on the agent to not desert and to accomplish the *agreement*.

As $\rho(T)$ rises, *T* and *t* fall due to the fact that AIO's resources are limited. The intuition is that the leader is more interested in his agent not deserting that he chooses a high effort, and so he must devote more resources to stop desertions. However, if he increases transfers to the agent in response to the rising of Government rewards, then the probability of punishing agents decreases. The leader's dilemma is clear: There will be a *trade-off* effect between transfers and the probability of punishment or self-enforcing mechanism. A system where the leader wants to penalize the agent can induce him to desert because *T* is decreasing.

Corollary 3: *the principal is risk averse*: as the leader's objective function is expanded to include the probability of punishment, then the optimal transfer system balances incentives and risk sharing. In this case, the introduction of a risk-averse leader does not change the implications of this model as long as the leader's risk aversion is significantly less than the agent's risk aversion. It is a realistic assumption supported by the idea that leader is more interested in achieving the alignment of objectives, than placing the agent in a risk-averse condition. But any effort from the leader to reduce or share the agent's risk will therefore reduce the potential costs to the agent. And, it will also increase the cost to the leader.

Corollary 4: *the optimal solution is to design an incentive system that almost gives the agent his entire expected reputation:* with a direct participation of Government rewards into the problem faced by the leader, an optimal solution for him is to design an incentive system that delivers the agent transfer amounts close to the his reputation value; independent of whether he is choosing a high or a low effort.

4.3.3 The benefits for the Leader

What action does the leader ask the agent to choose? For simplicity, we will denote the leader's benefits in each state of nature by $\pi(R) = R$ and $\pi(r) = r$, respectively. If *R* and *r* are the expected benefits in the good and bad states, respectively, then the return for inducing the agent to take action not deserting and take an action between *h* or *l* is

$\pi(h) = Rp_R + r(1 - p_R) - E_h$, $\pi(l) = Rp_r + r(1 - p_r) - E_l$, where E_h and E_l

are the expected transfers if the agent takes action *h* and *l*, respectively; that is

$$E_h = p_R T + (1 - p_R)t - \rho(T)s \text{ and } E_l = p_r T + (1 - p_r)t - \rho(T)s \tag{12}$$

Is it worth inducing the agent to choose high effort? For low effort, only the participation constraint $u(t_{min}) = c(l,k) + \big(1 - \rho(T)\big)u(g)$ must hold, where t_{min} the transfer is paid independent of whether benefits are *R* or *r*, with expected benefit $p_l R + (1 - p_l)r - t_{min}$. Choose the incentive system if and only if

$$p_R(R - T) + (1 - p_R)(r - t) - \rho(T)s \geq p_r T + (1 - p_r)t - t_{min}.$$

This can be written

$$(p_R - p_r)(R - r) \geq p_R T + (1 - p_r)r - t_{min} + \rho(T)u(g) \tag{13}$$

We will see that, in general, if the agent is risk neutral and it is worth exerting high effort, then the optimum is to make the leader the fixed claimant and the agent the residual claimant. To see this for the current example, we can let *u(T) = T* and *u(t) = t*.

The participation constraint is then:

$$p_R T + (1 - p_R)t = c(h,k) + (1 - \rho(T))u(g) \tag{14}$$

And the leader's profit is then $B = p_R R + (1 - p_R)r - c(h,k) - u(g)$.

Suppose that give *B* to the leader as a fixed payment and let *T = R – B*, *t = r – B*. Then the participation constraint holds, because

$$(p_R - p_r)(R - r) \geq c(h,k) - c(l,k) + \rho(T)u(g)$$

$$(R - r) \geq \frac{c(h,k) - c(l,k) + \rho(T)u(g)}{(p_R - p_r)} \tag{15}$$

But then,

$$T - t = (R - r) \geq \frac{c(h,k) - c(l,k) + \rho(T)u(g)}{(p_R - p_r)}, \tag{16}$$

which satisfies the incentive compatibility constraint. That is, the agent prefers to act in concordance with the solution found because transfers that he will receive are equals or higher that his cost differential plus a punishment probability times the utility from government. In intuitive terms, the payoff from the principal to agent, will lead him to do his best effort and not to have an opportunist behavior.

4.4 Simulation of the Principal-Agent Model

In this section we do an exercise of computing an optimal transfer system for a specific parameterization of the model based on the Government's presence. We will be interested to see and to compare the results of the model to our predictions. Once we obtain a numerical version of the *agreement* and, this one is used as a tool to simulate the behavior of transfers faced with the probability of punishment's behavior[32]. To analyze the properties of an optimal *agreement* we focus on the level of transfers and the effects of a punishment system, which depends on the *T* and *t*. Our numerical analysis shows the results vary with the initial conditions. In fact, the simulations reported suggest that these results depend on the first-order stochastic dominance[33].

We consider two possible results for the leader: one high reputation (R=3) and the other low reputation (r=1). The probabilities with which they occur depend on the agent's effort and a random state variable. On the other hand, the agent can only choose between high h and low l. Let $P(R|h) = p_R = 0.8$, and $P(r|l) = p_r = 0.78$. The agent's utility function assumed is of the form:

[32] The constrained minimization problem is solved using the constrained minimization routine *fmincon* from MATLAB's optimizations toolbox.

[33] We say that a lottery A dominates B in the sense of first-order stochastic dominance, if the decision maker prefers A to B regardless of what his utility function is, as long as it is a weakly increasing (For a more detailed definition of this concept, to see MIT OPENCOURSEWARE (2010) and BISMAS (1997)).

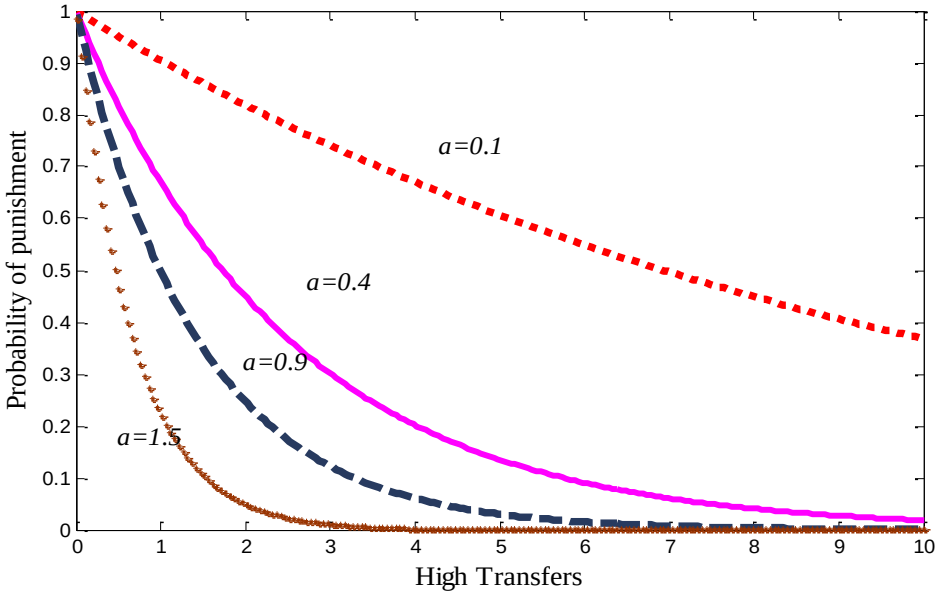
$$u(.) = \begin{cases} T^{0.98} \\ t^{0.9} \end{cases} \quad (1)$$

and value one represents the fixed cost of not deserting. The function costs depend on the effort level:

$$c(.) = \begin{cases} 1 + h^2 \; with \; h = 0.1 \\ 1 + l^2 \; with \; l = 0.01 \end{cases} \quad (2)$$

where the probability of punishment is defined by the function $\rho(T) = e^{(-a)T}$. For different values of *a*, the behavior of this function is shown in Figure 16.

Figure 17 - Probability of Punishment for Several Values of "a"

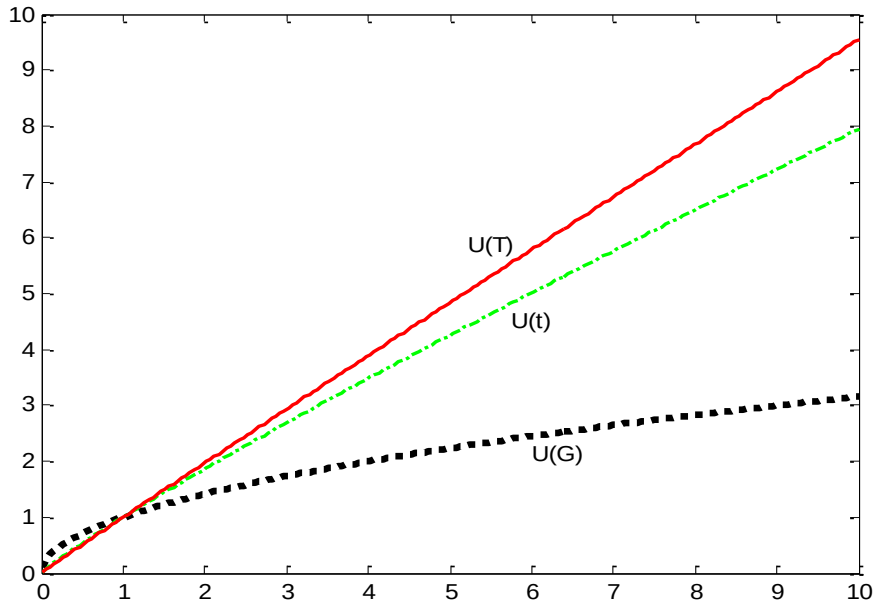


Source: Elaborated by the Authors (2013).

We chose the parameter a = 0.9 because in spite of the fact that the probability of punishment is a function of the transfers, we are looking for values of *T* above *R*, that lead to a probability of punishment close to zero.

The punishment amount is set to *s* =1, and the government reward is *G* = 0.5, with a value less than *r* and the agent's utility of *G* is $G^{0.5}$. Figure 17 displays the three agent's functional forms for *T*, *t* and *G*, respectively.

Figure 18 - Utility Function of the Agent

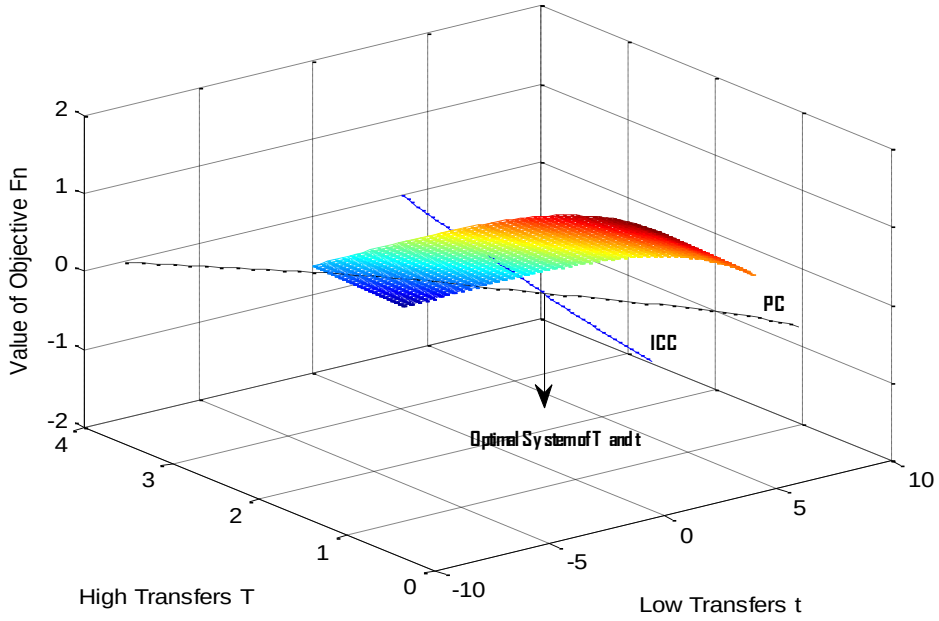


Source: Elaborated by the Author (2013).

The reasons for this choice are as follows: The slopes of these functions fulfill the $u_T > u_t > u_G$ condition for all greater values than one. In intuitive terms, the agent, because of his knowledge and expertise, gains a higher utility from fighting activities than from the other ones, making the government's rewards less attractive than the leader's transfers.

Figure 18 displays the behavior of leader's objective function as a decreasing relation to high and low transfers, *T* and *t*, respectively. It also displays the incentive constraint and participation constrain and, the optimal system of transfers.

Figure 19- Objective Function of the Leader, Incentive Compatibility Constraint (ICC) and Participation Constraint (PC)



The behavior of Leader's Objective Function and ICC and PC for the following parameters:

R =	r =	p_R =	p_r =	a =	h =	l =	g_1 =	g_2 =	k =	G =
3	1	0.8	0.78	0.9	0.1	0.01	0.98	0.9	0.5	0.5.

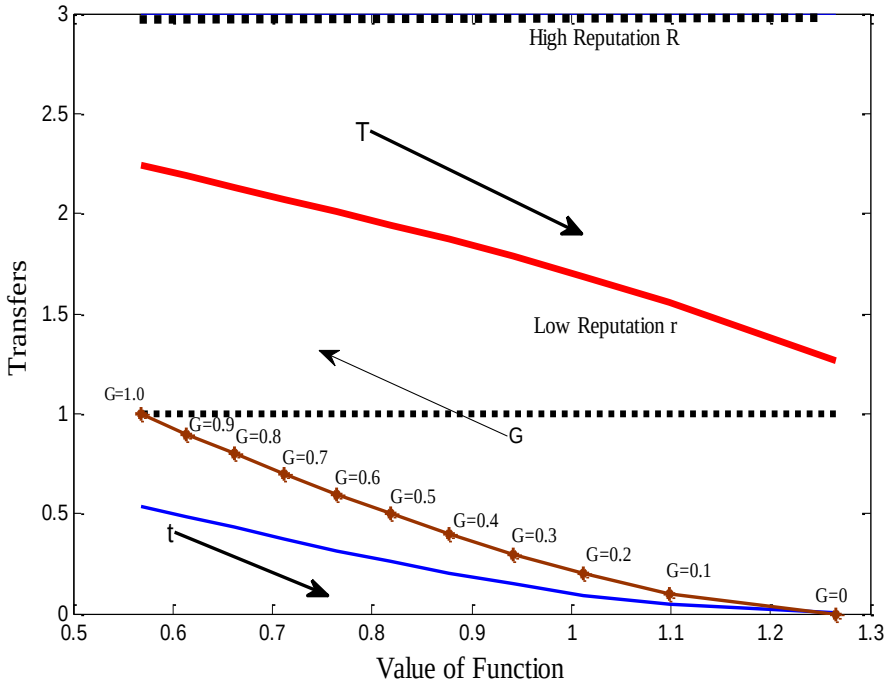
Source: Elaborated by the Author (2013).

Figure 19 displays the relationship between transfers, government rewards and the value of Leader's objective function, and resumes the main results of principal-agent model for a given set of parameters. The *T* and *t* lines show the optimal transfers for each one of the government values and the other fixed parameters. In absolute terms, as *G* is increasing, *T* and *t* grow.

By comparing the growth rates of *T* and *t*, respectively, it is clear that *t* grows at a faster rate than *T*'s. Figure 19 also indicates that the introduction of G in the model raises the incentives, making the agent a residual claimant. It is interesting to note that for *G* values between 0 and 1, *t* value changes at a similar rate to *G*, while *T* grows at much slower rate that *G*'s. That is, at the margin, incremental spending of *t* is greater than *T* and it could encourage agents not to desert, but to provide instead a low effort.

The inclusion of a self-enforcing mechanism in the leader's objective function could stop the desertion, but it would be pushing agents toward low efforts. The increase in *G* above 0.5 leads to the lowest percentage increments of *T* and *t*.

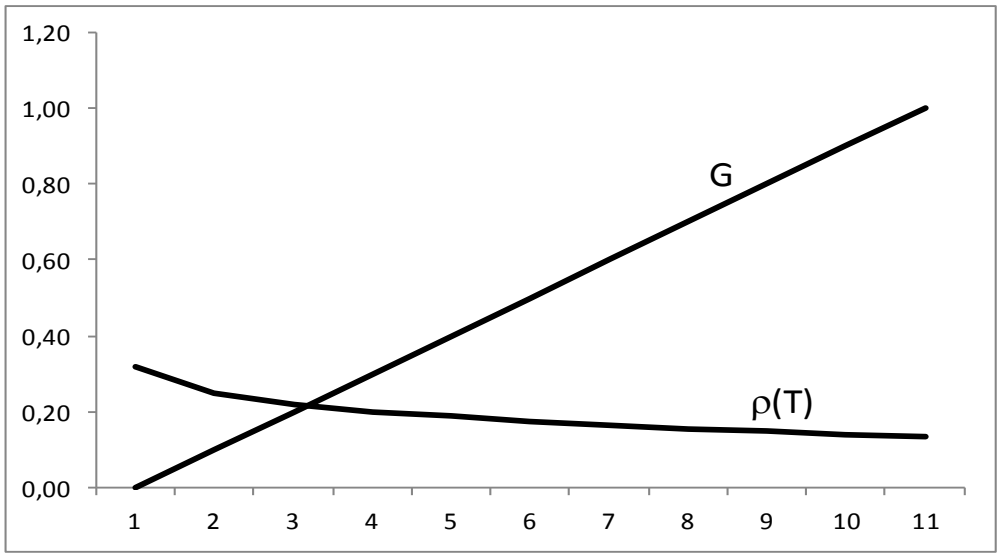
Figure 20 - The Relationship between Transfers, Government Rewards and the Value of Leader's Objective Function



Source: Elaborated by the Author (2013).

Figure 20 displays *G* and the self-enforcing mechanism's behavior for eleven values of *G*. The probability of punishment decreases as *G* increases.

Figure 21 - G and the Self-Enforcing Mechanism ρ(T)



Source: Elaborated by the Author (2013).

Table 7 - Summary of the Results of the Model

T*	1.27	1.56	1.69	1.79	1.87	1.94	2.01	2.0.7	2.13	2.19	2.24
t*	0.01	0.05	0.09	0.16	0.20	0.26	0.32	0.37	0.43	0.48	0.53
G	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Prob.	0.32	0.25	0.22	0.20	0.19	0.17	0.16	0.15	0.15	0.14	0.13
Value of Function	1.27	1.10	1.01	0.94	0.88	0.82	0.76	0.71	0.66	0.61	0.57

Source: Elaborated by the Author (2013).

Again, Table 7 reflects the values of optimal transfers and the probability of punishment. Such simulation was made for discrete eleven values of *G* between 0 and 1.0. With $a = 0.9$ and $G = 1.0$, the agent is almost a residual claimant to the leader's reputation. With $G = 0$, the high transfer is just over *r*. In intuitive terms, when the government increases his offerings, the principal must increase the compensations to the agents in order to avoid their desertion from the organization and, therefore, principal's value of function will fall. In this case, he principal will be more obligated to share his benefits more equitably, breaking away with the idea that the agents are ideologically and purely committed to the organization.

4.5 One extension: Two principals and an agent

In this section we present an interesting extension of this work would be developed further, a game with the government as an active player. We propose a sketch of that game with the objective of showing the direct competition between leaders for the agent.

According to Sinclair-Desgagné (2001) a common agency occurs when two or more principals have a stake in the action of a particular agent. They will try to influence the agent's actions, and he will thus face a set of separate *agreement*s, each one being designed to align the agent's preferences with those of a chosen principal. First, as shown by Dixit (1996) when principals are competitors with different objectives, they each will try to encourage the agent to obey their directions. We are interested in showing a scenario in which this type of competition occurs. We have a government and an AIO competing for an agent to become their exclusive member. More specifically, the government is interested in encouraging agents to desert from the AIO, meanwhile the AIO tries to persuade agents –through incentives and a self-enforcing mechanism— to stay in the organization. The benefits for the

government are represented by the information that can be extracted from deserters, thereby becoming more effective in the fight against the AIO.

We assume that the agent is an active member of the AIO and must decide which principal to "work" for. That means he will choose whether to stay with the same organization or to desert. In the latter case, he will go to "work" for the government. In both cases the agent will choose an *agreement*, and an effort level that, in the case of government, it will stand the type of information about his organization the agent could deliver to him. The effort along with the agent's productivity determines the reputation of the principal, which acts as an input. The reputation level is publicly observable, whereas only the agent knows the accuracy of information hold about his organization and his effort.

In order to differentiate the principals we assume, as in Biglaiser and Mezzetti (1993), that average unit productivity as per the agent's effort decreases for the AIO and remains constant for the government; conversely the government's marginal productivity is higher than that the AIO. These assumptions imply that agents with low skills generate a greater average reputation when working for an AIO, while high skill types yield a greater average reputation when doing so for the Government. The high skill types can be identified as middle-ranking agents who have strategic information about the AIO.

These two problems have different objective functions, but the same restriction structure and define a game between the principals for the agent's allegiance. We assume that compatibility constraints are strictly binding. This implies that the principals would like to see the agent to put considerable effort into achieving the assigned *t*.

4.5.1 Two-principal-agent model

Let consider a multistage game as a finite sequence of a one-shot *agreement* between a principal and an agent (Figure 22). These stage-games are played sequentially by the same players, and the total payoffs from the sequence are evaluated using the sequence of outcomes in the games that are played. We adopt the convention that each game is played in a distinct period, so that leader-agent game is played in period *t*.

Depending on agent's actions from game 1, they define a second game either leader-agent or deserter-government. In terms generals, a leader *L* of an AIO and a government *G* compete for the services of an agent *A*, who is an active member of the AIO via an incentive *agreement*. The agent *A* may work for only one of them and may provide to the leader with

high reputation R_i and low reputation r_i according to his effort with $i \in \{L, G\}$, respectively. Let *L* be the principal, who tries now to convince agent *A* not to desert and to perform some tasks related to a criminal activity.

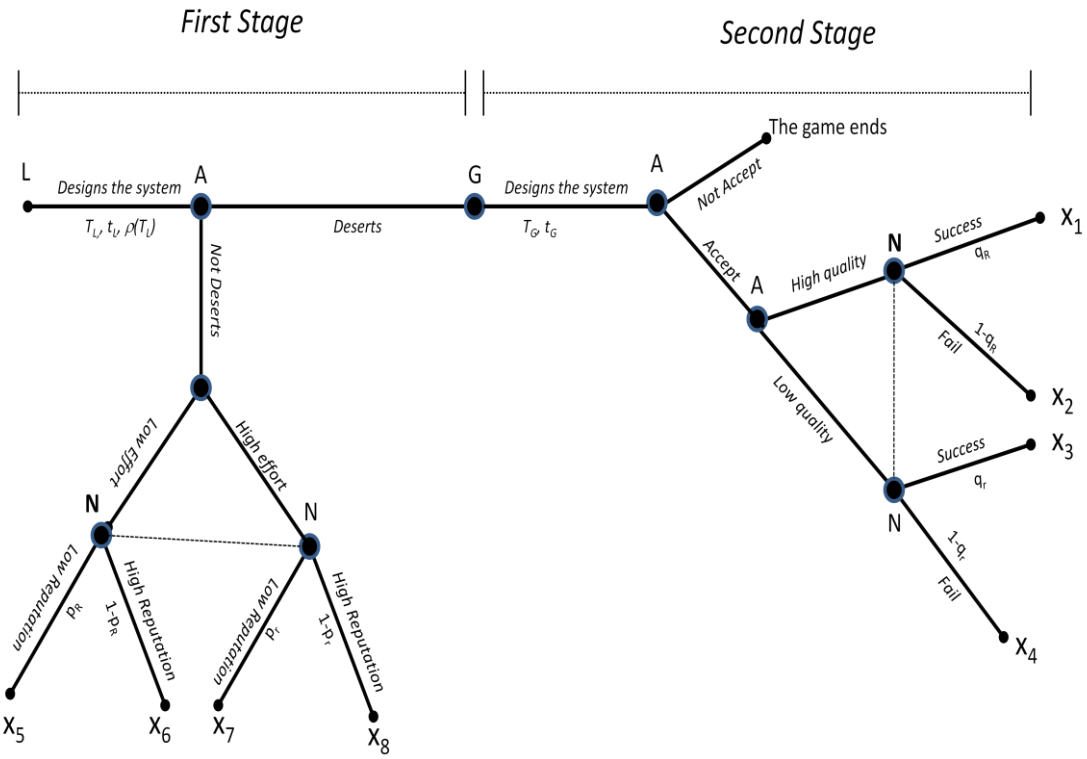
On the other hand, *G* tries to persuade agent *A* to desert and to do a task related providing information about the AIO. Both principals agree to measure performance of assigned tasks and to compensate the agent, only when a specified level of reputation is achieved. As in the one principal model, *A* receives a transfer from principal i when he decides to work for him. In this case, if the reputation level achieved is high (R_i) he pays T_i and t_i if the reputation is low (r_i), with $T_i - t_i > 0$.

The agent can affect the probability of *L* being of high reputation by choosing to perform his task with either high effort (*h*) or low effort (*l*). With high effort the probability of reaching R_L is p_R, and with low effort the probability of r_L is p_r, where $0 < p_r < p_R < 1$. While with high effort the probability of reaching R_G is q_R, and with low effort the probability of r_G is q_r, where $0 < q_r < q_R < 1$.

This model implies that any leader who has a utility function $\pi_i(.)$ with $i \in \{L, G\}$, which is increasing in reputation prefers the stochastic distribution of reputation induced by the high effort level *h* to the one induced by the low effort *l*.

The agent is risk-averse, with a positive, strictly concave, strictly increasing in three times differentiable Von Neumann-Morgenstern utility index *u* defined over transfers.

Figure 22 - Timing of Two Principals – Agent Game



Source: Elaborated by the Author. L: leader; A: Agent; G: Government; N: Nature; $X_1,\ldots,X_8$ stand possible results for both players (2013).

Two principals are endowed with different technologies which allow them the use of agent's effort to obtain their benefits.

$$\pi_i(h) = \beta_i[R_i p_R + r_i(1 - p_R)] + V_i - E_{hi},$$
$$\pi_i(l) = \beta_i[R_i p_r + r_i(1 - p_r)] - E_{li}$$

With $i = L,G$. $\beta_G > \beta_L > 0$ are productivity parameters and $V > 0$ when $i = G$, 0 in otherwise. Parameter V represents an extra amount of added value for the government of winning a deserter independently of his skills. In this case, the agent who agrees to work for the Government provides him two services. The first service results in the value added of A, while the second in the value added r_G. We assume agents are active members of an AIO and they have particular knowledge and skills related to the performance of illegal activities.

The benefit functions show how valuable agents can be for each of the principals. The marginal productivity of Leader, r_L, is always greater than the marginal productivity of G, r_G.

Formally, the incentive system that the leader proposes is the solution to the following problem:

$$\min_{T,t} \beta_L \left[p_R \pi(R_L)\right] - T_L - \rho(T_L, j)s$$

$$p_R u(T_L) - c_L(h,k) \geq (1 - \rho(T_L, j))(q_R u(T_G^*) + (1 - q_R)u(t_G^*) - c_G(h,k)) \tag{9}$$

$$(p_R - p_r)\big(u(T_L) - u(t_L)\big) \geq c_L(h,k) - c_L(l,k) \tag{10}$$

Similarly, the Government resolves the following problem:

$$\min_{T,t} q_R \left(\pi(R_G) - T_G\right) + (1 - q_R)(\pi(r_G) - t_G) + \beta_G V$$

$$q_R u(T_G) + (1 - q_R)u(t_G) - c_G(h,k) \geq 0 \tag{11}$$

$$(q_R - q_r)\big(u(T_G) - u(t_G)\big) \geq c_G(h,k) - c_G(l,k) \tag{12}$$

The timing of the two principals-one agent game is the following: First, the principals simultaneously offer the agent a menu of incentive systems. The agent chooses which, if any, principal to work for, and an *agreement*.

An equilibrium for this game is achieved as each principal chooses the incentive system that maximizes his expected benefit, given the menu of systems offered by the other principal and the equilibrium of agent's actions. He chooses an incentive system and an effort level that maximize this utility.

The principals are risk neutral. We start to resolve that game like a subgame on the second stage. Given the Leader's incentive transfer T_L^*, the principal *G* would set his optimal system T_G^*, t_G^* in order to

$$\max_{T_G, t_G} q_R \left(\pi(R_G) - T_G\right) + (1 - q_R)(\pi(r_G) - t_G) + \beta_G V$$

$$q_R u(T_G) + (1 - q_R)u(t_G) - c_G(h,k) \geq 0 - \rho(T_L^*)s \tag{11}$$

$$(q_R - q_r)\big(u(T_G) - u(t_G)\big) \geq c_G(h,k) - c_G(l,k) \tag{12}$$

Where the expression $\beta_G V$ stands the added value for G of gaining deserters from L. β_G could be a measure of the number of deserters over estimated population of agents of L. In intuitive terms, the previous expression displays the benefits that G makes from having a high number of deserters. It implies to have greater information about how the illegal organization works and its operations, in order to create policies and mechanisms to counteract it.

4.6 Conclusions

This essay examined theoretically, through a principal-agent model, the nature of the *trade-off* between incentives and enforcing mechanisms that an AIO's leadership offers to its agents.

First, that model focused on both the expected benefits and costs for those who decided to stay with or defected from the armed organization, in an uncertain context in which desertion was encouraged by the government which was pushing incentives aimed at fostering individual agents' demobilization. The presence of this external agent, could lead to agents to have an opportunistic behavior and an increment of agency costs for the principal. That is, the agent will stay in the armed organization when the leader was willing to share his risk to a level high enough to improve the agents' future benefits to a point where they outweigh the costs incurred by not deserting. The contribution of this model, from the principal's side was to incorporate the risk of being punished as a function of the incentives offered by the principal when the government was actively encouraging desertion. Seen from the agent's side, he had no direct mechanisms to enforce the agreement but he had credible threats like the desertion. Both behaviors were considered rational within a context of asymmetric information and the agent-principal model.

Given that the leader couldn't know what his agents were doing on the ground without being there himself, or increase the resources dedicated to monitoring the agent, he created an enforcing mechanism that will ensure, with some probability, the agent's compliance with the

agreement. Such mechanisms or the risk of being punished was a function of the incentives offered by the leader. An important conclusion was that as the AIO's resources are scarce, large incentives offered to agents who decided to stay in the organization, were detrimental to the AIO's capacity of punishing deserters, and decreased the leader's utility in the operation increasing his risk and increasing the cost of operation.

Finally, by using a MATLAB's optimizations toolbox, we computed the optimal transfer system for a given parameterization of the model and analyzed its properties. The numerical analysis showed that the inclusion of a self-enforcing mechanism on the leader's objective function increased the costs for the principal and could lead an agent to choice low efforts and engage them in opportunistic behavior. That is, whether the principal increased the probability of punishment deserters, which will be at expenses of offering low incentives to agents, then, the principal will get an agent's low effort. The presence of external agent increased the cost of *trade-off* between incentives and punishment and improves the agent's situation. If he decided no deserting, he'll get high transfers despite he was making a low effort.

5 CONSIDERAÇÕES FINAIS

O objetivo principal desta tese foi responder a seguinte pergunta: Como o sequestro afetou a estrutura organizativa das FARC? No fim da primeira década dos anos 2000 houve uma marcada redução da taxa de sequestros na Colômbia, vista até agora como o resultado de uma política governamental exitosa. No entanto, outros elementos, como uma alta taxa de deserção dos membros das camadas mais baixas da organização, uma queda no nível de efetividade de seus combates e sua decisão de parar o sequestro, motivaram minha procura por uma explicação complementária a partir do uso dos instrumentos de análise da teoria econômica, mais especificamente da teoria da agência.

O trabalho foi dividido em três ensaios que usaram o enfoque formal do principal-agente para especificar as condições sob as quais o sequestro político que praticou uma organização armada ilegal determinou e moldou as novas relações entre seu líder, que determinava as tarefas a serem realizadas, e os agentes, que as acatavam. Tudo isso acontecia em um contexto de informação assimétrica, em que o principal devia monitorar as ações dos agentes para evitar um comportamento contrario aos seus interesses.

Cada um dos ensaios tentou mostrar, a partir de diferentes ângulos, as razões que levaram a organização a renunciar ao sequestro. Tendo como ponto de partida que o sequestro ampliou a brecha de interesses entre o principal e o agente, no primeiro ensaio se identificaram os custos que gerou para ambas as partes a decisão de sequestrar e manter prisioneiro um grupo de reféns por muitos anos. O segundo ensaio mostrou de três perspectivas diferentes, mas complementares, como essa mesma estratégia afetou as preferências dos agentes, que eram os encarregados de custodiar os reféns. E no terceiro ensaio se expôs um modelo formal para determinar um sistema eficiente de compensações que o principal podia oferecer ao agente para atenuar em parte os efeitos dessa estratégia sobre seu comportamento e persuadi-lo a não desertar da organização.

Embora meu interesse em analisar e estudar o comportamento destas organizações ilegais subversivas tenha seguido a mesma direção da motivação que subjaz aos estudos sobre as organizações terroristas, a diferença deste trabalho em relação aos outros é que se focou no estudo dos dilemas organizacionais, fruto da imposição de uma ação criminosa alheia às ações às que estava acostumada a organização, com efeitos diferentes para cada um de seus membros. Ou seja, foram analisados os problemas de informação e de coesão que enfrentou a organização, como resultado das decisões que o principal tomou de forma isolada, ao supor

seu controle absoluto sobre a mesma, e que impôs aos agentes que estavam obrigados a cumpri-las. Usando a literatura existente sobre o sequestro das FARC se pode estabelecer que certas ações criminosas afetaram mais que outras as expectativas dos envolvidos diretamente nelas, aumentaram os custos e comprometeram as interações entre os líderes e os agentes. Obrigando, de quebra, o principal a mudar de estratégia para parar os efeitos negativos que estava suportando a organização e que estava gerando uma brecha cada vez maior entre seus objetivos e os dos agentes.

O objeto do estudo foi o grupo insurgente FARC – Forças Armadas Revolucionárias da Colômbia –, durante o período em que manteve sequestrado um grupo de figuras políticas e agentes a serviço do estado (2000-2010), como sua estratégia de longo prazo para exigir do governo colombiano benefícios políticos, contrastando as consequências dessa decisão com sua possível relação com o alto número de membros que desertaram da organização nesse período. Vamos esboçar alguns dos resultados mais importantes do trabalho, divididos por ensaio.

O primeiro ensaio contribuiu com a identificação de dois efeitos que surgiram da decisão das FARC de tornar o sequestro político sua estratégia de longo prazo: Primeiro, a diferença entre os interesses dos líderes e dos agentes da organização e, segundo, a relação emergente entre sequestrados e agentes. Vista a atividade do sequestro como uma atividade qualquer, no sentido de requerer um planejamento estratégico, com um custo de oportunidade e um custo de execução traduzidos em um custo de transação, a analisamos com os mesmos instrumentos teóricos da teoria econômica, usados para a análise de qualquer atividade econômica que empreenda uma organização legal ou uma firma.

O primeiro ponto foi supor que essa atividade acarretou custos de transação. Estes custos foram divididos em variáveis e fixos. As variáveis foram, por sua vez, subdivididas em custos de oportunidade e custos de execução da atividade. Estes custos, embora sejam não observáveis, foram equiparados à diferença entre o valor do bem que a organização queria intercambiar (os sequestrados) medido em termos das demandas políticas ao governo (custo do impacto), e o preço real de execução (o custo temporal), influenciado por fatores externos, como foi a forte pressão do exército colombiano, a presença de intermediários para obter uma rápida liberação e as externalidades que geraram na organização as alianças entre sequestrados e agentes que os custodiavam, expressadas em tentativas de fuga de alguns reféns ou em um excessivo maltrato que fez com que alguns reféns morressem em cativeiro. Em razão do incremento dos custos temporários, devido ao aumento do tempo de cativeiro

sem que o governo propusesse uma solução negociada, o que também gerava uma maior brecha entre os interesses do principal e do agente, altos custos de agência emergiram para ambos os membros da organização.

A partir do esboço do modelo principal-agente, se apresentaram as alternativas de compensação com as quais contou o primeiro para mudar o comportamento do agente e como a utilidade deste foi afetada. Finalmente, usamos a taxa de deserção dos membros da organização como uma proxy dos custos de agência, e encontramos algumas correlações entre esta taxa, os sequestros e a diminuição na atividade de combate da organização.

No âmbito empírico a principal limitação deste ensaio se encontrou na ausência e indisponibilidade de dados específicos sobre o sequestro político das FARC. Não foi possível estimar os verdadeiros custos econômicos e de transação do sequestro para a organização, a estimativa foi teórica e se apoiou muitas vezes nos relatos que os sequestrados fizeram depois de sua libertação e em algumas declarações dos agentes que desertavam da organização. A construção de uma base de dados, com fontes primárias, poderia ser um tema de pesquisa futura neste campo.

A contribuição do segundo ensaio esteve em usar três diferentes perspectivas a partir da teoria econômica para explicar as diferenças entre os interesses do principal e do agente, mas focando neste último. Expuseram-se em cada caso os fatores relevantes que determinaram sua forma de atuar diante do sequestro. O primeiro enfoque estudou o balanço entre riscos e recompensas que os agentes conheciam quando decidiram fazer parte de uma organização armada. O segundo enfoque procurou estabelecer que os agentes tinham dois tipos de preferência: subjacentes e induzidas e o que, dependendo de como interpretavam a nova informação, isto iria determinar em suas preferências induzidas, suas escolhas e ainda se seriam muito diferentes das do principal. Para ter uma análise mais formal do caso de estudo, o terceiro enfoque se baseou na teoria de Dietrich e List (2011). Mostrou-se como, no caso dos agentes, as mudanças nas preferências tiveram origem na presença de dimensões motivacionalmente salientes, definidas como espaços inconstantes nos quais os agentes avaliam suas decisões. As limitações deste segundo ensaio estiveram determinadas pela impossibilidade de contar com os dados que permitissem provar as hipóteses sobre as preferências dos agentes. Isto requereria a elaboração de uma entrevista que incluísse combatentes e ex-combatentes (desertores) das FARC e seus ex-sequestrados. Embora tenham se apresentado relatos que sustentavam como o comportamento dos agentes ia mudando, estes

acabaram sendo insuficientes para a análise por só considerar a visão dos ex-sequestrados e não a dos agentes envolvidos mais diretamente nas atividades citadas.

No terceiro ensaio, através da construção de um modelo de principal-agente, se examinou teórica e computacionalmente (para um conjunto específico e arbitrário de parâmetros) o *trade-off* entre incentivos e mecanismos de autocumprimento (*enforcement*) das tarefas encomendadas ao agente pelo principal, com a presença de incentivos externos à relação estabelecida entre eles. O mecanismo do *enforcement*, ou risco de ser penalizado, foi uma função dos incentivos oferecidos pelo principal. Com recursos escassos, grandes incentivos oferecidos ao agente para que não desertasse da organização, provocariam o detrimento da capacidade de penalizar os desertores e decresceria a utilidade do principal. Do ponto de vista computacional, para esse conjunto de parâmetros, se concluiu que a inclusão desse mecanismo na função objetivo do principal aumentou seus custos. Talvez não tenha sido eficiente porque, embora incentivasse a permanência na organização, não incentivava que o agente fizesse seu melhor esforço. Para uma investigação futura se sugere a análise computacional do modelo de dois principais que já se esboça neste capítulo, com o fim de comparar seus resultados com os obtidos quando só se tem um principal.

Em termos gerais, podemos notar que, tanto do ponto de vista teórico como do empírico, a investigação em teoria econômica direcionada ao estudo dos sequestros de longa duração a partir das características organizacionais dos grupos armados ilegais tem sido escassa. Esta tese e seus ensaios se constituem como uma contribuição pequena, mas original, para o tema das organizações armadas ilegais dentro do marco teórico das escolhas racionais e da teoria da agência, estudando mudanças nas escolhas de suas atividades criminosas como o resultado dos efeitos sobre sua estrutura organizacional, seus membros e seus custos.

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