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Scenarios for Sustainable Peace in Colombia by year 2019

By Gustavo Alejandro Gómez-Sorzano*

Abstract: This paper presents the simulation results of the model of cyclical terrorist murder for Colombia (Gómez-Sorzano, 2005) on the purpose of doing sensitivity analysis to help the country in the design of a policy bringing sustainable peace before year 2019. The first part presents 11 scenarios 2005-2010. The final section shows 18 additional scenarios 2006-2019. According to them peace will be attained around year 2008 and *sustainable peace* will be granted before year 2019.

Keywords: Colombia, cyclical terrorist murder, democratic security policy, sustainable peace.

JEL classification codes: C22, C53, D63, D74, D78, H42, H56, K42, N46, O54.

DRAFT (September 22nd, 2006): DO NOT CITE OR QUOTE WITHOUT PERMISSION.

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Scenarios for peace 2005-2010, Second presidential period Dr. Alvaro Uribe.

Introduction.

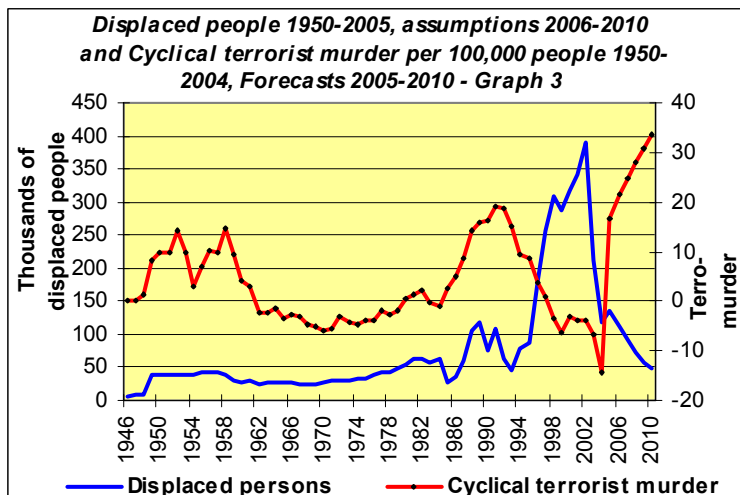
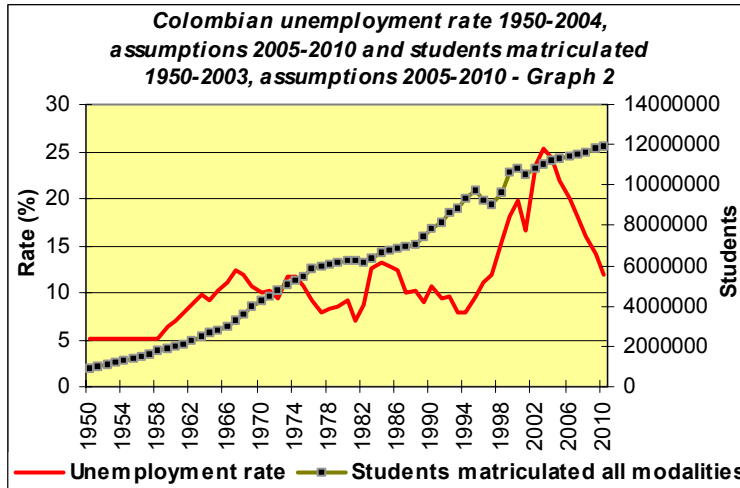
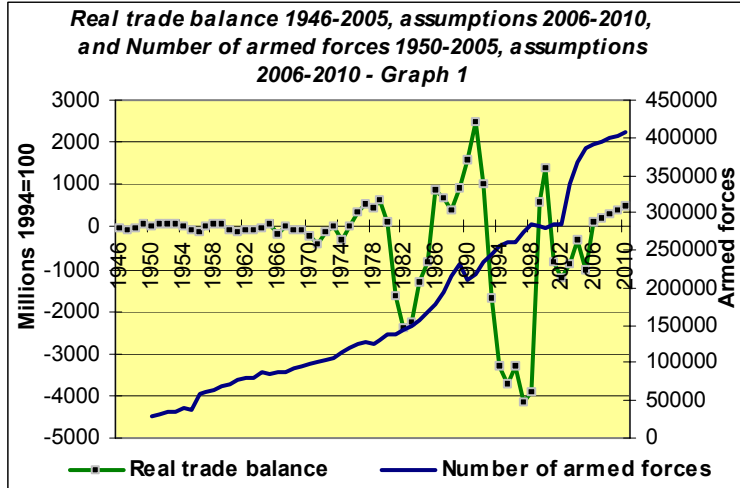
The first section presents 11 scenarios that show the forecasting capability of the Model of Cyclical Terrorist Murder (Gómez-Sorzano, 2005). Each scenario is accompanied by the assumptions for the independent variables feeding up the model up to year 2010. The final section concludes using the model again to produce forecasts and 18 additional scenarios up to year 2019.

Each of the 29 scenarios assume that up to year 2010 and 2019 the country is not having additional outburst of violence as the one experienced in 1948 (so the independent dummy variable B for *Bogotazo* continues with the value of zero up to 2010 and 2019), and after the second presidential period of Dr. Alvaro Uribe the country starts again the alternation in power every 4 years (so the dummy CL1 for National Front years becomes 1 in 2002 up to 2010 and 2019). I want to warn the reader about the big jump in terrorist murder for year 2005 which is shown in all of the scenarios presented; this is as a consequence of the immense efforts realized by the government at reducing displaced people during the last years. The model shows statistically the strong inverse relationship between terrorist murder and displaced people, a situation that shows the big dilemma facing Colombian policy makers¹.

SCENARIO 1 – An increase in army troops boosts terrorist murder. Assumptions

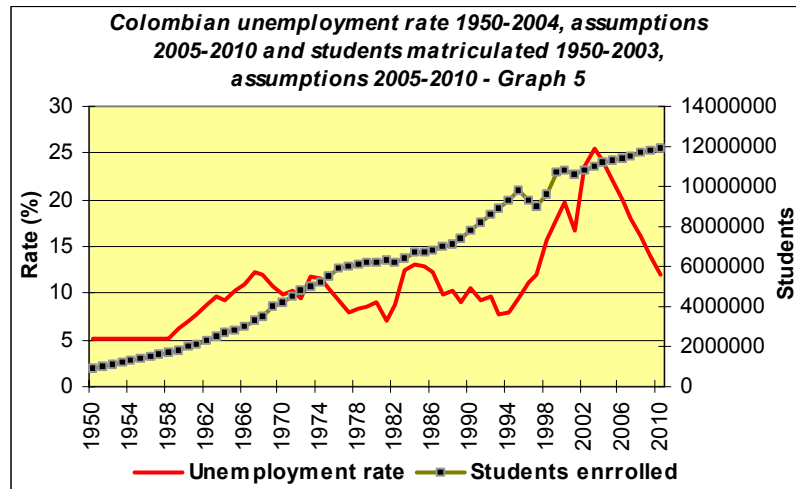
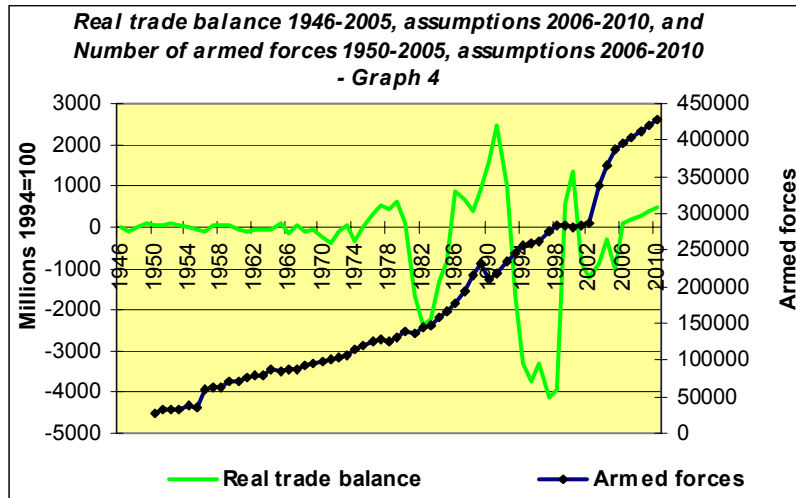
The real trade balance becomes positive for 2006 starting at 100 millions of pesos ending up by 2010 at 500 millions; the total armed forces continues growing annually at 1% from 2006 forth; the number of displaced people follows the trend estimated by the National Planning Department (DNP); the unemployment rate continues its declining tendency, in this case diminishing 2% annually from 2004 forth; the number of students matriculated grows 1% annually from 2004 forth. The scenario does not do much at changing army forces, and the upward trend in troops joined with the modest reductions in the unemployment rate and displaced people plus the increasing trade balance situation are responsible for boosting the cyclical terrorist murder abruptly again up to year 2010.

¹ All of the scenarios presented in this first section will show this instant jump in terrorist murder due to the fact of the strong reduction in displaced people during the last years. Additionally the scenarios presented are based on the assumption of a continuous declining trend for displacement which is expected and proposed as presidential policy during the next years up to year 2019 (Visión Colombia II Centenario, propuesta para discusión, resumen ejecutivo)



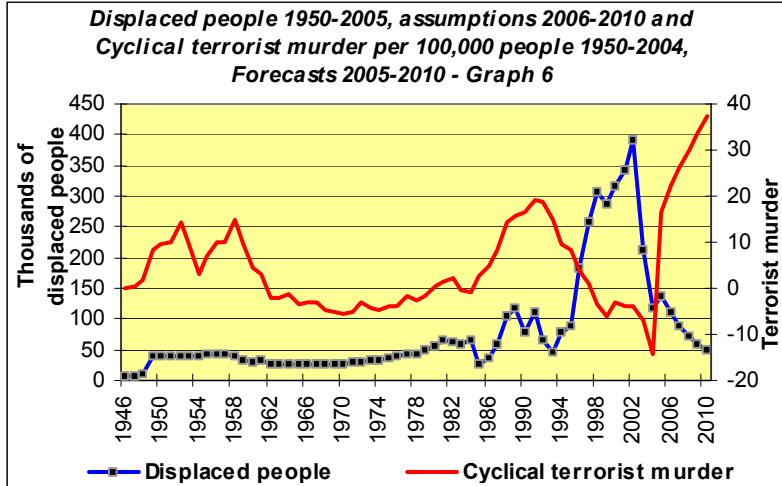
SCENARIO 2 – A further increase in army troops increases the intensity of the conflict.
Assumptions.

I keep the assumption from scenario 1. The real trade balance becomes positive for 2006 starting at 100 millions of pesos ending up by 2010 at 500 millions. In order to learn about the reaction of terrorist murder a further increase in army troops is presented: the armed forces starts growing annually at 2% from 2006 forth²; the number of displaced people follows the trend estimated by the National Planning Department (DNP); the unemployment rate continues its declining tendency, in this case, diminishing 2% annually from 2004 forth; the number of students matriculated grows 1% annually from 2004 forth³. Concluding, terrorist murder increases further.



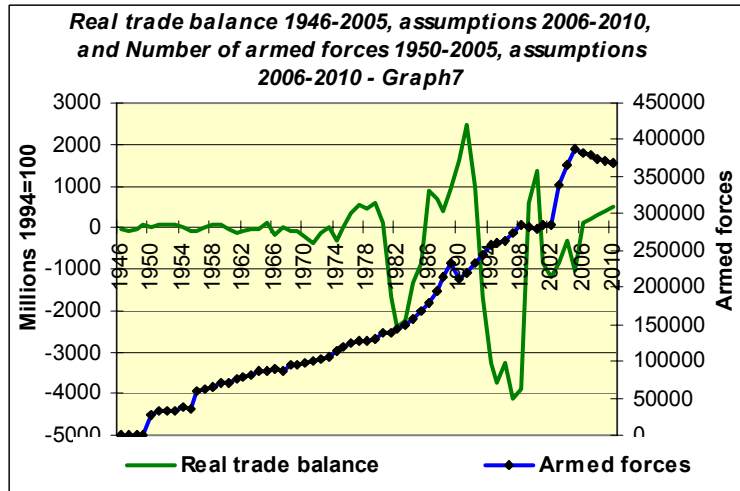
² This is the only variable changing compared to the last scenario. According the model, the positive coefficient for army troops implies that further increases in army will boost the intensity of the conflict.

³ The theoretical model assumes negative coefficients for these three variables, and a positive one for students matriculated. A declining number of displaced people along with declining unemployment rate will be pushing the cyclical murder, while enrollment of students will diminish the intensity of the conflict.

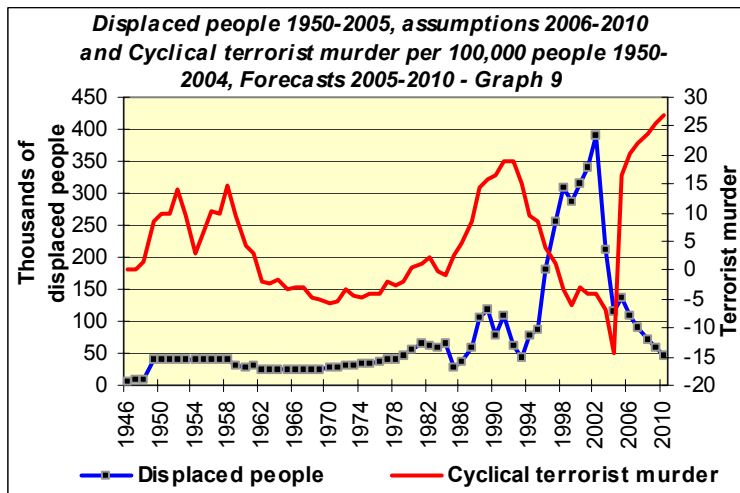
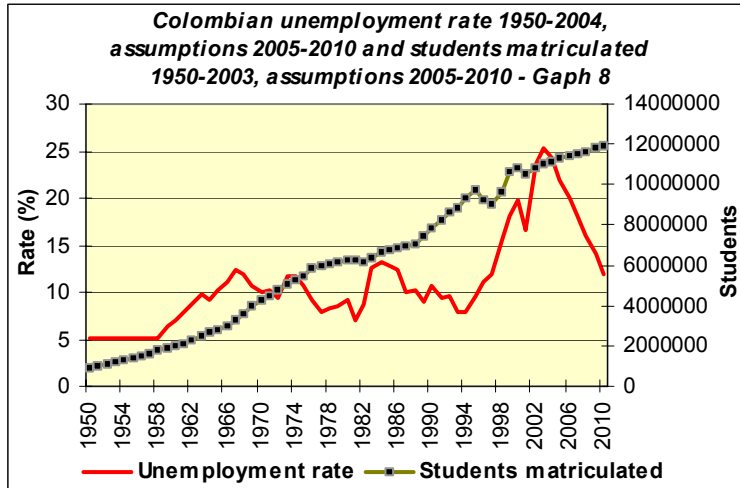


SCENARIO 3 – Small disarmament: reduction in army troops by 1% annually. Assumptions

The real trade balance continues positive for 2006 starting at 100 millions of pesos ending up by 2010 at 500 millions; the armed forces starts diminishing annually at 1% from 2006 forth⁴; the number of displaced people follows the trend estimated by the National Planning Department (DNP); the unemployment rate continues its declining tendency, diminishing at 2% annually from 2004 forth; the number of students matriculated grows 1% annually from 2004 forth. As conclusion terrorist murder reduces according to the disarmament proposed.

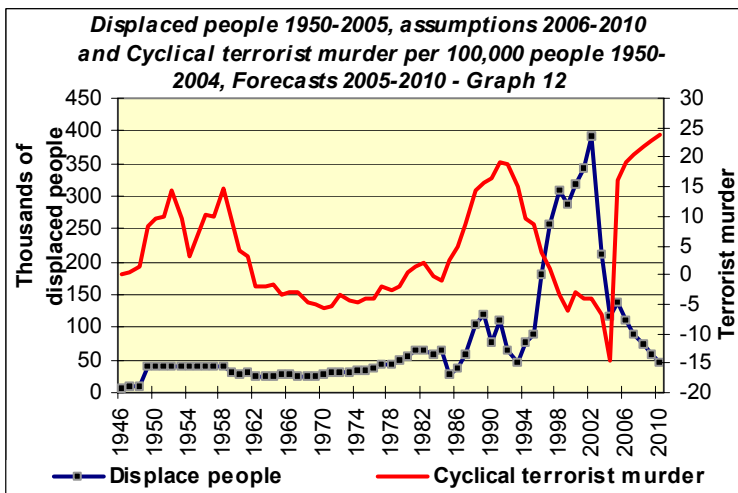
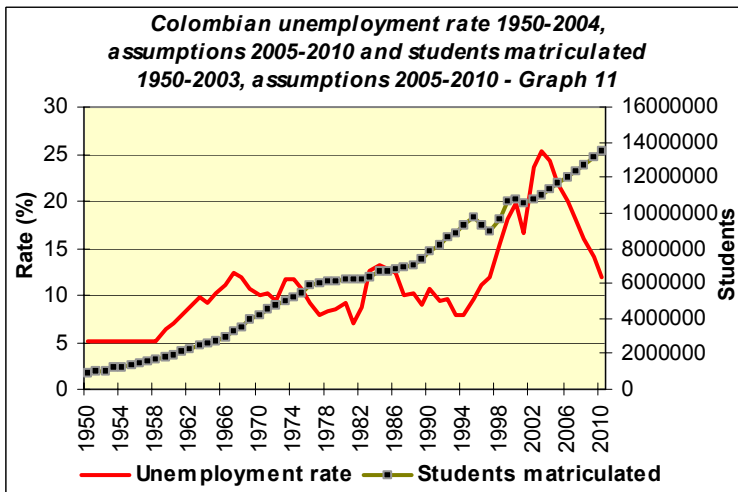
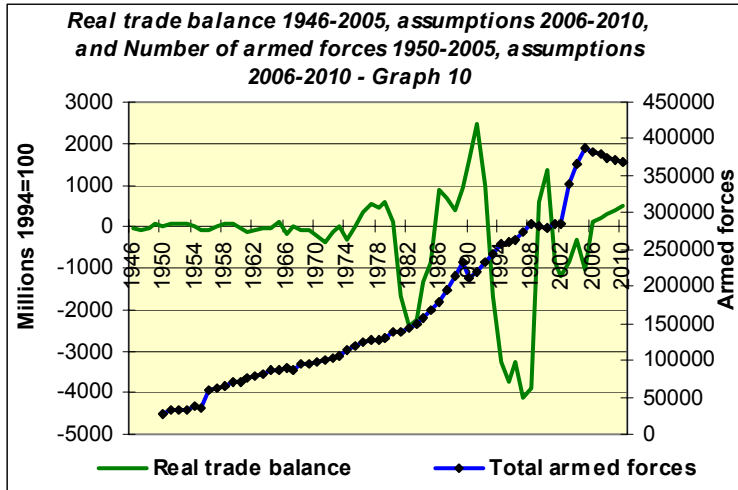


⁴ First scenario which, reduces army troops annually at 1%, its impact is instantly felt in terrorist murder which starts diminishing. The other variables remain the same compared to last scenario.



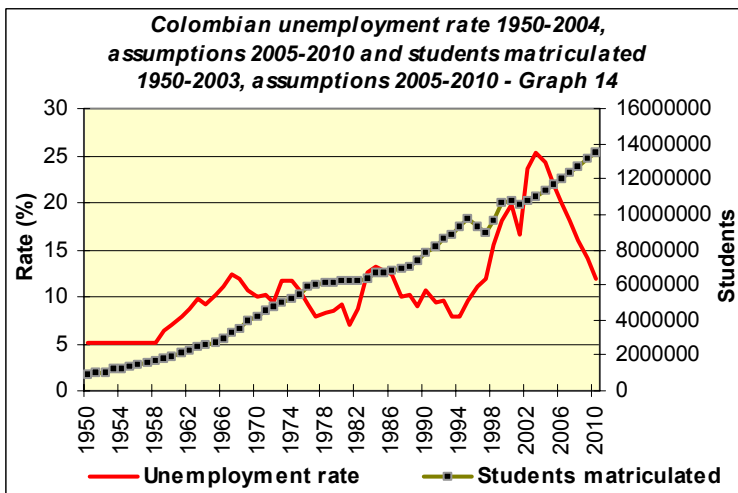
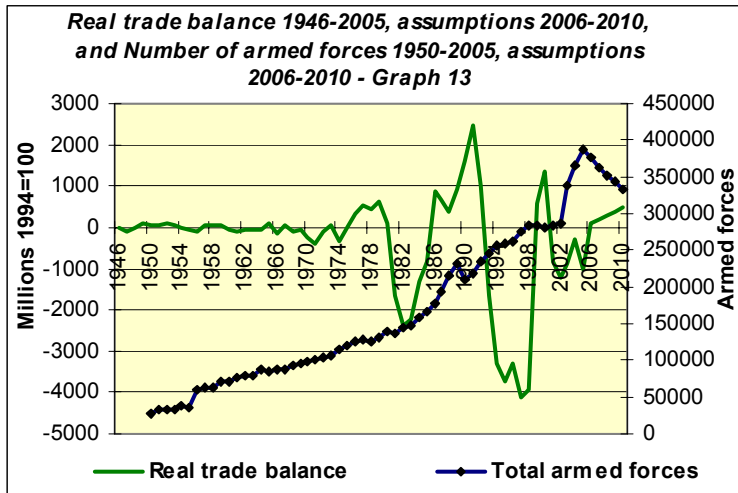
SCENARIO 4 – Social content introduced plus disarmament: students enrolled in all modalities increases annually at 3%, while army forces diminish at 1%. Assumptions.

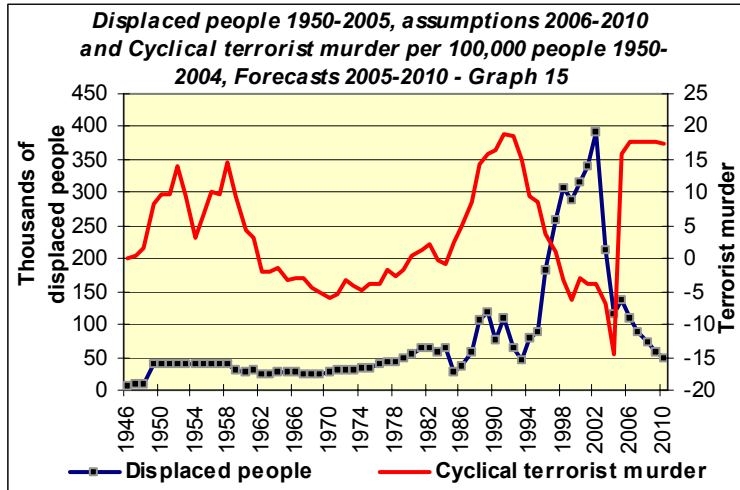
For this scenario I start increasing students matriculated in all modalities at 3% annually from 2004 forth. The other variables remain the same compared to last scenario. The real trade balance becomes positive for 2006 starting at 100 millions of pesos ending up by 2010 at 500 millions; the total armed forces starts diminishing annually at 1% from 2006 forth; the number of displaced people follows the trend estimated by the National Planning Department (DNP); the unemployment rate continues its declining tendency by, in this case diminishing 2% annually from 2004 forth; the number of students matriculated grows at 3% annually from 2004 on. Terrorist murder decreases further compared to last scenario, but still the changes are not sufficiently strong as required.



SCENARIO 5 – Students enrolled increasing annually at 3% and army troops reducing annually at 6% (moderate disarmament). Assumptions

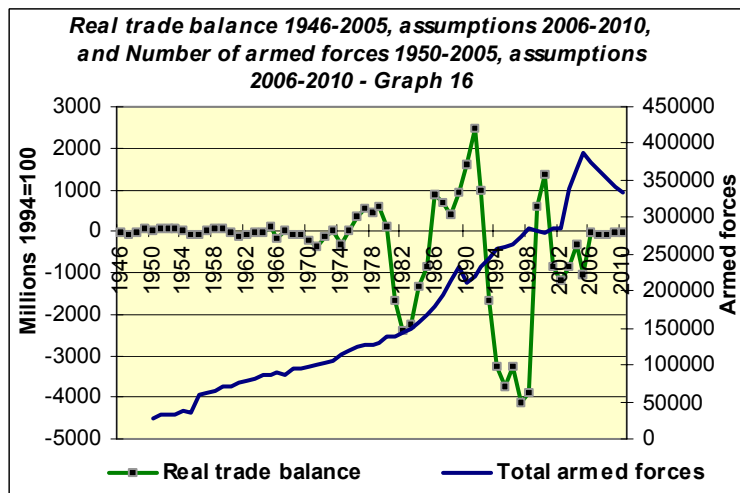
The number of students matriculated in all modalities continues growing annually at 3% from 2004 forth. Additionally the total armed forces start diminishing annually at 6% from 2006 forth. The real trade balance becomes positive for 2006 starting at 100 millions of pesos ending up by 2010 at 500 millions; the total armed forces starts diminishing annually at 3% from 2006 forth; the number of displaced people follows the trend estimated by the National Planning Department (DNP); the unemployment rate continues its declining tendency by, in this case diminishing 2% annually from 2004 forth; the number of students matriculated grows at 3% annually from 2004 forth. As conclusion cyclical murder appears high (17.5 murder per 100,000 people) implying that 2010 is a real short period of time to accomplish results and that further analyses should look for severe changes in the independent variables in order to accomplish tangible results by year 2019.

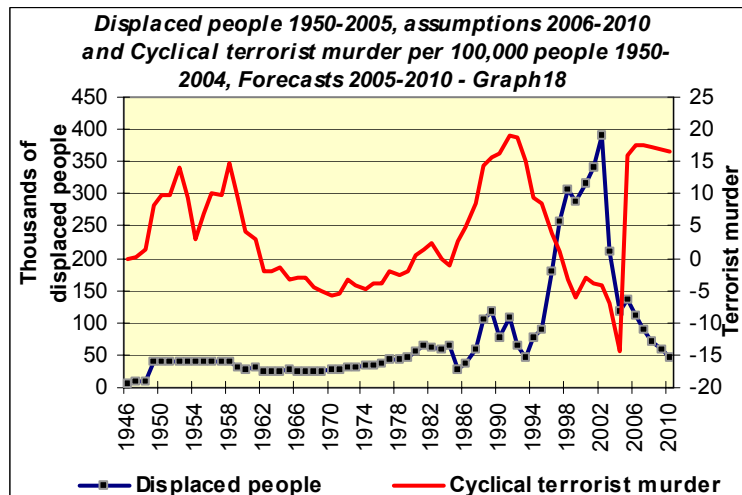
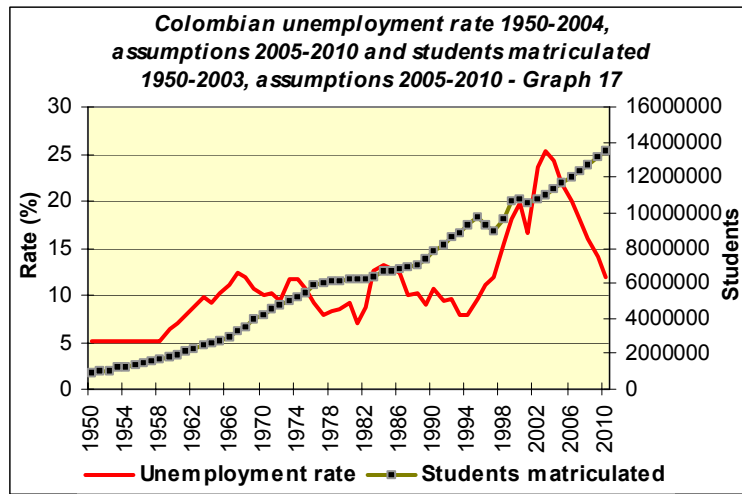




SCENARIO 6 – Modeling the impact of a negative real trade balance.
Assumptions

The only change in this scenario in relation to the last one is real trade balance. I assume the real trade balance is identical to what Colombia experienced during the “*Front National years*”, so starting in 2006 I model the impact of an oscillatory negative real trade balance around small figures. So the model is feed up with the same monetary figures from 1960 to 1964, so for 2006 (-54 millions of pesos), 2007(-64 millions of pesos), 2008(-70), 2009(-59), 2010 (-38). The remaining assumptions are kept: the number of students matriculated in all modalities continues growing annually at 3% from 2004 forth; the total armed forces starts diminishing annually at 3% from 2006 forth; the number of displaced people follows the trend estimated by the National Planning Department (DNP); the unemployment rate continues its declining tendency diminishing 2% annually from 2004 forth; the number of students matriculated diminish at 3% annually from 2004 forth. This scenario reduces terrorist murder by a half percent point compared to last scenario. Again a stronger policy looks is needed to achieve tangible results.





SCENARIO 7 – Figures for army troops identical to those experienced during the National Front years. Assumptions⁵. Concrete results achieved via wrong figures for trade balance, displacement, and unemployment rate.

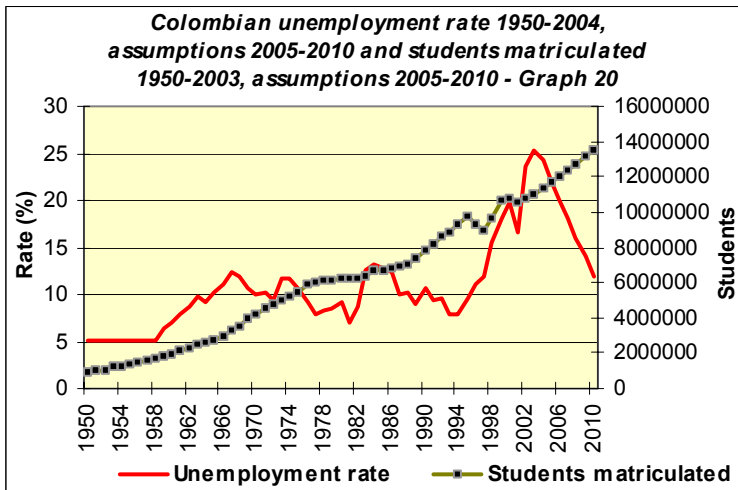
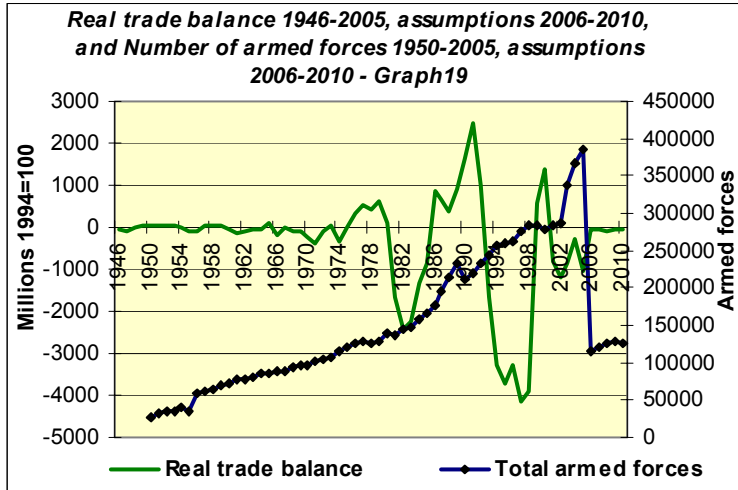
The only change in this scenario is with respect to the last one is army troops. I assume the reduction of army troops to the historical figures that the country experienced during the “National front years”: *the most peaceful time during Colombian political history* (years 1974 to 1978), so starting in 2006 (115,203 troops, corresponds to the figures in 1974), 2007(120,327 figures for 1975), 2008(125,636 figures for 1976), 2009(127,732 figures for 1977), 2010 (126,463 figures for 1978).

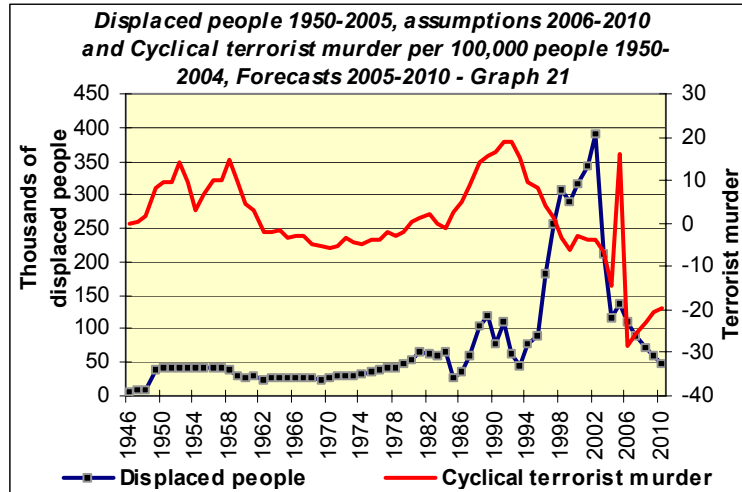
The social content continues: the number of students matriculated in all modalities continues growing annually at 3% from 2004 forth; the real trade balance displays the same small negative results experienced during the 60’s; the total armed forces reduces by a small number

⁵ The scenario shows that a strong reduction in troops reduces terrorist murder per-capita by –28 per 100,000 people instantly by year 2006.

and increases later by a small amount according to what happened during the national front years; the number of displaced people follows the trend estimated by the National Planning Department (DNP); the unemployment rate continues its declining tendency by, in this case diminishing 2% annually from 2004 forth; the number of students matriculated increases at 3% annually from 2004 forth.

As conclusion this scenario produces concrete results reducing terrorist murder by -21 per capita by year 2010, however the results were obtained via consecutive values for trade balance from 2006 to 2010, still a high unemployment rate, and the figures expected for displacement.

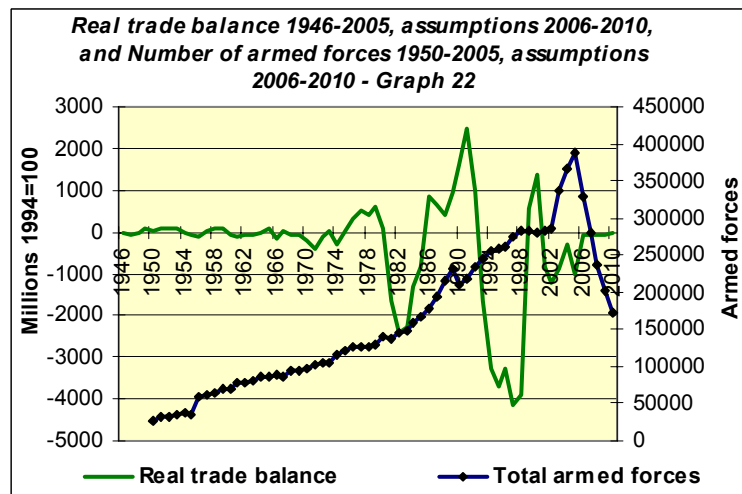




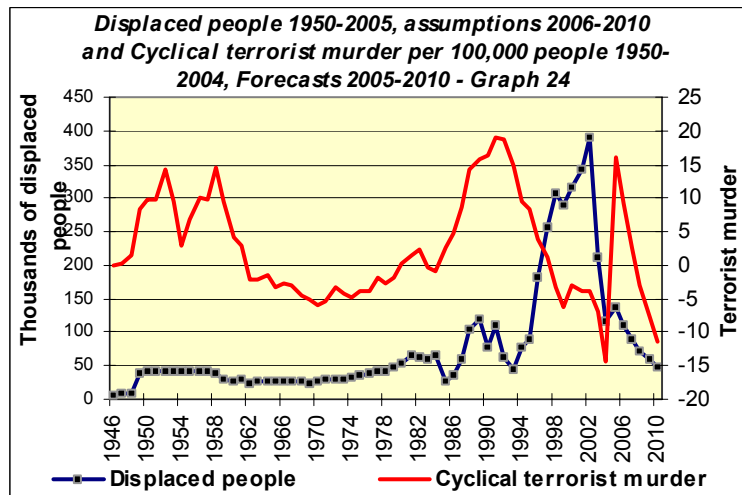
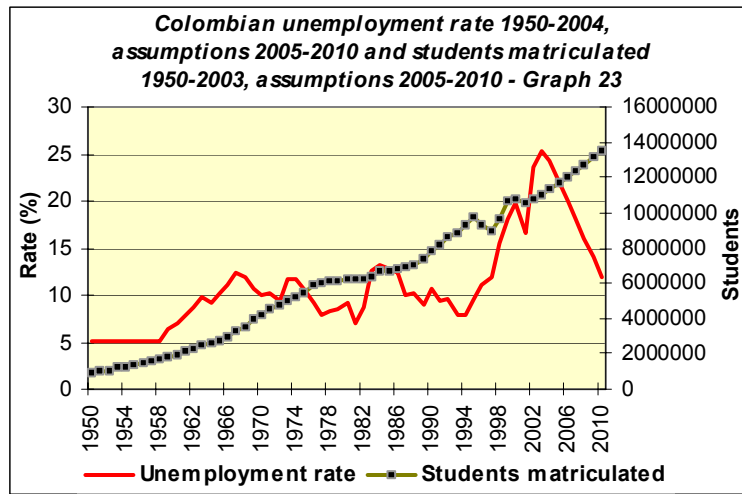
SCENARIO 8 – Accelerating disarmament – army troops decreasing 15% annually⁶.
Assumptions

The only change in this scenario with respect to the last one is army troops. Armed forces start decreasing at 15% per year from 2006 up to 2010. The number of students matriculated in all modalities continues growing annually at 3% from 2004 forth. The real trade balance displays the same small negative results experienced during the 60’s; the total armed forces decrease annually at 15%; the number of displaced people follows the trend estimated by the National Planning Department (DNP); the unemployment rate continues its declining tendency by, in this case diminishing 2% annually from 2004 forth; the number of students matriculated increases at 3% annually from 2004 forth.

As conclusion, compared to the last scenario, this one appears more appealing and probably just requires extra gauging in order to find the right value for armed forces placing terrorist murder in zero. Currently its value gets –11 murders per capita by 2010.



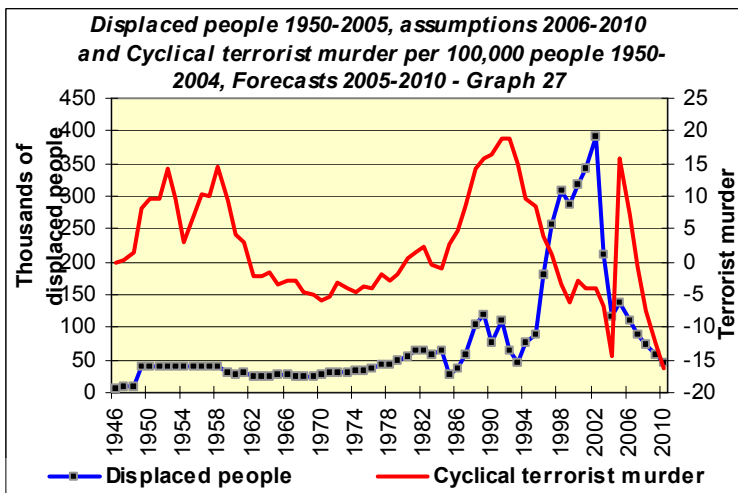
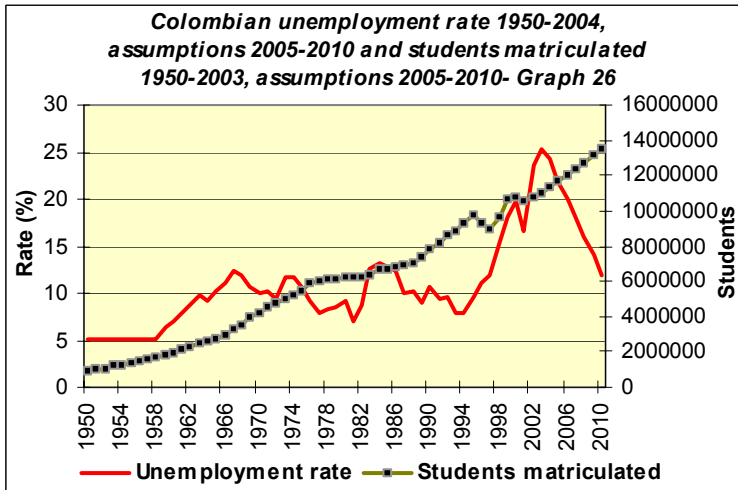
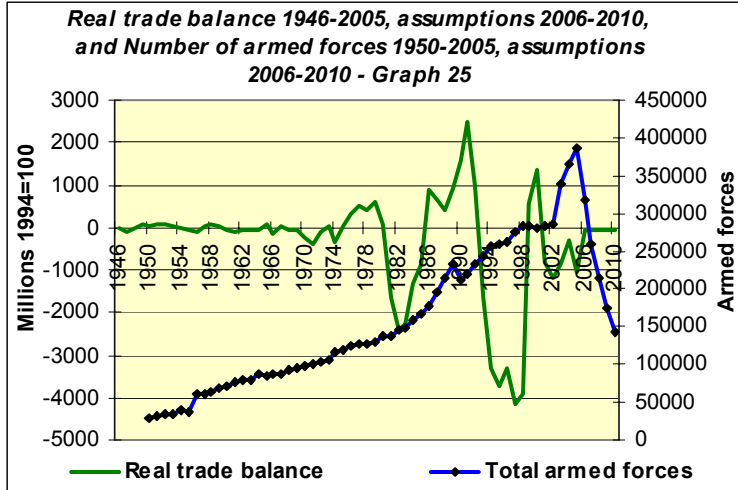
⁶ This scenario would grant a reduction in terrorist murder to 3 cases per 100,000 people by year 2007.



SCENARIO 9 – Further actions at accelerating disarmament: 18% annually⁷. Assumptions

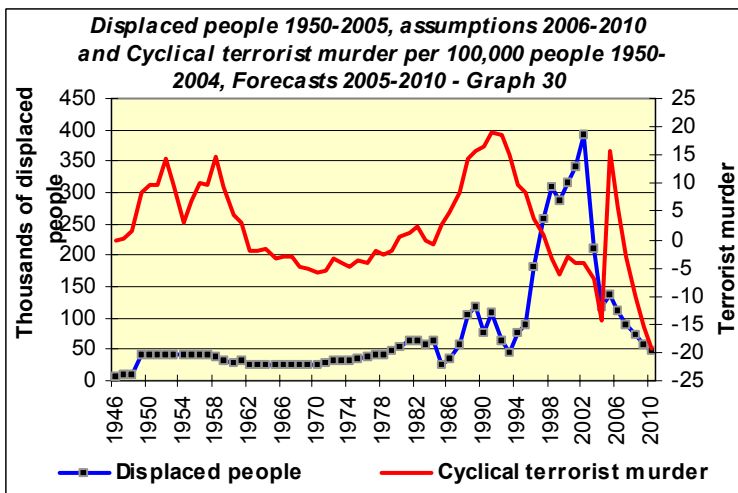
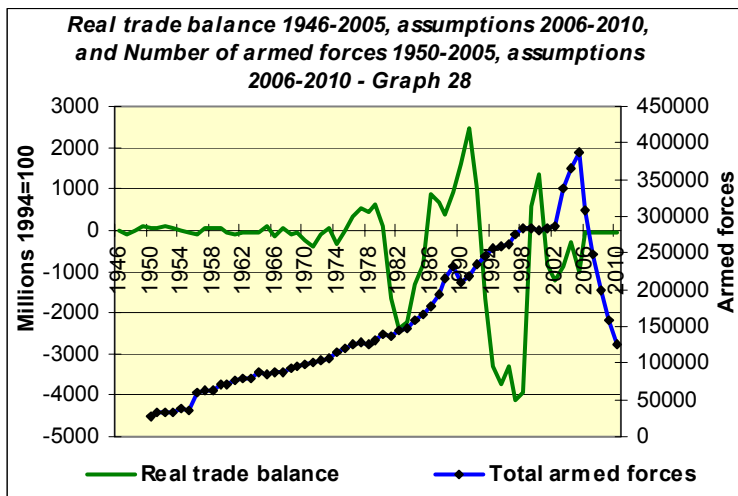
In this section, armed forces start decreasing continually at 18% per year. The number of students matriculated in all modalities continues growing annually at 3% from 2004 forth. The real trade balance displays the same small negative results experienced during the 60’s; the number of displaced people follows the trend estimated by the National Planning Department (DNP); the unemployment rate continues its declining tendency diminishing 2% annually from 2004 forth; the number of students matriculated increases at 3% annually from 2004 forth. As conclusion the augmented disarmament reduces terrorist murder by –16 per capita by 2010.

⁷ This scenario reduces terrorist murder to –7 cases per 100,000 people.



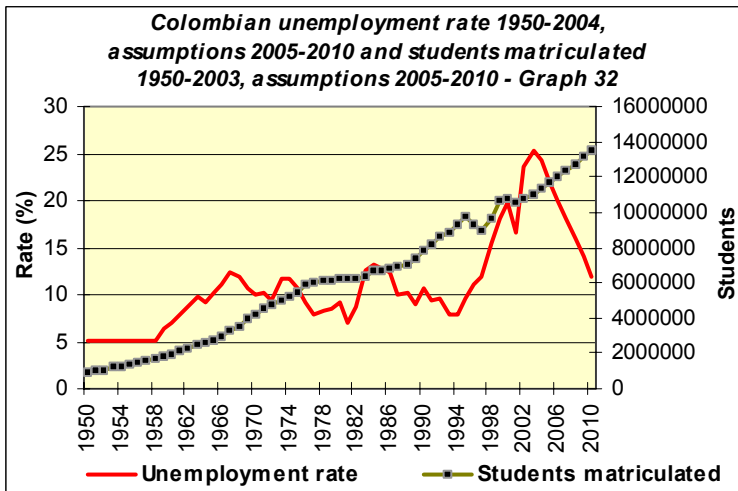
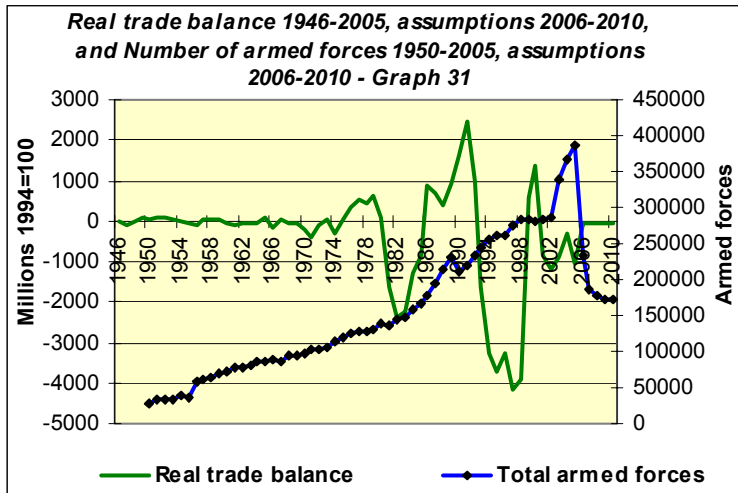
SCENARIO 10 - Modeling strong disarmament of 20% annually. Assumptions

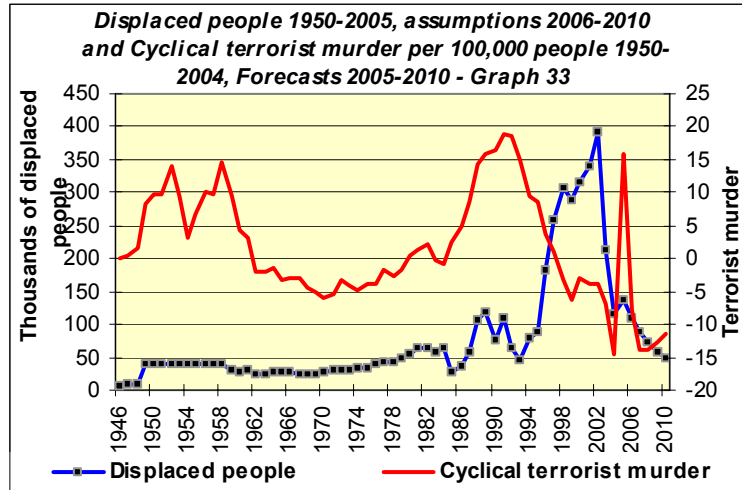
Armed forces start decreasing at 20% per year this time. The number of students matriculated in all modalities continues growing annually at 3% from 2004 forth. The real trade balance displays the same small negative results experienced during the 60's; the number of displaced people follows the trend estimated by the National Planning Department (DNP); the unemployment rate continues its declining tendency by, in this case diminishing 2% annually from 2004 forth; the number of students matriculated increases at 3% annually from 2004 forth. As conclusion, terrorist murder diminishes by -19 murders per capita by 2010.



SCENARIO 11 – Armed forces decreasing in a gradient way. Assumptions

Armed forces start decreasing according to a gradient: 40% 2006, 20% 2007, 5% 2008, 2% 2009, 1% 2010. The number of students matriculated in all modalities continues growing annually at 3% from 2004 forth. The real trade balance displays the same small negative results experienced during the 60's; the number of displaced people follows the trend estimated by the National Planning Department (DNP); the unemployment rate continues its declining tendency diminishing at 2% annually from 2004 forth; the number of students matriculated increases at 3% annually from 2004 forth.





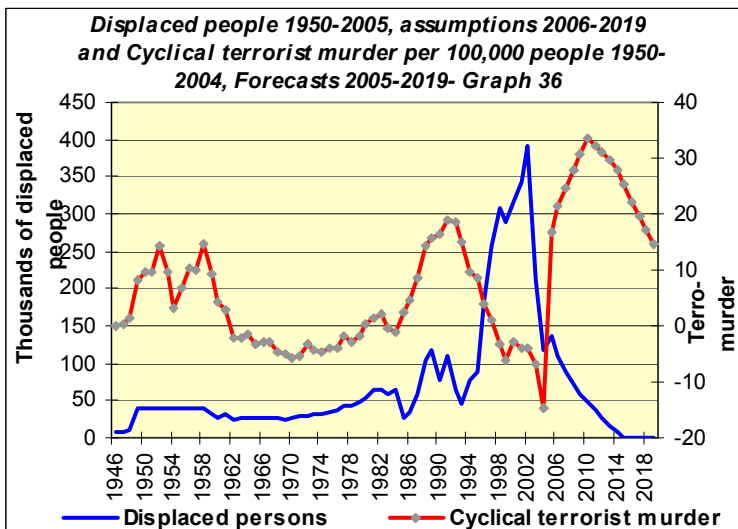
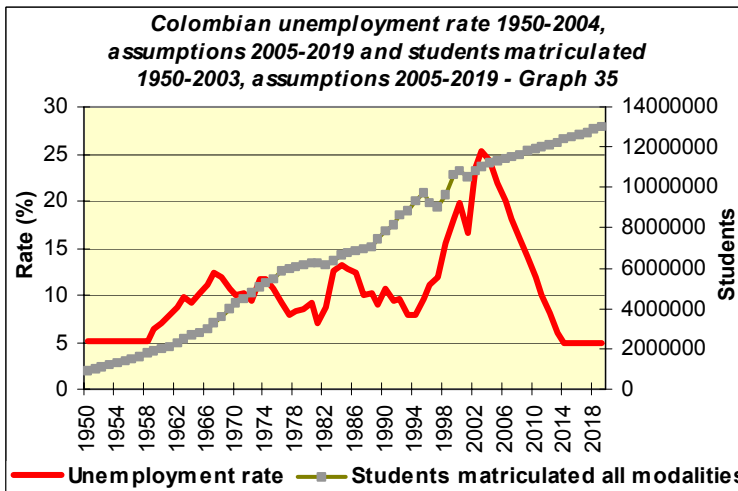
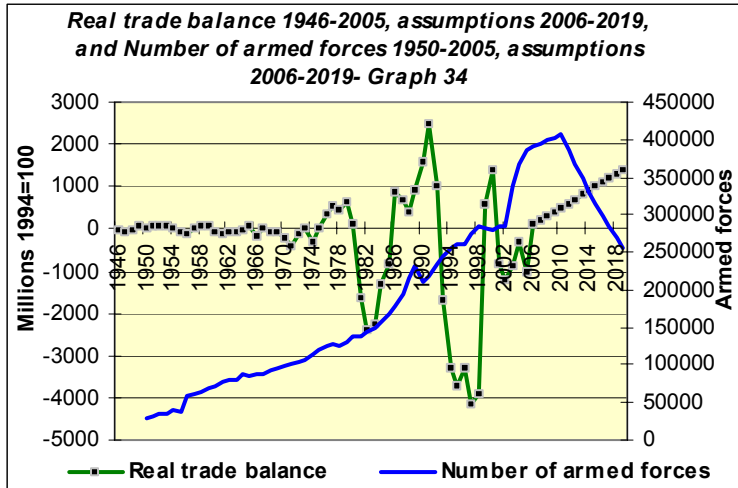
***A MODEL OF CYCLICAL TERRORIST MURDER IN COLOMBIA, 1950 –2004.
SCENARIOS GRANTING SUSTAINABLE PEACE BY YEAR 2019***

Introduction.

This section presents 18 additional scenarios, some of them granting sustainable peace before year 2019.

SCENARIO 1 – Assumptions

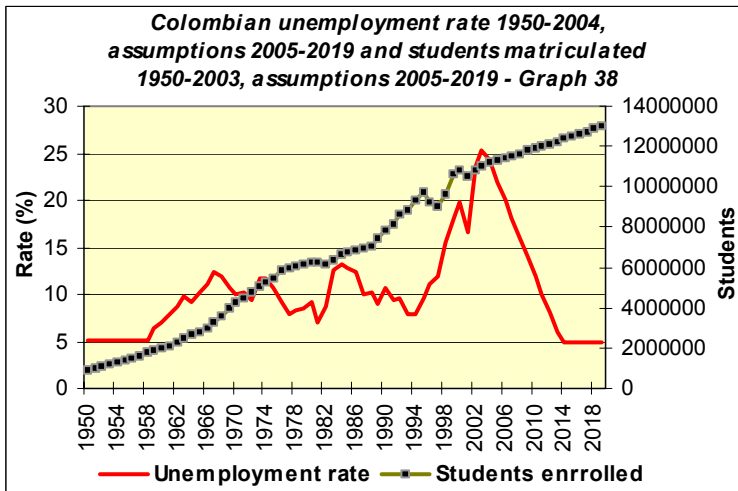
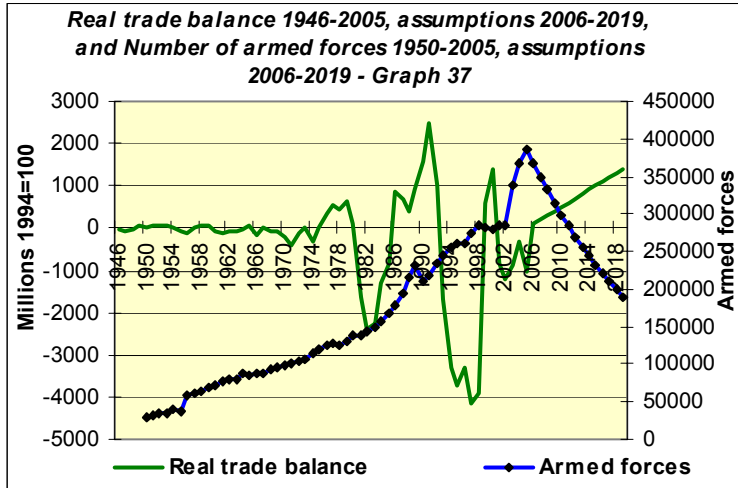
The real trade balance becomes positive in year 2006, and increases by 100 millions up to year 2019; total armed forces grows at 1% from 2005 to 2010, in year 2011 starts decreasing annually at 5%; the unemployment rate decreases annually at 2% from 2006 to 2013, from 2014 forth stabilizes around 5%; students enrolled in all modalities increases at annually at 1% after 2003 up to 2019; displaced people follows the trend estimated by the National Planning Department up to 2010, from 2011 to 2014 they diminish annually by 10,000 people and becomes zero from 2015 to 2019 (table 1, and graphs 34 to 36).

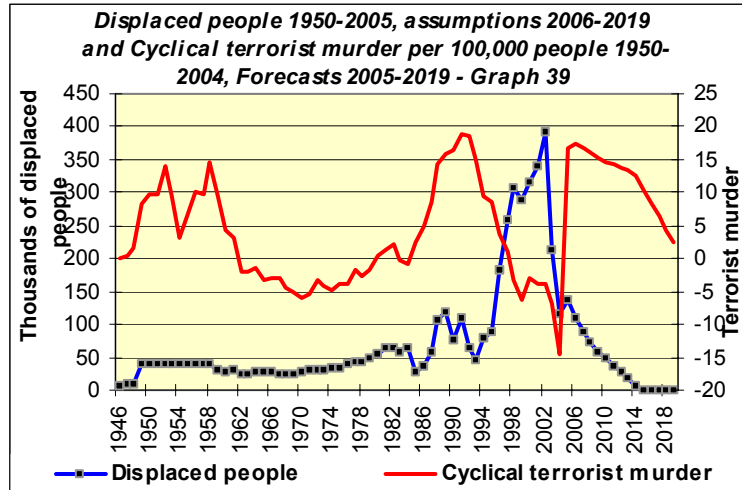


SCENARIO 2 – Assumptions – Moderate disarmament, Army troops diminishing at 5%

The only change in this scenario compared to the last one, is army troops diminishing at 5% annually from 2006 to 2019.

Real trade balance increases by 100 millions annually from 2006 to 2019; students enrolled grows at 1% annually from 2006 to 2019; displaced people follows the forecasts by DNP; the unemployment rate diminish annually at 2% after 2004. As conclusion this scenario grants peace by 2019 (terrorist murder at 3 cases per 100,000 people)

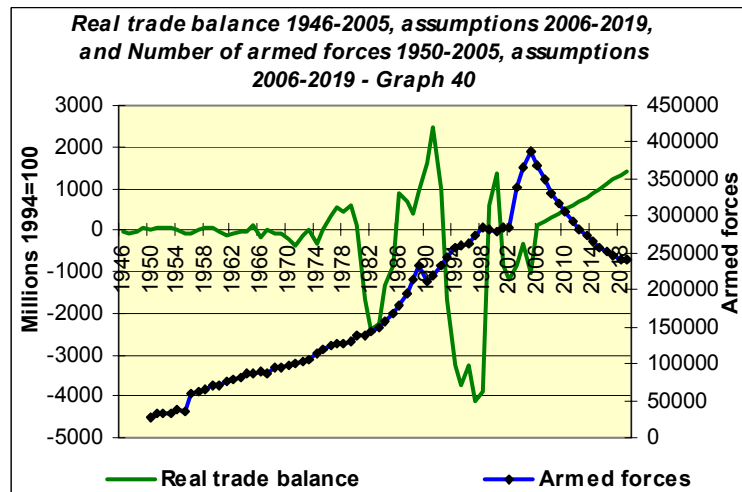


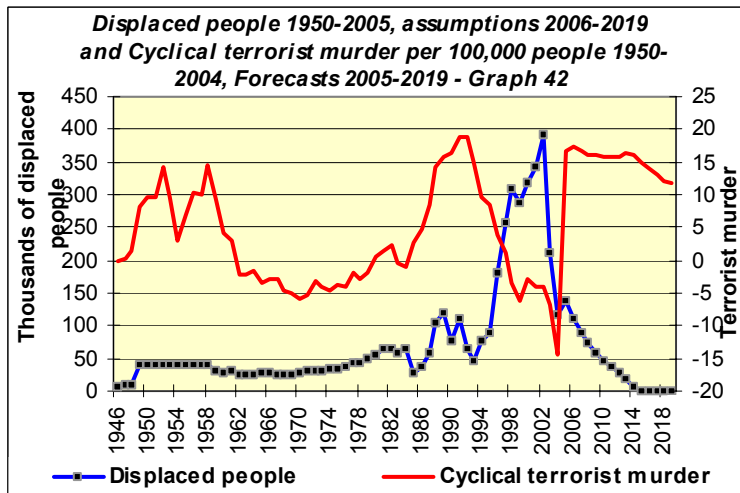
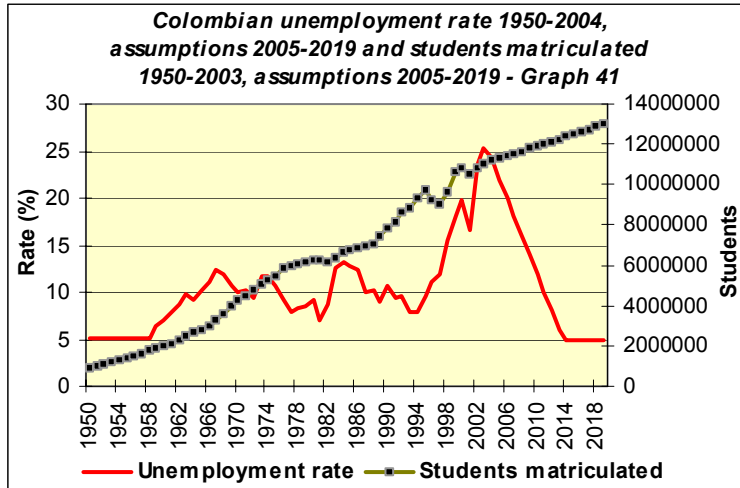


SCENARIO 3 – Assumptions. Army troops diminishing.

Army troops diminishing at 5% annually from 2006 to 2008; 4% from 2009 to 2012; 3% from 2013 to 2015 and 2% from 2016 to 2018.

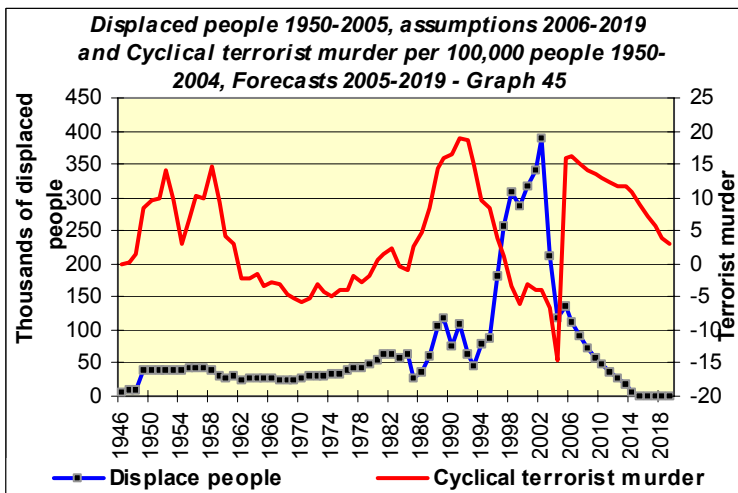
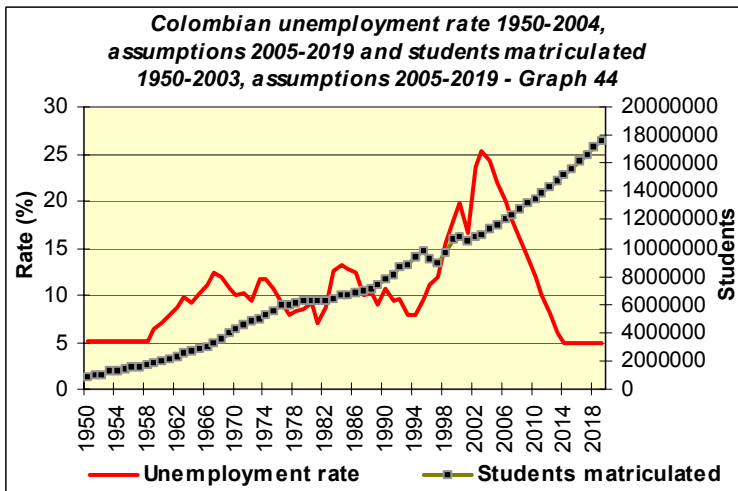
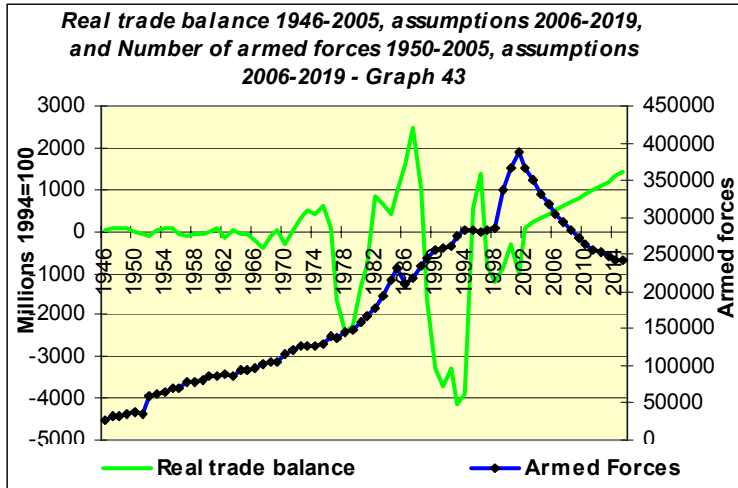
Real trade balance increases annually by 100 millions up to year 2019; students enrolled grows at 1% annually; displacement follows the forecasts estimated by DNP; and the unemployment rates falling annually by 2 percent points. This scenario does not destroy completely cyclical murder, and so scenario #2 proves better when compared with this one.





SCENARIO 4 – Social content introduced: students enrolled in all modalities increases annually at 3%, while army forces diminish according to changes in last scenario. Assumptions.

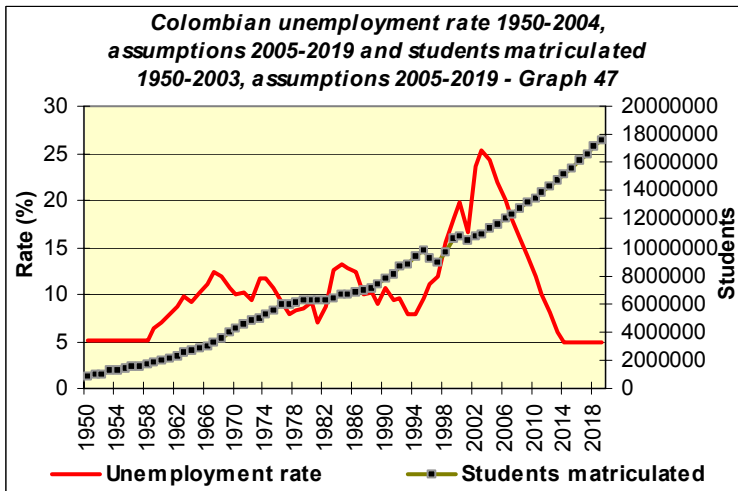
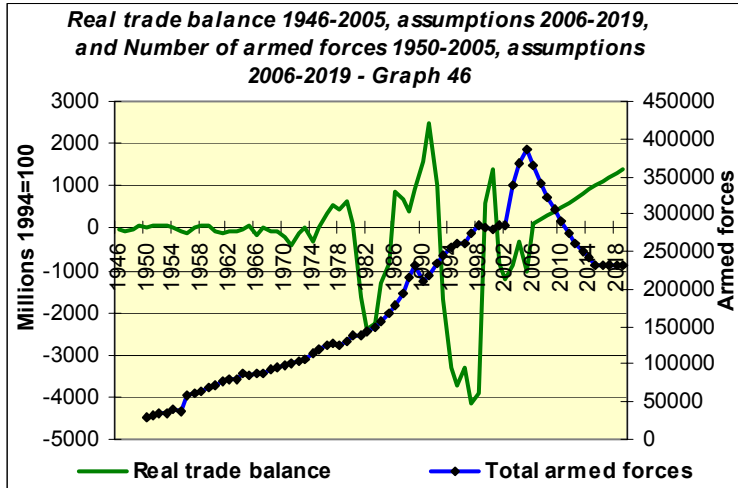
Armed forces diminish at 5%(2006-2008); 4%(2009-2012); 3%(2013-2015); 2%(2016-2018). Students matriculated increases annually at 3% annually from 2004 forth. The other variables remain the same compared to last scenario. Real trade balance increases annually 100 millions; displacement follows assumptions by DNP; and the unemployment rate falling at 2% annually. As conclusion keeping the reduction in armed forces plus increasing enrollment grants peace by 2019.

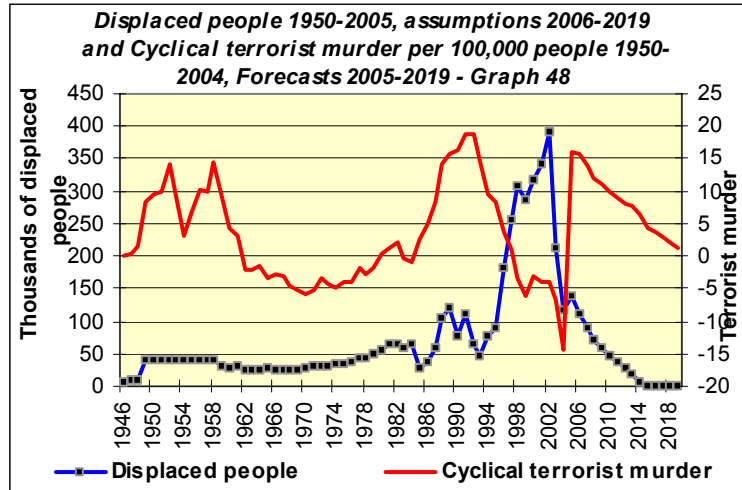


SCENARIO 5 – Pursuing further reduction in army troops. Assumptions

Army troops diminishing annually at 6% from 2006 to 2008; at 5% from 2009 to 2012; at 4% from 2013 to 2015, from 2006 forth remains constant at the figures form 2015.

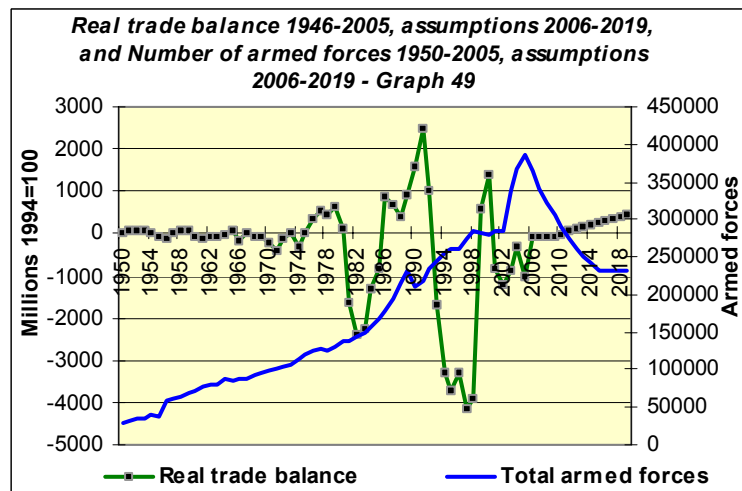
Real trade balance increases by 100 millions annually; students enrolled grows at 3% annually, displacement of people follows the forecasts estimated by DNP; the unemployment rate falls annually 2%. As conclusion a further disarmament grants peace, grants results faster (by 2019 cyclical murder is almost cero).

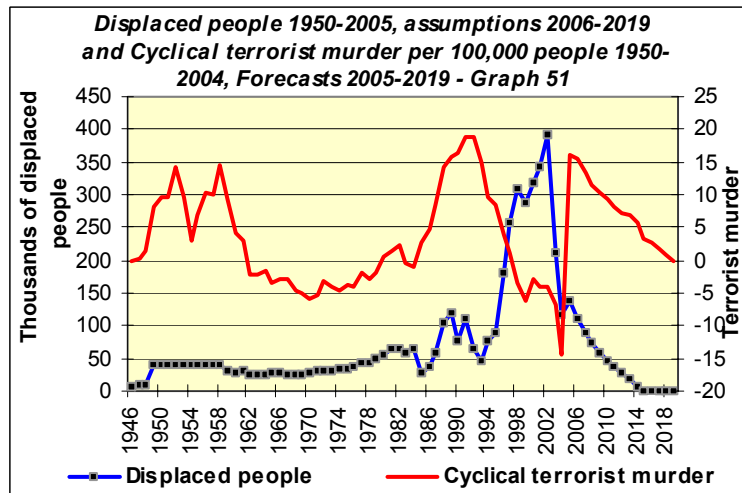
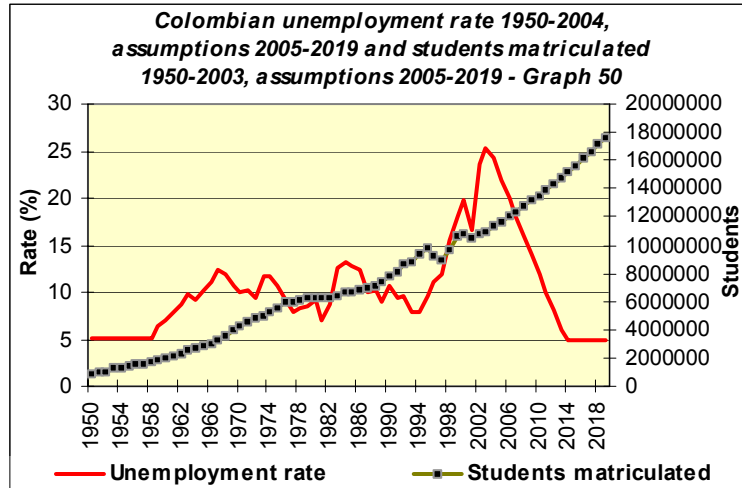




SCENARIO 6 – Modeling the impact of a negative real trade balance. Assumptions.

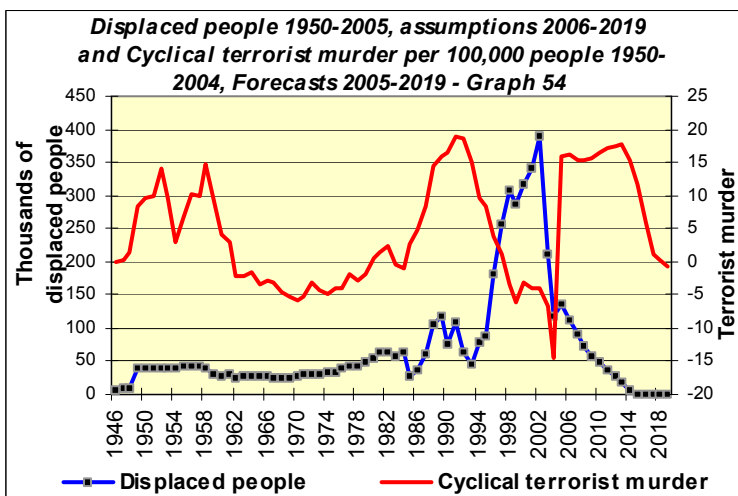
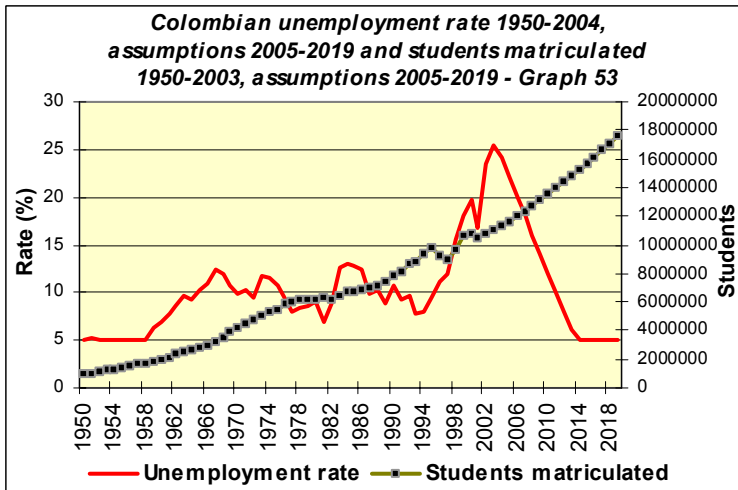
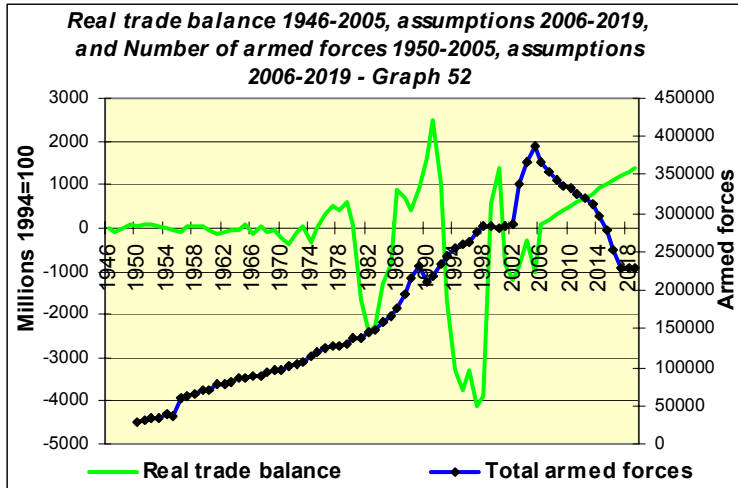
The only change in this scenario is real trade balance. I assume the real trade balance is identical to what Colombia experienced during the “*National Front Years*”, basically from 1960 to 1964; so starting in 2006, I model the impact of an oscillatory negative real trade balance. For 2006 (-54 millions-figures of 1960), 2007(-64 millions-figure of 1961), 2008(-70 millions - figures of 1962), 2009(-59 millions-figures of 1963), 2010 (-38 millions-figures of 1964). Later in 2010 becomes positive at 50 millions and start increasing that quantity annually up to 2019. Armed forces diminish annually at 6%(2006-2008), 5%(2009-2012),4%(2013-2015); students enrolled grows at 3% annually, displaced people follows the pattern estimated by DNP and, the unemployment rates diminish at 2% annually. This scenario destroys murder, but it is not acceptable for the assumption of a negative trade balance.





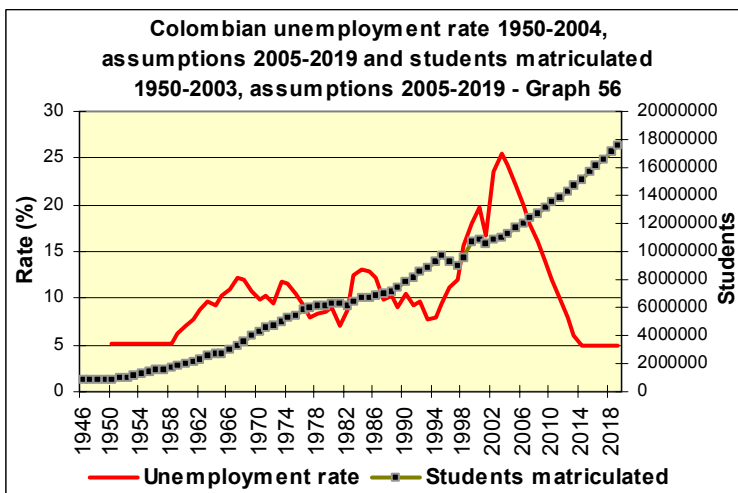
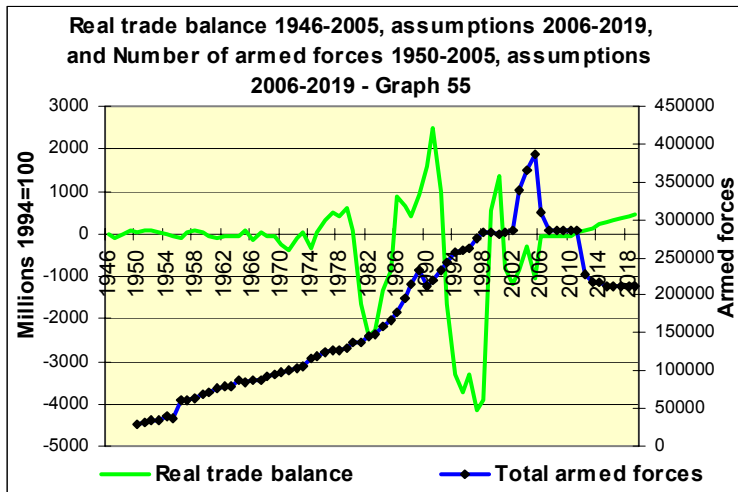
SCENARIO 7 – Moderate disarmament continued up to 2019. Assumptions

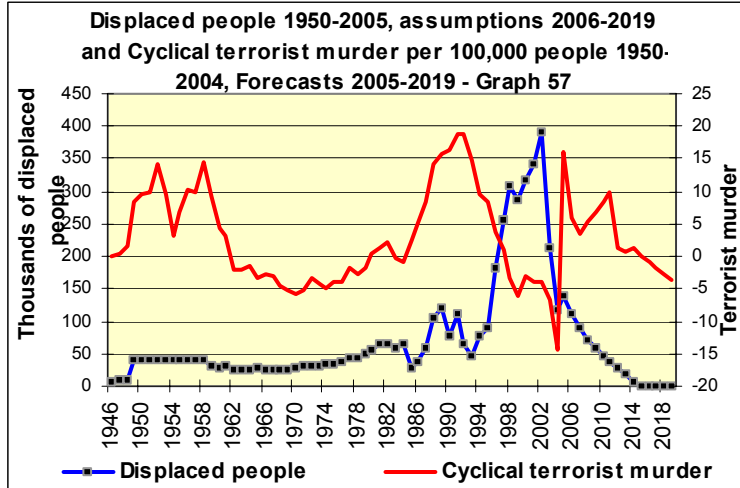
Armed forces diminish 5% in 2006; 4% 2007, 3% 2008, 2% 2009, 1% 2010. 2% in 2011, 2% 2012, 2% 2013, 5% 2014, 6% 2015, 10% 2016, 9% 2017, from 2018 to 2019 I keep the forces from 2017. The real trade balance remains at the same figures of the National Front years; students enrolled growing at 3% annually; displacement follows the assumptions by DNP; unemployment rate falling at 2% annually. As conclusion this scenario not just destroys terrorist murder, but makes it negative.



SCENARIO 8 – Beginning strong disarmament – army troops decreasing 20% the first year. Assumptions

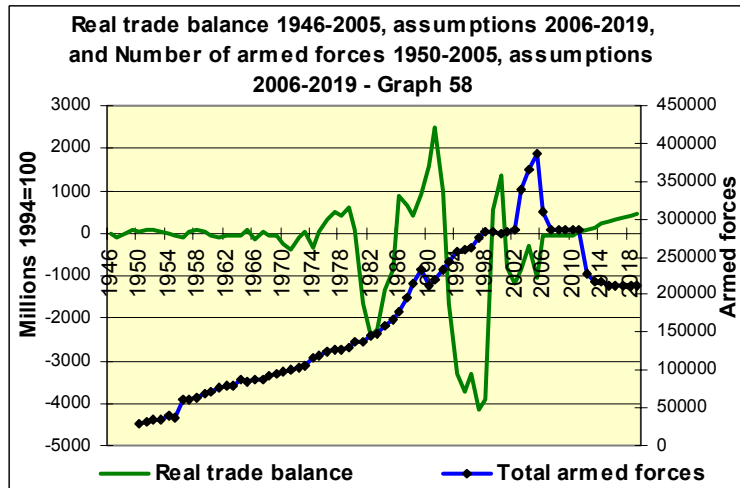
Armed forces diminish in this scenario variably: 20% on 2006 , 8% on 2007; then remain constant from 2008 to 2011. On 2012 they diminish 20%, and 5% on 2013, on 2014 they remain constant; on 2015 they reduce again by 2% and, from 2016 to 2019 they remain constant. . The real trade balance remains at the same figures of the National Front years; students enrolled growing at 3% annually; displacement follows the assumptions by DNP; unemployment rate falling at 2% annually. As conclusion further reduction in disarmament reduces terrorist murder accordingly.

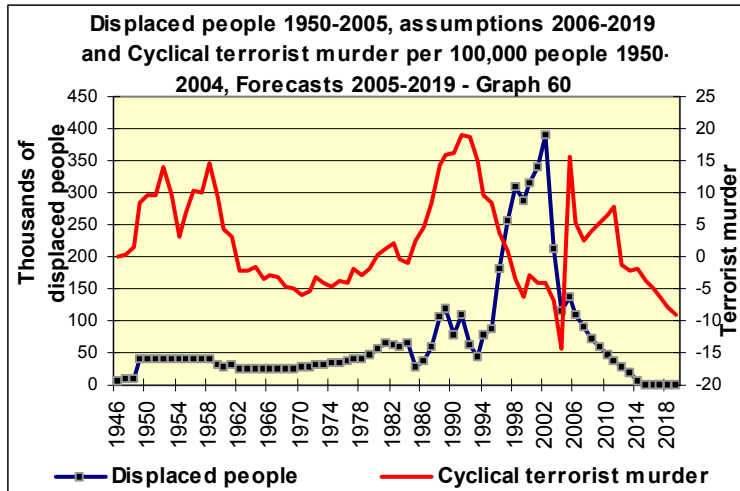
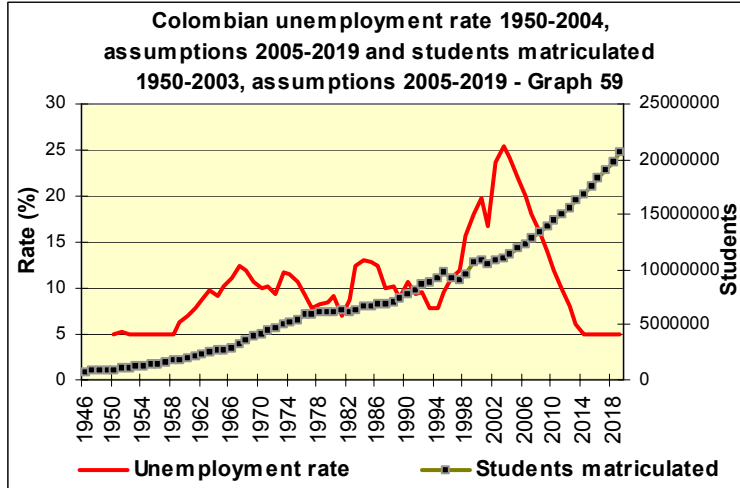




SCENARIO 9 – Increasing the social content. Students enrolled growing at 4% annually. Assumptions

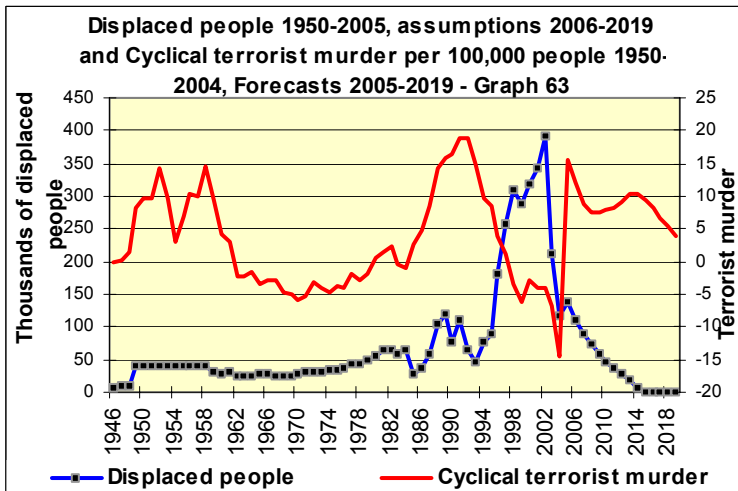
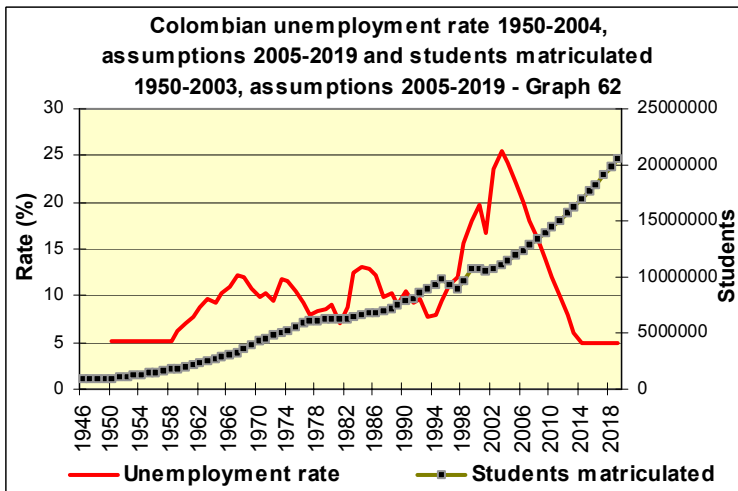
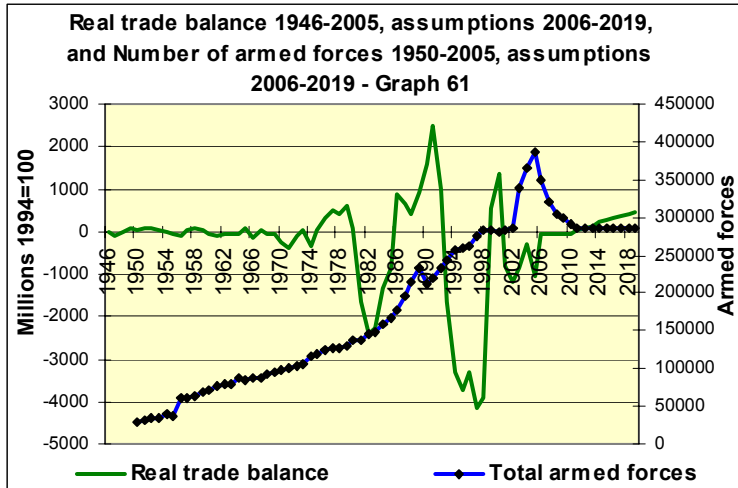
Armed forces diminish in this scenario variably: 20% on 2006 , 8% on 2007; then remain constant from 2008 to 2011. On 2012 they diminish 20%, and 5% on 2013, on 2014 they remain constant; on 2015 they reduce again by 2% and, from 2016 to 2019 they remain constant. . The real trade balance remains at the same figures of the National Front years; students enrolled growing at 4% annually; displacement follows the assumptions by DNP; unemployment rate falling at 2% annually. As conclusion further reduction in disarmament reduces murder plus the increase in enrollment destroys terrorist murder, according to this scenario it appears that if we do not want to sacrifice troops have to pursue further increases in enrollment.





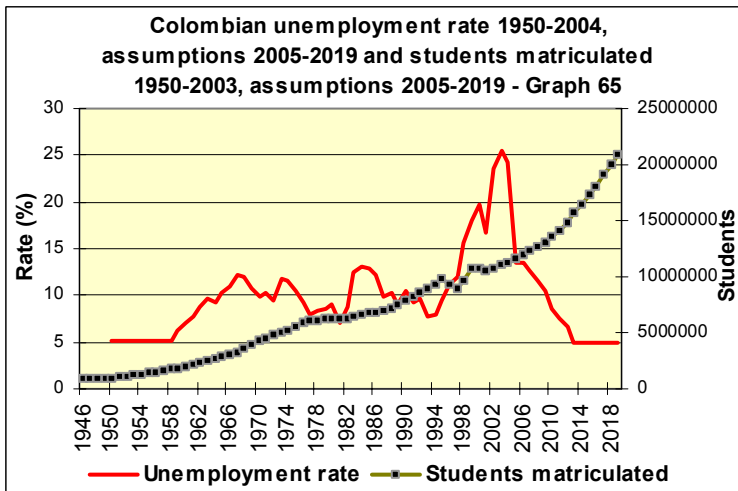
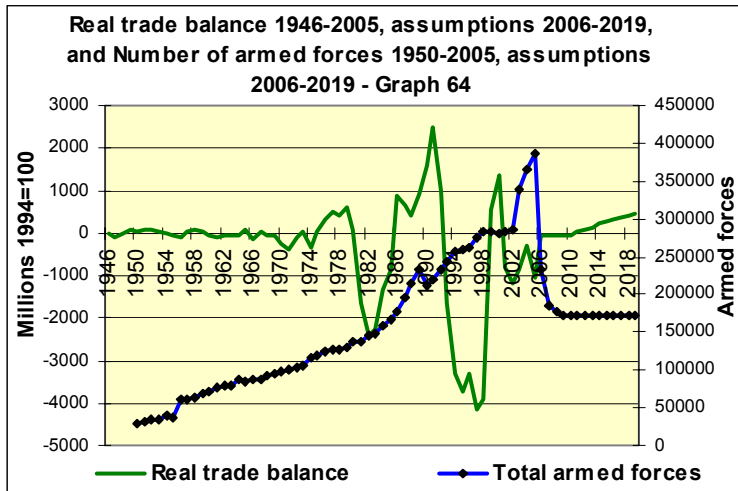
SCENARIO 10 – Modeling moderate disarmament, 10% on 2006. Assumptions

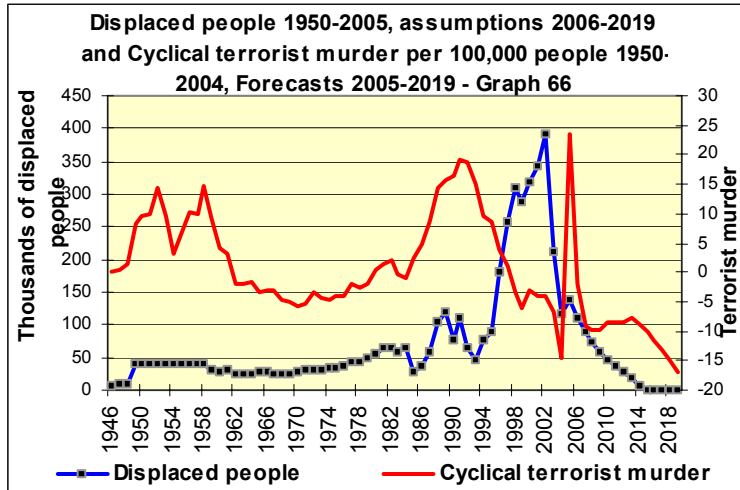
Armed forces decrease by 10% on 2006, 8% on 2007, 5% on 2008, 2% continuous from 2009 to 2011, from 2012 forth it remains constant. The real trade balance remains at the same figures of the National Front years but from 2011 to 2019 increase annually in 50 millions; students enrolled growing at 4% annually; displacement follows the assumptions by DNP; unemployment rate falling at 2% annually. As conclusion, this scenario appears displaying no sacrifice in trade balance neither armed forces, enrollment grows, displacement is eradicated and terrorist murder remains at 4 per capita which is acceptable.



SCENARIO 11 – Increasing the social content, students growing at 5% annually, and strong disarmament of 40% on 2006. Assumptions.

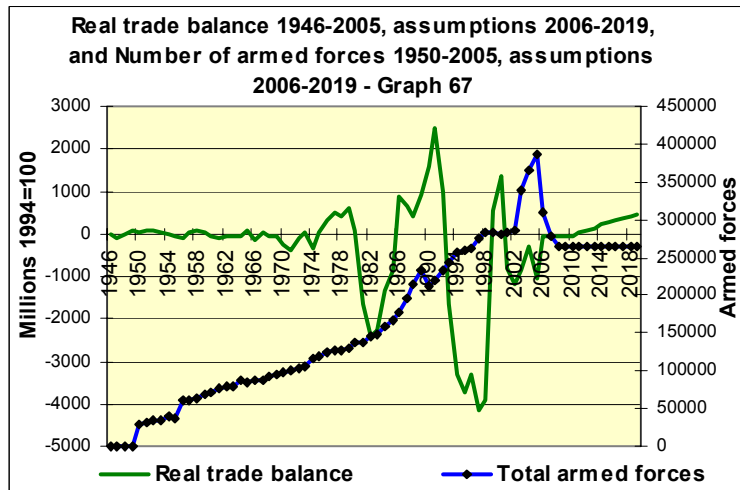
In this scenario, students enrolled are growing at 3% from 2004 to 2010, and at 5% from 2011 to 2019. The armed forces are disarmed at 40% on 2005, 20% on 2006, 5% on 2007, 2% on 2008, 1% on 2009, from 2010 to 2019 remain constant. The real trade balance oscillates around negative figures form 2006 to 2010 and becomes positive from 2011 to 2019; displacement follows the assumptions by DNP. As conclusion the policy mixture is too strong since terrorist murder becomes excessively negative (-17 per capita).

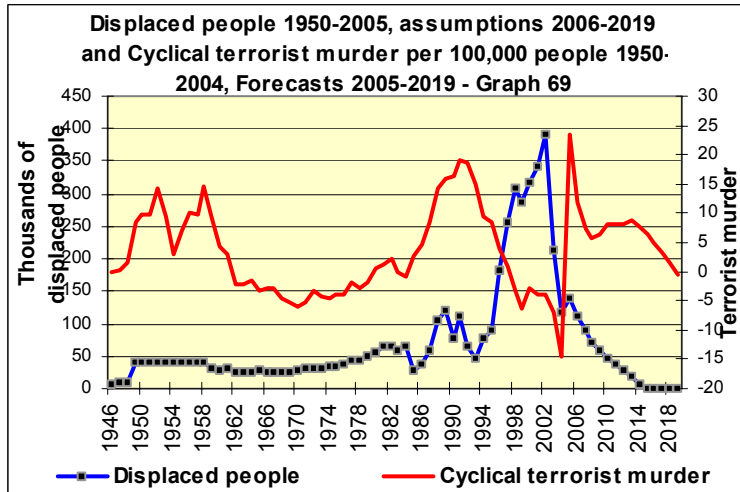
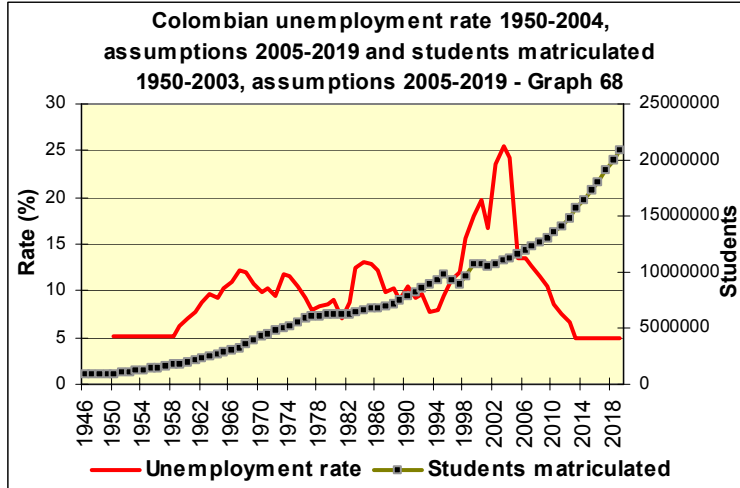




SCENARIO 12. Disarmament. Assumptions.

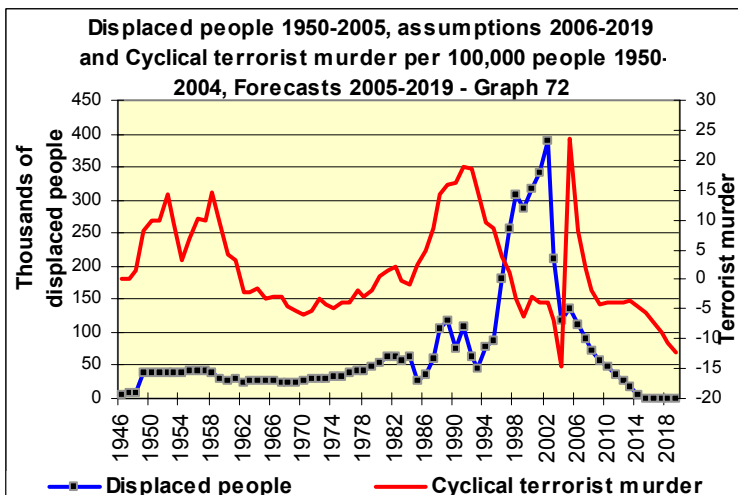
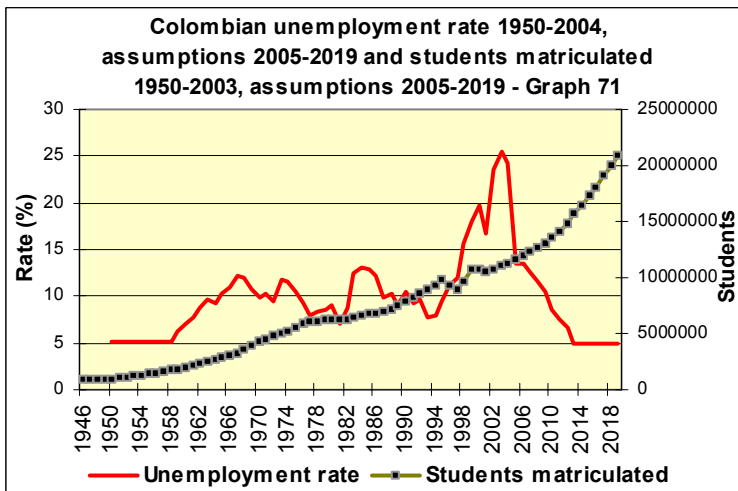
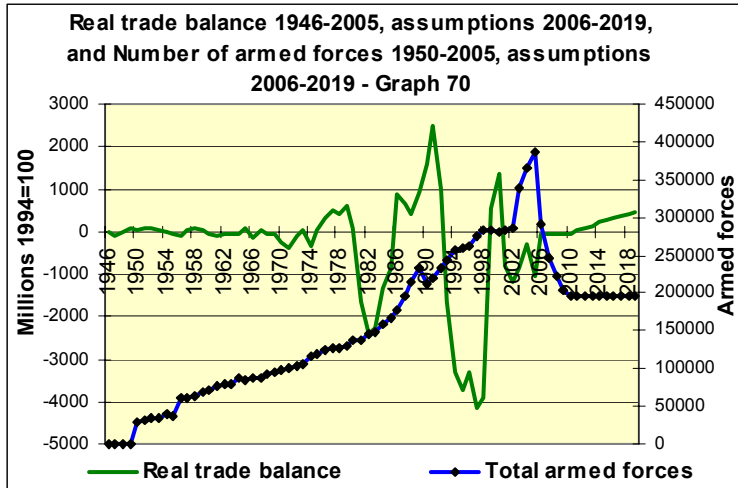
Armed forces diminish 20% on 2006, 10% on 2007 and 5% on 2008; from 2009 to 2019 they remain constant. Students growing at 3% from 2004 to 2010, and at 5% from 2011 to 2019; the real trade balance oscillates around negative figures form 2006 to 2010 and becomes positive from 2011 to 2019; displacement follows the assumptions by DNP. As conclusion this scenario grants peace by year 2019.





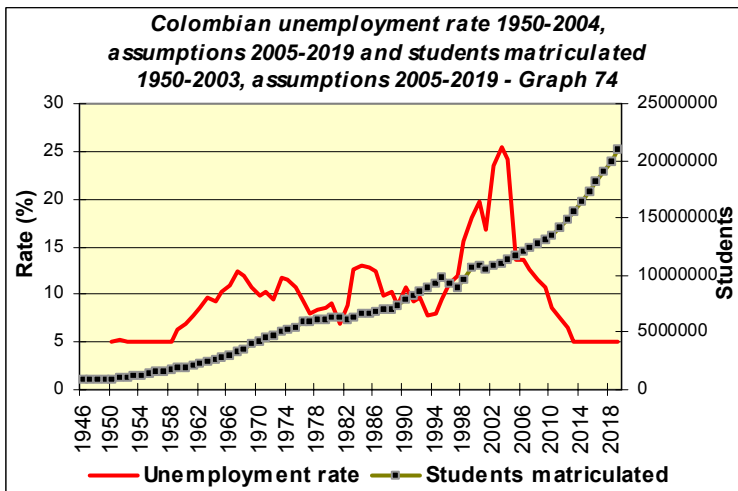
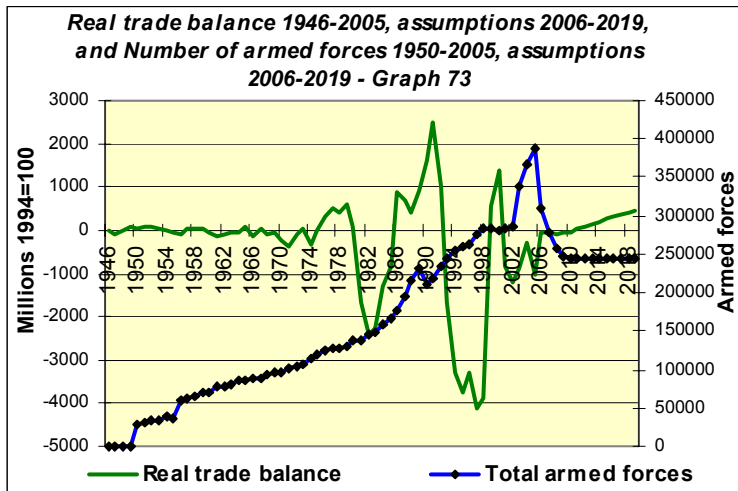
SCENARIO 13 – More than moderate disarmament again, armed forces diminish 25% the first year. Assumptions.

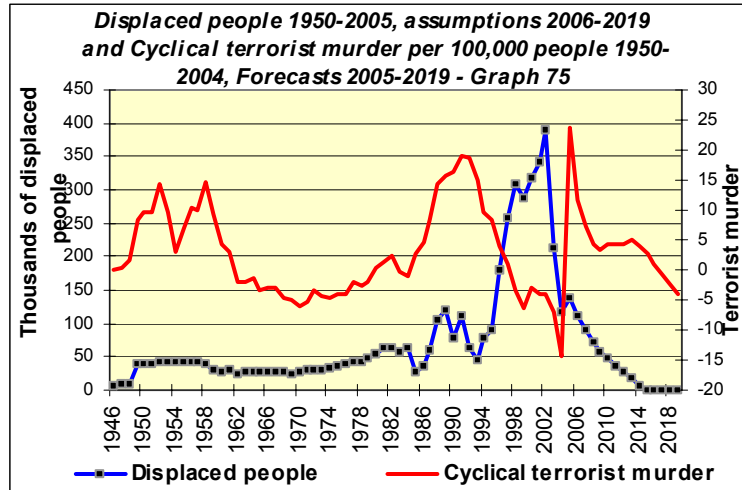
Armed forces diminish 25% on 2006, 15% on 2007, 10% on 2008, 8% on 2009, 4% on 2010, and remains constant from 2011 to 2019. Students growing at 3% from 2004 to 2010, and at 5% from 2011 to 2019; the real trade balance oscillates around negative figures from 2006 to 2010 and becomes positive from 2011 to 2019; displacement follows the assumptions by DNP. As conclusion this scenario grants peace by year 2019; it appears to be a good choice since it grants peace by year 2008 (with terrorist murder at -2 per capita).



SCENARIO 14. Disarmament. Assumptions.

Armed forces diminish by 20% on 2006, 10% on 2007, 8% on 2008, 4% on 2009 and 1% on 2010, from 2011 to 2019 they remain constant. Students growing at 3% from 2004 to 2010, and at 5% from 2011 to 2019; the real trade balance oscillates around negative figures form 2006 to 2010 and becomes positive from 2011 to 2019; displacement follows the assumptions by DNP. This scenario grants peace by year 2015 (3 terrorist murder per capita).

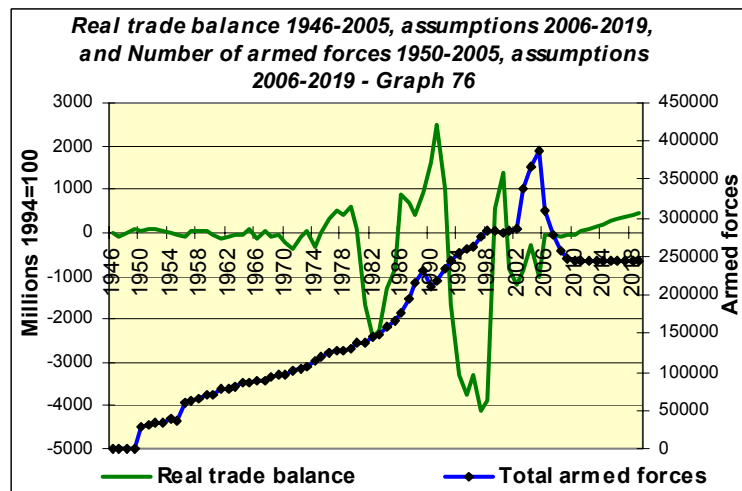


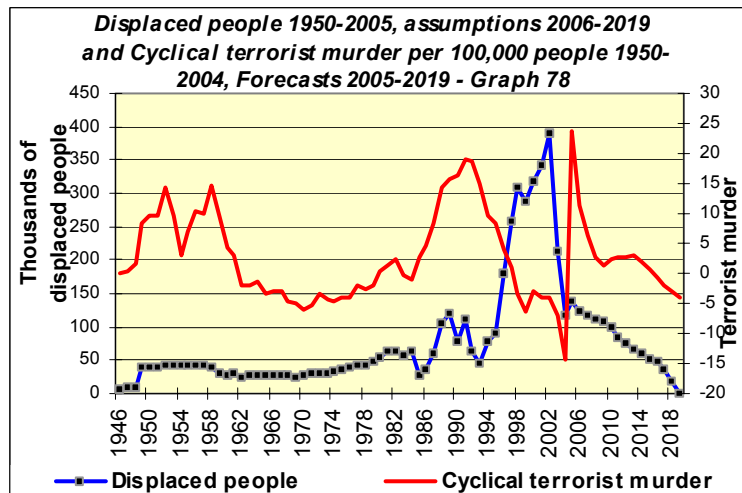
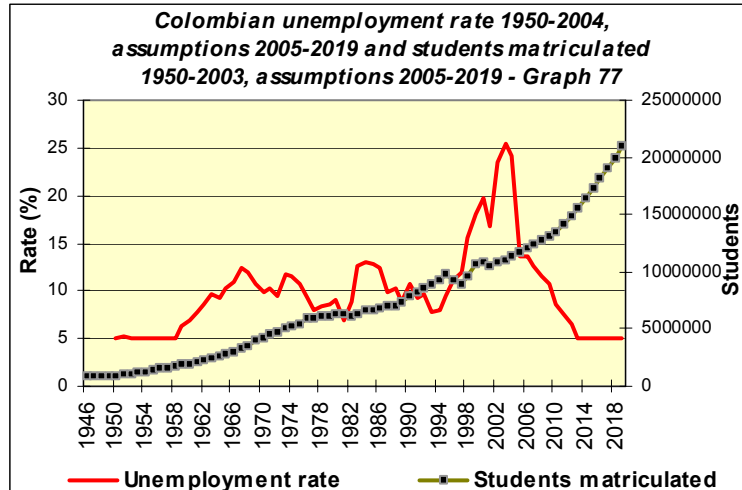


SCENARIO 15. Pessimistic scenario. The existence of displaced people by year 2018

For didactic purposes I model a slow reduction of displaced people, and its existence up to year 2018. According to this, displaced people diminish 10% on 2006, 6% on 2007, 4% on 2008, 3% on 2009, 10% on 2010, 15% on 2011, 10% on 2012, 10% on 2013, 10% on 2014, 15% on 2015, 10% on 2016, 50% on 2018.

Armed forces also diminish by 20% on 2006, 10% on 2007, 8% on 2008, 4% on 2009, and 1% on 2010. Students growing at 3% from 2004 to 2010, and at 5% from 2011 to 2019; the real trade balance oscillates around negative figures from 2006 to 2010 and becomes positive from 2011 to 2019. This scenario grants peace by year 2008 (judging as acceptable 3 cyclical murders per capita).

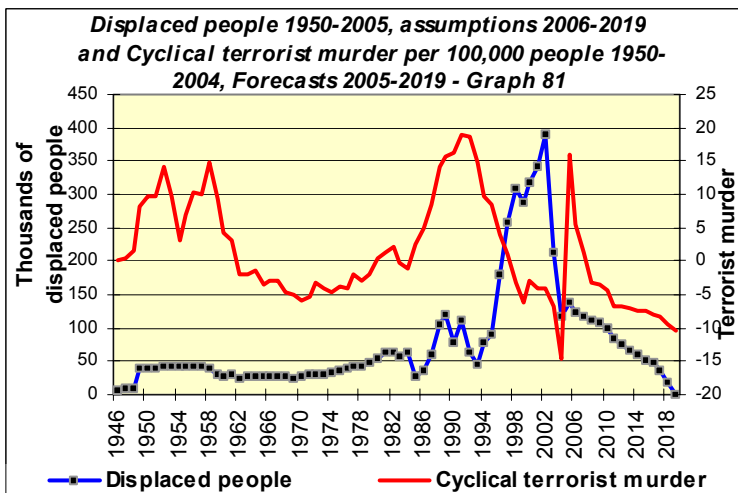
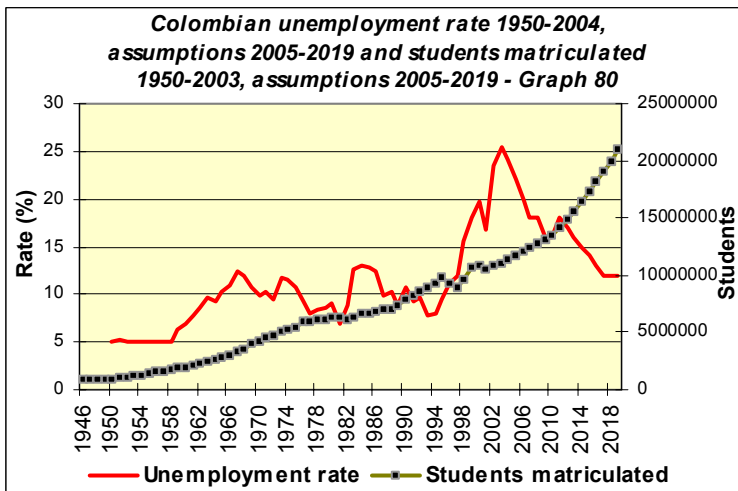
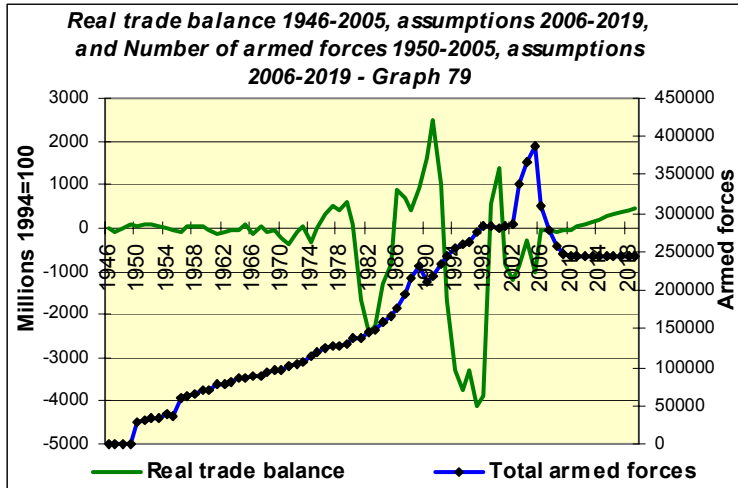




SCENARIO 16. Pessimistic scenario. High unemployment rate, displacement continues, armed forces increases

I model the assumption of a high unemployment rate up to year 2019. Displaced people diminish 10% on 2006, 6% on 2007, 4% on 2008, 3% on 2009, 10% on 2010, 15% on 2011, 10% on 2012, 10% on 2013, 10% on 2014, 15% on 2015, 10% on 2016, 50% on 2018.

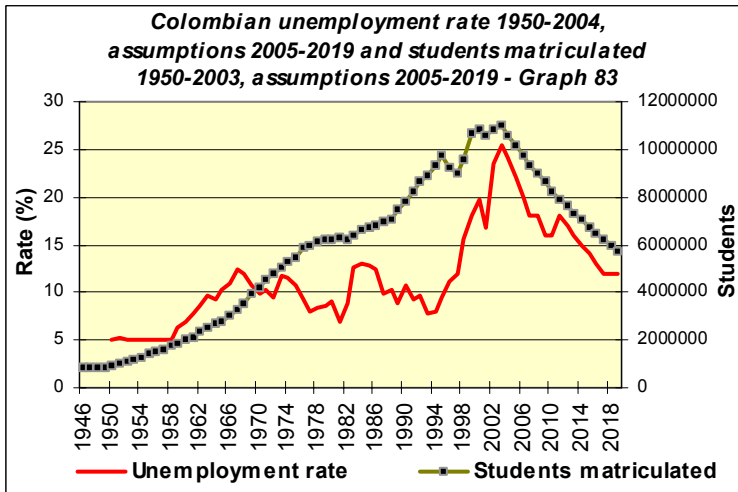
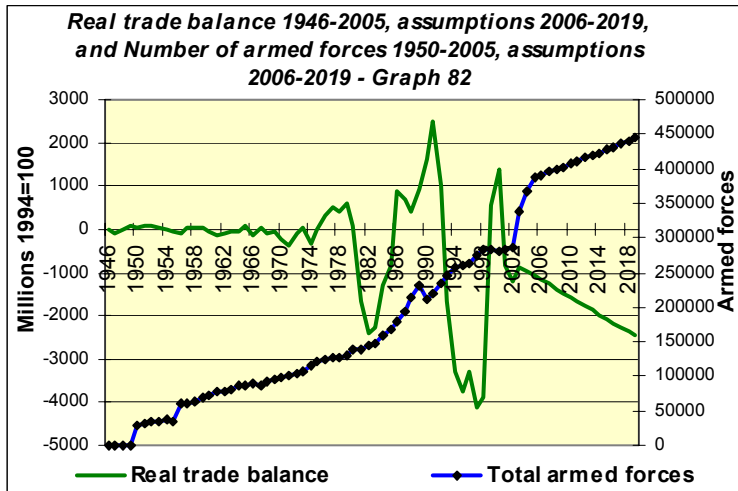
Armed forces also diminish by 20% on 2006, 10% on 2007, 8% on 2008, 4% on 2009, and 1% on 2010. Students growing at 3% from 2004 to 2010, and at 5% from 2011 to 2019; the real trade balance oscillates around negative figures from 2006 to 2010 and becomes positive from 2011 to 2019. The scenario appears to be granting peace by year 2007.

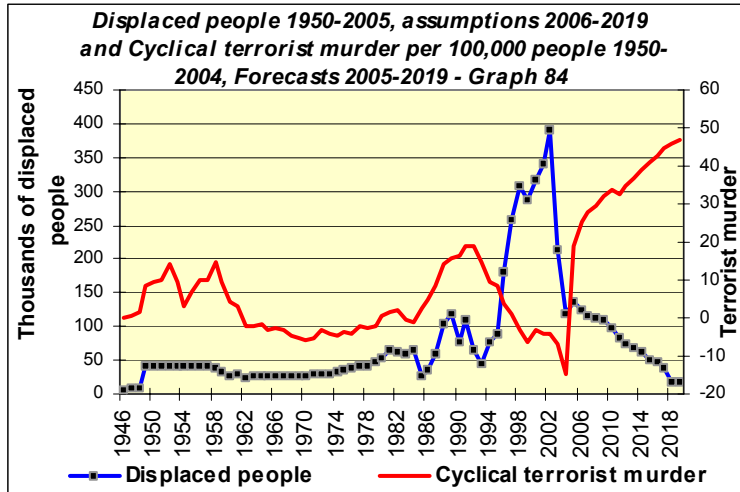


SCENARIO 17. PESSIMISTIC SCENARIO. *A situation where everything shifts for the worst.*

In this hypothetical scenario, I assume there is no alternation in power, real trade balance starts deteriorating, students enrolled diminish, armed forces and displaced people continue increasing and the country keeps the high unemployment rate from last scenario.

The Real trade balance becomes negative in 2004, and diminishes by 100 millions yearly up to 2019, total armed forces increases 1% annually from 2005 to 2019, displaced people increases 1% annually from 2006 to 2019 (approximate number of 18,000); students enrolled diminish at 4% annually from 2004 to 2019. As conclusion terrorist murder explodes instantly.





Conclusion

Terrorist murder is expected to decrease again by 2006 and 2007 and peace will be attained around year 2008 while *sustainable peace* granted before year 2019.

Acknowledgments

I thank Colonel Mario Gutiérrez Jiménez Director DIJIN for supplying *Revista de Criminalidad*. For comments on a draft paper I thank participants at the Cowles Conference on the Econometrics of Strategy and Decision Making, Yale University 2000; Peace Science Conference, Middlesex University, London 2001 and, the First International Conference on: Defense, Security and Economic Development in the Balkans and Eastern Mediterranean, Larissa, Greece, 2001. Many other professionals contributed during the last 10 years, particularly Eugenia Almand from *Margaret Ann Isely Foundation* in Denver, Dr. Jurgen Brauer, Dr. Manuel Ramírez Gómez, officers of National Planning Department, in particular Dr. Amanda Rocío Molina, Dr. Carlos Zarruk Gómez, and Dr. Eduardo González - Colombian Presidency Office of the High Commissioner for Peace as well as high ranking officers of the Ministry of Defense, both gave me important directions at a colloquiums held in Colombia in 1999. I also thank Regis University for providing computational support, during these years.

Appendix: data sources

All monetary variables were obtained in nominal terms and converted with the implicit GDP deflator (1994=100). The deflator is obtained for 1946-49 from CEPAL, for 1950-1980 from Banco de la República (Central Bank of Colombia), and for 1981-1999 from Departamento Administrativo Nacional de Estadística (DANE).

Per capita adjustments are made on the basis of total population (millions) counts coming from the censuses of 1953, 1968, 1973, 1978, 1983, 1985, 1993 and projections by DANE.

Nominal social expenses (in millions of Colombian pesos) consist of health expenditures and education expenditures. For 1946-1970, taken from “Estado y Hacienda Pública en Colombia, 1934-1990,” by César Giraldo (Contraloría General de la República); for 1971-1999, taken from financial reports of the General Comptrollers Office of Colombia.

Nominal trade balance data (millions of colombian pesos) is obtained as the difference of exports and imports of goods and services; Banco de la República (Colombian Central Bank), DANE, and calculations by the Departamento Nacional de Planeación (National Planning Department), Macroeconomics Studies Unit. Nominal private consumption (millions of Colombian pesos); Banco de la República, DANE, and calculations by the National Planning Department, Macroeconomic Studies Unit. Nominal government consumption (millions of Colombian pesos); Banco de la República, DANE, and calculations by the National Planning Department, Macroeconomic Studies Unit.

The data for the total number of personnel of the Colombian police (PF) and for the total number of members of the armed forces both come up to year 1989 from the National Planning Department, Justice and Security Unit; from 1999 and projections to 2006 come from the National Ministry of Defense.

The coding for the years of *La Violencia* and the *National Front* years are taken from Bushnell, 1993.

Total homicides are the sum of four murder series: murder (*homicidio*), aggravated murder (*homicidio agravado*), murder with cyclical intent (*homicidio con fin cíclica*), and

death associated with the exercise of official duties (*homicidio con función, razón cargo o ejercicio de sus funciones*). The data are taken from various issues of *Revista Criminalidad*; Colombian National Police. Finally, the cyclical component of total homicides is computed by and reported in Gómez-Sorzano (2005).

The unemployment rate for the period 1950-54 comes from the monthly bulletins of statistics (DANE), for the period 1955-1976 it was taken from Londoño (1990) and, since 1977 it corresponds to the unemployment rate in the four largest Colombian cities (Bogotá, Cali, Medellín and Barranquilla) the source is DANE.

The number of students enrolled in all modalities (pre-elementary, elementary, high school, university) are taken from 1946-1990 from Londoño (1990), for 1987-2002 from the Ministry of National Education and the ICFES (Colombian Institute for the Promotion of Higher Education).

The data for displaced families are taken from *Revista Criminalidad* #45, 2002 p.p. 86-92; and Justice and Security Unit National Planning Department (DNP).

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