

The Effect of Anti-Gang Measures on Wealth in Central American Countries

Changes: For the revision I broadened my data pool. I attempted to include several controls not correlated with direct effects on the policy. I also observed several additional statistics looking for effects on international perception (FDI and tourism) as well as education and employment stats. I then added a comparison to Guatemala which I found to be the best single country control for El Salvador. The meaning of the lambda statistic was better addressed as was the reason for choosing El Salvador and the channel through which gangs affect the economy. Disaggregate data was not found.

I. Introduction

Although countries in Central America share a common history and geography, there are wide variations in GDP per capita and GDP growth throughout the region. In an attempt to see the effects of specific changes in Anti-Gang Policies on GDP growth across countries, this paper analyzes the effect of “Mano Dura”, an anti-gang and drug-trafficking policy in El Salvador. Pre and post implementation data were run through a discontinuity regression model in order to analyze the immediate and longer term effects of the policy on criminal, wealth and poverty statistics. These results were then compared to the average effect across the rest of Central America and specifically to Guatemala, which was following a similar track as El Salvador before 2004.

I found that although the effect of the policy on homicide appears to be consistent with previous papers, which report that increased policing of gangs initially provides incentive for competing gangs to fight for territory (Rios 2011), the immediate increase in homicides was found to be statistically insignificant. However, the change in homicide rate over time out performed the rest of Central America, which may indicate the effective settling of violence as a result of the policy. This result was then reversed in the comparison to Guatemala alone. It is difficult to determine whether all of Central America or just Guatemala serves as a better control.

I also found an ambiguous immediate effect on wealth and poverty indicators. The lack of a wealth effect is not surprising seeing as changes in growth tend to occur over time. Any discontinuity in the future due to this policy is also difficult to measure due to the presence of the recession. No real significant changes in Investment, tourism or openness were observed. The poverty statistics showed a significant change towards an increasing poverty level, but an insignificant change in the GINI wealth inequality indicator. This may show that anti-gang policy singles out less wealthy individuals while providing infrastructure for growth in the middle class. Many factors may contribute to the insignificant immediate effects of the Mano Dura legislation, which are addressed in later sections.

The long term results must also be analyzed further due to the possibility of spillover effects. Though, with the assumption that Central America is strategically centered, so that its relation to the drug trade and economic tides fluctuate similarly across the region, the policy implementation appears to have tempered negative long term effects. One of the main difficulties in assessing this result is the possibility that violence increased outside of El Salvador due to spillover effects meaning that the policy didn't have a net benefit in the broader region. The use of Guatemala as a control seems to counter this view as well as the positive observations on El Salvador. With Central America as the control and looking specifically at El Salvador we may still conclude that attempts to curb gang prevalence as measured by the homicide rate improves wealth statistics over time.

The following section provides background about the alarming statistics of the drug trade, its importance to the United States, and about the specific policy being addressed. Section III describes the discontinuity model and difference in differences t-test used in this paper. Section IV highlights the important findings from the models. Section V provides possible explanations for the results. Section VI will sum up the key findings and the points to take away.

II. Background

The countries of Central America: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama, have a deeply integrated history and economy. However, since attempts at governing this area under the control of a united government failed in the 19th century, the relative wealth of these economies has diverged. I aim to assess whether this divergence in wealth can be at least partially attributed to the emergence of the drug trade, which has been correlated with violence, corruption and negative economic consequences (Seelke, Wyler, and Beittel, 2010). With this in mind, I look at the effect of specific legislation aimed at reducing gangs related to drug trafficking.

Central America is now proving to be a battle ground for a burgeoning drug trade. The Washington Post states that one third of the total mass of cocaine flows through Honduras alone (Miroff 2011), which, according to the World Bank, also suffers a homicide rate of 82.1 per 100,000 inhabitants, the highest in the world. According to the United Nations Office on Drugs and Crime, the homicide rate in Central America is second only to Southern African when comparing global subregions. Although, the prevalence of violence isn't solely in response to drug trafficking, the 2011 Global Study on Homicides reported that the increase in homicide rate is correlated with an overall increase in drug flow through Central America. These statistics are complicated by the fact that violence is typically between competing gangs and sparks when "the status quo" is affected. This suggests periods of lower drug flow may lead to increase competition among gangs. This, however, is primarily in well established grounds such as Mexico, therefore violence in Central America is more positively related to gang violence due to increased drug trafficking.

The largest sources of gangs in Latin America are from Mexican and Colombian based trade, which handle between \$18 and \$39 billion in "drug proceeds" (Seelke 2010). The largest consumer of drugs from Colombia and Mexico is the United States, which has a wholesale market for drugs estimated at \$16 billion (Guerrero 2011). Although these numbers can only be seen as estimates due to the

difficulty in tracing the drug trade, they give a staggering portrait of the economic incentives and the importance with which the United States should view the alarming trends in Central America, which are due, in large part, to the negative externalities of U.S. consumption. It is important for the United States to continue to work with Central American countries to observe effective policy strategies which may counteract the current trends.

Previous policies in South America have shown the difficulty in effective policy making. Attempts to curb production in Colombia have been shown to simply divert production to neighboring states, namely Peru (Leech 2010). Another problem for policy making is avoiding negatively affecting lower income groups. As also discussed by Leech, drug related crops have a much higher yield to poor farmers than legal cash crops. Policies of eradication and the like have proven to create turmoil outside of the more traditional criminal personalities. To that effect it is necessary to demonstrate positive economic incentives.

The effects of gangs on the economy are related to their overall effect on infrastructure, actual and perceived. Gangs often lead to corruption as mentioned above and an overall increased level of crime. Drug trafficking can even lead to political instability as witnessed in Honduras with the ousting of president Zelaya. In this state investors may be very unwilling to engage in transactions. Also the presence of staggering homicide statistics and the like may be enough to discourage businesses from starting plants in the region. Decreased investment and long term savings slow growth and reduce output. Motions to restore confidence in the economy and overall order in the country should improve long term growth through investment channels alone.

To that effect, this paper aims to address the direct economic effects of a strict anti-gang program on drug trafficking and wealth statistics. Many different policies came to mind in order to study this effect, but limitations on data made most of them difficult to observe. The Merida initiative was

signed into law by the United States in 2008. It provides \$1.6 billion for counter trafficking measures. This policy is especially convenient in that you would be able to compare the effect for several countries, which would increase the validity of the measurement. However, the Merida initiative is too recent to accurately measure changes in wealth indicators especially because the payments are paid out over time and are spent on new equipment and training, which aren't immediately effective.

I will be analyzing the El Salvadorian legislation called Mano Dura, which was implemented in 2003. El Salvador is a strong model country because of its relatively small size and its large initial crime rate. This should make effects on homicide and wealth more pronounced because of the large room for improvement in crime and the low level of other economic factors which may dilute any observed effects. Although this specific policy has been heavily criticized for its apparent human rights violations and its reverse long term effects of uniting gangs in the prison system, this policy has the advantages that it only affects gang prevalence, there is sufficient data around the time period for both wealth and drug statistics, and the policy essentially flipped a switch allowing police to arrest anyone who may be suspected of gang association. The last reason creates the possibility of doing a linear regression discontinuity model. Also, since the policy is country specific, we are able to determine long term effects by comparison across countries in Central America and against Guatemala.

III. The Model

In this study I aim to describe the overall effectiveness of government policies against gangs and drug trafficking by looking specifically at the Mano Dura legislation in El Salvador. In order to find the immediate effects of the Mano Dura policy, I employed a linear regression discontinuity design. The equation used was of the form

$$Y = \alpha * \text{YEAR} + \beta * (\text{Post 2003}) + \lambda * (\text{Post 2003}) * \text{YEAR} + \epsilon$$

where Y was the independent variable either: GDP per Capita, GDP growth, homicides, cocaine seizures, GINI and the % below national poverty line. Post 2003 is a dummy variable which captures the policy implementation in the year 2003. The slope is allowed to change after the policy implementation. The change in slope is captured in the variable λ , which is an interaction term that captures the effect of the policy over time. This statistic is used later on to compute the longer term effect of the policy. The discontinuity is measured by computing $\lambda * 2004 + \beta$. The switch was chosen to be 2004 so as to capture the initial effect of the policy in the coefficient of the dummy variable. The policy initiated “police-military patrols” and “permitted the arrest of suspected gang members on the basis of their physical appearance alone” (Wolf 2012). The subsequent legislation should have a weaker effect due to the presence of the initial creation of anti-gang laws, which went into effect, albeit controversially, immediately.

The wealth statistics investigated in this study are assumed to move more slowly than the homicide rate. The propagation would occur throughout time. Being unable to estimate in what period the effects are likely to take place and noting that the effect might be spread over time, the second part of the analysis was dedicated to viewing the long term change in trends associated with the policy. The underlying assumption is that trends in drug trafficking were changing across this period of time for all of Central America. With this in mind, I applied the model used above to every Central American country in order to calculate λ , the interaction term, for homicide rates and GDP growth. The interaction can be seen as the developing trend in these statistics at the time under inspection. For instance, since overall homicide rates increased more rapidly during the second half of the decade we expect the average λ to be positive.

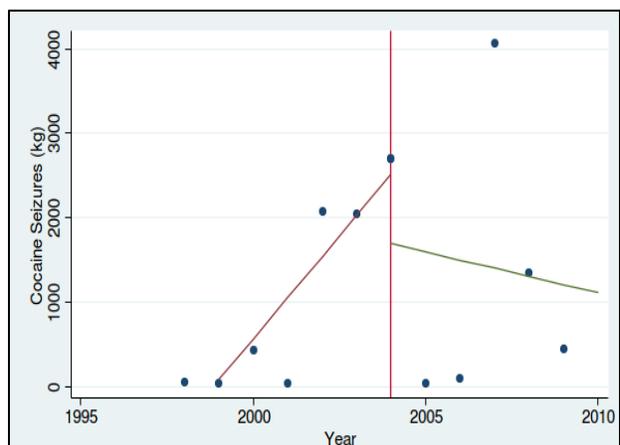
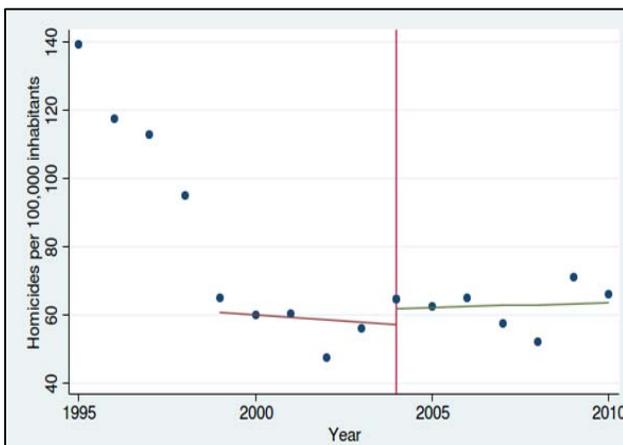
The average for Central America is estimated as a control due to its location between cocaine producers, Colombia, Peru and Bolivia, and consumers, The United States. The geographical location

implies that macroscopically there is no choice, but to go through Central America. Central America has also historically moved concertedly in terms of changes in growth as evidenced in the paper “Economic Growth and Integration in Central America” (Desruelle 2007). Both of these statements suggest that the average of the remaining Central American countries may act as a control for El Salvador without the policy intervention. The analysis incorporates a t-test to evaluate if there was a significant change in the trend for homicide rates and GDP growth between El Salvador and the remainder of Central America.

Looking more closely for a direct control, I applied these models to the other countries in Central America looking for a country that had similar trends as El Salvador up to 2004. Guatemala seemed to meet this requirement and was also favored because it borders El Salvador. Any spillover effects should then be heightened for Guatemala leading to an overestimate of the effect of the policy on drug trafficking statistics if there is one.

IV. The Data

The data was taken from the World Bank except for the statistics on Seizures which was taken from the United Nations Office on Drugs and Crime’s World Drug Report for 2011 and 2005. The first expectation of the policy was for there to be a direct effect on gang and Drug trafficking statistics. Below are the discontinuity regression graphs for drug seizures and homicide rates



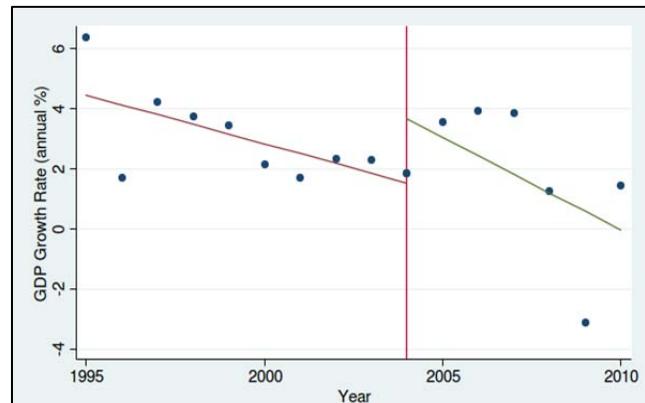
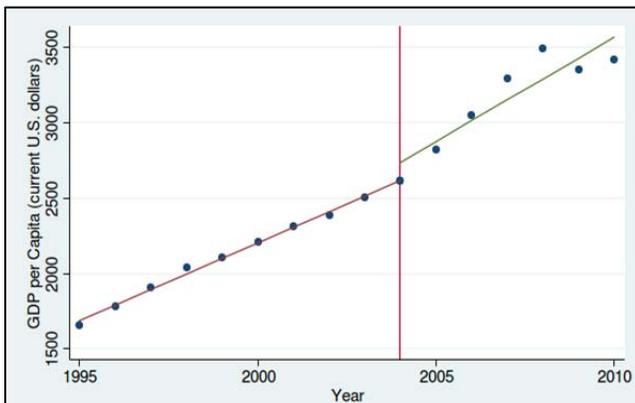
Homicides	Coefficient	Standard error	t	P> t
Year	-.760535	1.57264	-.48	.640
Post*Year	1.060536	1.84482	.57	.579
Post	-2120.569	3693.024	-.57	.580
constant	1581.012	3146.169	.50	.627

Cocaine Seizures (kg)	Coefficient	Standard error	t	P> t
Year	486.7909	67.5991	7.20	0.000
Post*Year	-583.6617	297.8429	-1.96	0.082
Post	1168837	597643.4	1.96	0.082
constant	-983015	135291.9	-7.19	0.000

For the homicide rate the regression was measured after the year 1998. The high murder rate before this period is residual effects of the Civil War which took place earlier in the decade. Only viewing the area after a stable growth rate is established allows a better view of the policy change in the desired time period. Using the method above we find a discontinuity of 4.745144 homicides per 100,000 inhabitants, but this value is statistically insignificant due to the high p-value. The limitation of only having yearly data makes it difficult to determine significant values for graphs with low slopes.

The scatter plot of the cocaine seizure rate shows one of the difficulties of using this as an accurate measure of drug trafficking on a microscopic level. The weight of seizures is highly variable and depends on chance. That being said there appears to be a relatively significant (90% confidence) change in slope and intercept at the year of the policy intervention. The calculated discontinuity is -821.0468 kg, which may indicate a change in priorities for the police after the anti gang laws came into effect.

The following graphs show the wealth and poverty statistics measured

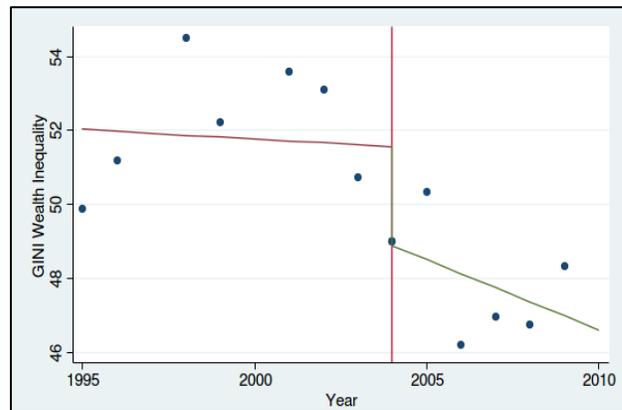
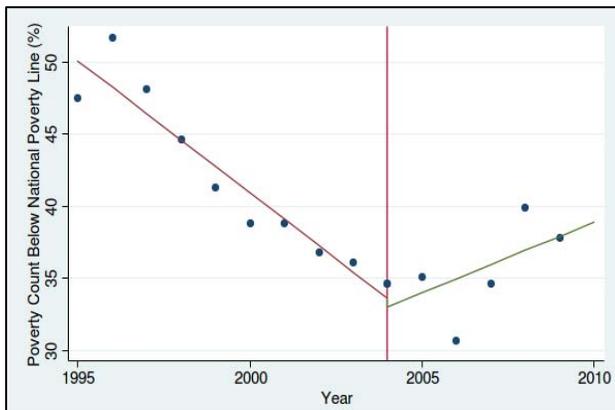


Per Capita	Coefficient	Standard error	t	P> t
Year	103.415	2.462731	41.99	0.000
Post*Year	36.40944	25.49714	1.43	0.177
Post	-72850.1	51152.05	-1.43	0.178
constant	-204624.6	4928.246	-41.52	0.000

GDP Growth	Coefficient	Standard error	t	P> t
Year	-.3254218	.1730848	-1.88	0.083
Post*Year	-.2925217	.4575443	-.64	0.534
Post	588.3608	917.6131	.64	0.533
constant	653.6708	346.4104	1.89	0.082

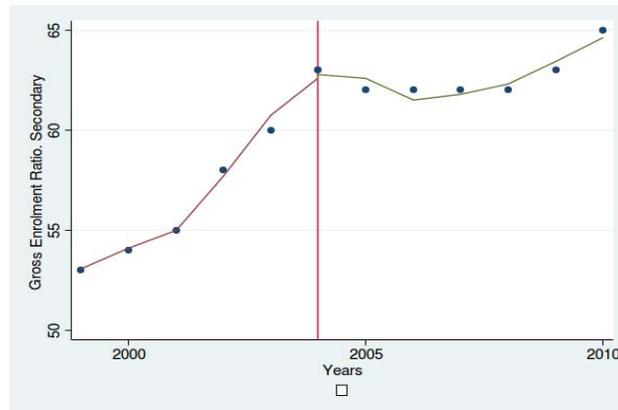
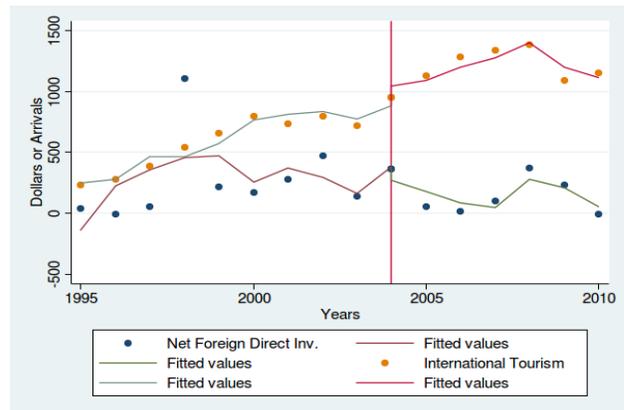
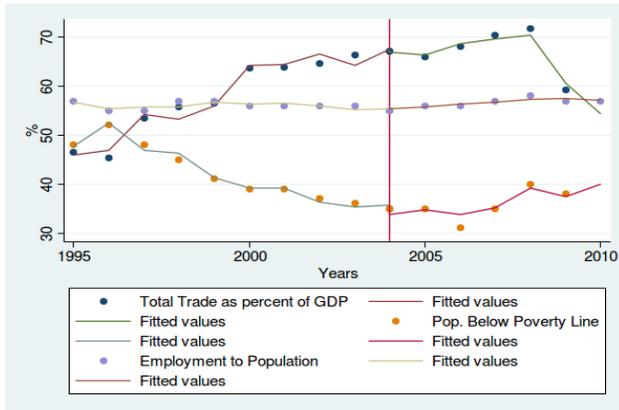
Poverty %	Coefficient	Standard error	t	P> t
Year	-1.829604	.2531438	-7.23	0.000
Post*Year	2.809604	.5049756	5.56	0.000
Post	-5631.04	1012.652	-5.56	0.000
constant	3700.12	506.6148	7.30	0.000

GINI Index	Coefficient	Standard error	t	P> t
Year	-.0520738	.2609768	-.20	.846
Post*Year	-.3282119	.4049696	-.81	.438
Post	655.0546	811.4708	.81	.438
constant	155.9171	521.8628	.30	.771



In the case of wealth and poverty ratings, we see ambiguous effects of the policy. Although it seems there is a statistically significant negative change in poverty slope there is a less significant change towards a more equal distribution of wealth shown in the GINI index. Similarly the GDP per capita shows an increase in slope with 80% confidence, where as there is a less significant negative change in annual GDP growth.

Additional effects were measured controlling for population growth, CPI, %population in urban areas, inflation and population density:



GDP SLV	Total Trade	Employment	Poverty	FDI (millions)	Tourism (thousands)	General Enrollment
Post	2951	-2960.33	-372.6	210888	-93092	7528
Post*Year	-1.473	1.477	.1849	-105.288	46.53	-3.76
P > t	.204	.045	.844	.645	.505	.118

Most notably we see a significant positive long term impact on the employment ratio.

This may be a precursor for growth in the future or an indicator of negative wealth effects requiring additional employment presumably from the youth.

The data for the Post*Year coefficient are shown below along with the values for the t-test comparing the values for El Salvador vs. the average of the remaining countries in Central America.

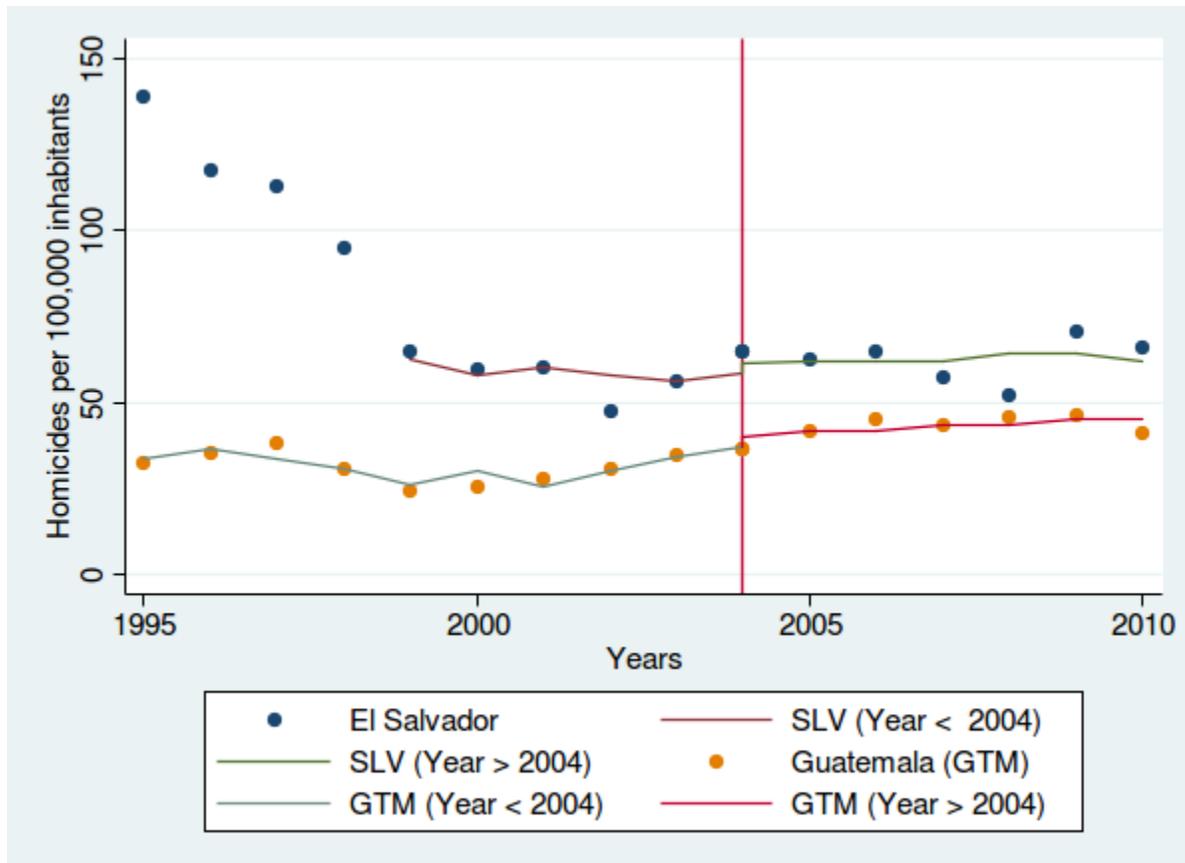
λ	Honduras	El Salvador	Guatemala	Nicaragua	Costa Rica	Belize	Panama
$\Delta \frac{d(Growth)}{dYear}$	-1.20246	-.29252	-.09279	-.16686	-.75495	-1.04883	-.64832
$\Delta \frac{d(Hom)}{dYear}$	11.47948	1.06053	.95422	.57934	.70449	-.29602	2.57014
(/total)	(.1398)	(.01607)	(.02305)	(.04389)	(.06234)	(-.00709)	(.11899)

T-test: Central American Avg. without El Salvador vs. El Salvador	Observations	Mean	Std. error	t	Ha: Mean < -.2925 Pr(T<t)	Ha: Mean > 1.061 Pr(T>t)
$\Delta \frac{d(Growth)}{dYear}$	6	-.6523722	.1843154	-1.9525	.0542	
$\Delta \frac{d(Hom)}{dYear}$	6	2.665276	1.803626	.8895		.2072
(/total)		(.042875)	(.04422)	(1.484)		(.0989)

This data shows that El Salvador showed a significantly larger change in $\frac{d(Growth)}{dYear}$ (ddG) around the period of the policy at roughly a 95% confidence level. El Salvador also had a below average change in $\frac{d(Hom)}{dYear}$ (ddH) at 80% confidence. A closer look at the data shows that only one country had a larger ddG, where as 4 countries actually had a lower ddH. However, when standardized by the 2010 homicide rate, only one country has a lower ddH and the difference to the average is significant at 90% confidence.

The following graphs compare Guatemala and El Salvador. In these regressions I took a more stringent approach in order to find true effects of the policy. To this effect I added controls for

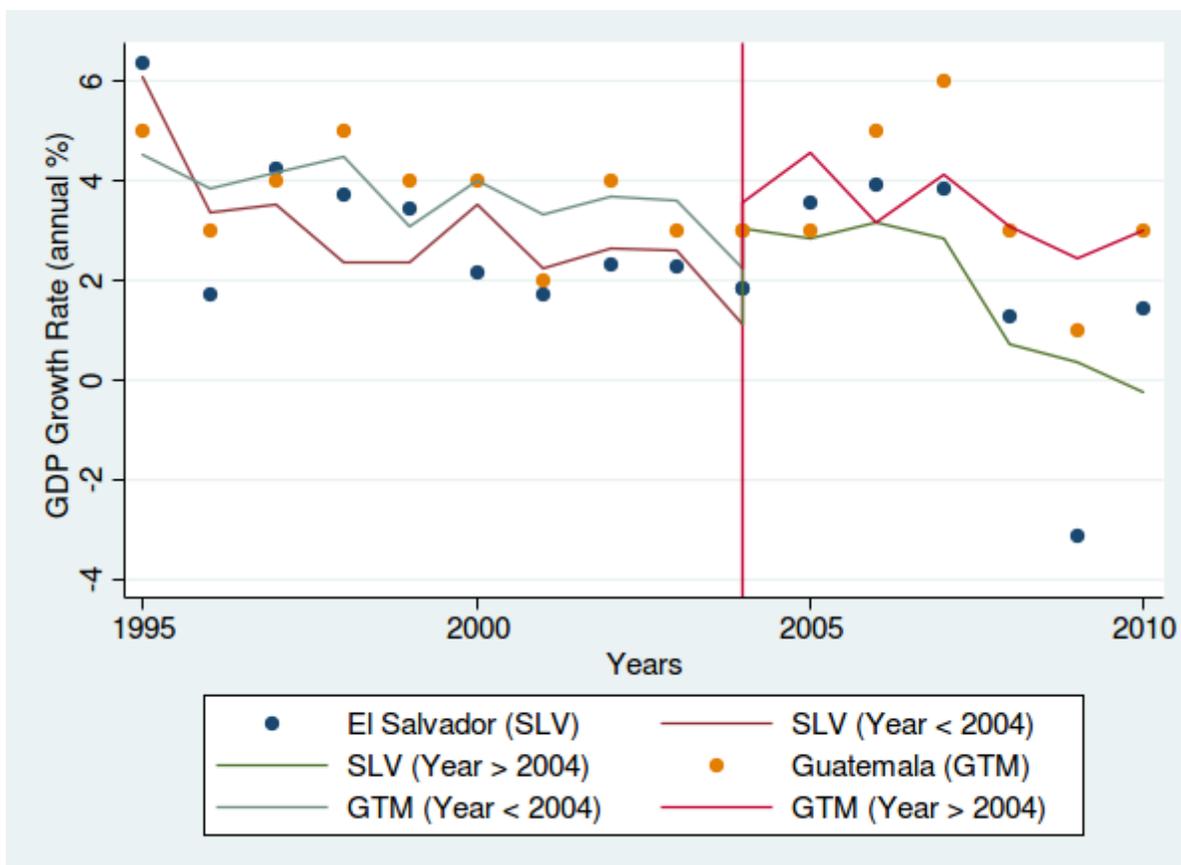
population dynamics which may affect homicides, % urban population and population density. In the GDP regressions I added controls for financial deviations and overall population: inflation, cpi and population growth:



Homicides SLV	Coefficient	Standard error	t	P> t
Year	.6625	6.109	0.11	.917
Post*Year	2.205968	2.556	.86	.417
Post	-4417.652	5122.8	-.86	.417
Density	-2.637532	4.92175	-.54	.609
%Urban	4.2788	8.618239	.50	.635
constant	-758.34	10868.74	-.07	.946

Homicides GTM	Coefficient	Standard error	t	P> t
Year	-17.299	3.414435	-5.07	.000
Post*Year	-2.5794	.957777	2.69	.021
Post	5172.11	1920.992	2.69	.021
Density	7.196	1.339886	5.37	.000
%Urban	-1.649292	2.128185	-.77	.455
constant	33948.06	6684.103	5.08	.000

These numbers suggest uneven higher effect on homicides than first perceived without the additional controls. What's more surprising is that the effects on Guatemala were for a statistically significant reduction in the homicide rate.



GDP SLV	Year	Post*Year	Post	Pop. Growth	Inflation	CPI	%Urban	Density	Constant
Coef	.84796	.38367	-766.96	-2.409278	-.2821922	-.0926	-.4818	-.8149	-1422
P > t	.514	.713	.712	.322	.573	.819	.747	.668	.517
GDP GTM	Year	Post*Year	Post	Pop. Growth	Inflation	CPI	%Urban	Density	Constant
Coef	2.917	1.227	-2457.59	.06517	.3291	-.27611	-1.708	-.4135	-5692
P > t	.483	.618	.618	.987	.527	.694	.351	.664	.488

With the additional controls the long term effects of the policy are of no significance on the GDP for either country.

V. Analysis

The data seem to support the conclusion that although many of the statistics show varying effects around the period of the intervention, there were few statistically significant immediate effects associated with the implementation of the Mano Dura policy in El Salvador. Most concerning is the change in slope of the headcount poverty rate which significantly increased around the policy intervention. The results of the t-test show that El Salvador performed better in the measured statistics of homicide rate and GDP growth across the implementation period, but due to several difficulties encountered in this study it's difficult to connect this directly to the policy. These improved results are also lost when directly compared to Guatemala, a neighboring country following a similar track at the time of the intervention.

The largest difficulties in this study can be separated into the problems within El Salvador and its relation with Central America as a whole. One of the problems in a study like this is that it is difficult to determine the credibility of the policy itself. In a more complete study, I would try to evaluate statistics that speak to this criticism. Its occurrence around an election year presents the possibility that there was little incentive to enforce this act after it was passed. However, the presence of an addition to the policy after the election, Super Mano Dura, suggests that this was not the case. One might also argue that El Salvador simply didn't have the resources necessary to successfully implement the policy or that the police force could have been incentivized not to put the policy into full force. This argument is more difficult to counter. By looking at the seizure rates, it appears there may have been a trend away from

looking for drugs. If this was correlated with an increase in incarceration rates, then the change in seizure rates would represent a shift in priority and therefore the active participation of the police force. I found it difficult to find a significant number of data points for incarceration rates in El Salvador. As it stands, it is difficult especially due to the chance nature of cocaine seizures to make this extrapolation.

Along with the issues within El Salvador as far as being able to implement the policy are the results of the wealth statistics. The counterintuitive results of the wealth inequality measures are difficult to interpret. The statistic $\frac{d(Poverty \%)}{dYear}$ increases significantly although the GINI equality of wealth indicator appears to decrease over this period of time. The change in the headcount poverty % is especially concerning given the appearance of revolts in Peru from crop eradication policies. It is important to note that the increase in the poverty rate occurred before the global financial crisis, and, more importantly, before the GDP growth rate began to decrease.

One can explain this effect if police are naturally biased to assume that individuals who look less wealthy are more likely to be associated with gangs, the policy may have directly made it more difficult for lower class individuals to stay above the poverty line. Another possibility takes into account that the majority of gang members take a very small share of profits as shown by Levit (2000). If the poverty line is below the average wage of a "foot soldier" in a gang then successful gang dismembering could naturally lead to an increase in the poverty rate. This implies that a high percentage of the target group is probably near the poverty line and may suffer from a drop in profits. More generally, gang eradication eliminates a general source of revenue.

On the other hand Pool and Bollen's (2009) analysis of hedge fund managers shows that given proper incentive people naturally tend to misrepresent certain statistics if it is convenient to do so. In this case, it is possible that the presence of potential external aid may have created a drive to overstate the need for help without a higher rate of inequality. This may also explain how the slope of the per

capita income also increased over this period of time while poverty rates increased. It also happens that funding from the United States was passed only 4 years after the intervention period through the Merida Initiative.

Overall, we would expect an increase in long term production in the economy due to a more positive “atmosphere for doing business”. Elimination of gang and drug trafficking organization are thought to decrease corruption and improve market conditions as well as increase confidence, which may increase domestic and foreign investment. Foreign direct investment was not significantly affected by the policy, nor was tourism, which could be seen as a different kind of confidence indicator. However it is possible that analyze those statistic along with GDP in El Salvador alone are made more difficult due to the presence of the global financial crisis. This is one of the reasons that cross country inspection was undertaken.

From the difference in differences model using the t-test, we see that, with 90% confidence, El Salvador was able to curb homicide trends occurring across Central America during this time period. It also performed better in the trend for GDP growth. In looking at these statistics however it is necessary to observe the limitation in this model. One of the biggest problems is described by Melissa Dell’s (2011) paper on trafficking networks. This paper describes the spillover effects of anti drug trade policy on neighboring counties. A possible criticism for this paper is that the policy in El Salvador may have negative consequences for the surrounding areas. This has two large implications. First, the effect of spill over due to the policy will inflate the change in the homicide statistic. This would violate one of the assumptions that the rest of Central America can be seen as a control for El Salvador because it would also be affected by the policy. Second, If drug trafficking is merely rerouted outside of El Salvador then the benefits accrued in El Salvador would simply be hurting the surrounding countries. Both of these perspectives suggest that any benefits found would be overstated.

On the other hand, the same effect could be seen in the reverse. That is to say any policy undertaken by neighboring countries could have an effect on the statistics measured for El Salvador. In order to accept the analysis of long term effects found in this paper, it is necessary that all countries in Central America were combating the drug trade at roughly the same level. This would say that the legislation passed in El Salvador was above and beyond the same level of gang control across Central America. The number of articles assessing the severity of this policy and its human rights violations may actually be an argument for why this policy is still an effective instrument. The more drastic this law is compared to average tactics the more we can extrapolate from the results. A more exact way of removing the effect of spillovers would be to observe a policy enacted in every country such as the funding from the Merida initiative, but this eliminates the opportunity for a control group at all.

Aside from the spillover effect making it difficult to create an effective control group for El Salvador, there are the normal concerns of confounding variables affecting the results. A host of variables not described in this paper could have made the economy more stable over the period of the recession aside from the improvements in infrastructure associated with a reduction in corruption stemming from the presence of gangs and drug trafficking. We attempted to counter this by the method of difference in difference and the use of several controls. One of the reasons I didn't simply want to look at the final values of GDP growth or even just the final slope is that these don't directly capture the effect of the policy. If the homicide rate was already growing disproportionately in an area, you wouldn't expect the post policy rates to be comparable to an area with a lower initial growth in homicide rate. By checking the difference in slopes before and after, I attempt to disclose a trend change which should be independent of all but a few other variables, which aren't likely to change across this period of time. Variables that do change in this period are accounted for by averaging the broad changes across Central America, which is reasonable due to the precedence of concerted changes in growth.

Depending on which effect the spillover or the stabilization of confounding variables by the difference in differences set up dominates, we may conclude that the results from that particular test are the most telling. The results indicate that there is in fact a positive effect on wealth statistics due to counter gang policies as quantified by long term change in homicide statistics. The insignificant discontinuity most likely due to the small number of data points, makes it difficult to estimate a value for the homicide elasticity of wealth.

The effects of spillovers should be most notably addressed in the Guatemala vs. El Salvador comparison. However this study showed no significant effect from the policy for either country, and if there was any, Guatemala seemed to outperform El Salvador. This strongly contradicts our data from the Central American comparison. It is hard to say, which one is more valid. The early resemblance between El Salvador and Guatemala means Guatemala could be a much more effective control. It had a relatively steady and relatively high homicide rate like El Salvador as well as a similar curve for GDP growth. However if I failed to take into account a confounding variable which isn't correlated with drug trafficking statistics, it is possible that the effect would be much larger for the single country comparison.

This being said if we accept the findings from the composite comparison, the overall positive correlation between curbing homicide rates and increasing growth rates ultimately suggests a possible explanation for the divergence in wealth amongst these countries. Although they seem to fluctuate concertededly some countries have benefited more than others historically. The ability to change growth via anti-gang measures shows that these economies are exposed to flaws in infrastructure correlated with gangs. If these differences were reduced, we would expect greater convergence in growth rates in the region as specific crime rates are variable.

VI. Conclusion

The staggering growth in homicide rate across Central America now has governments scrambling to evaluate the proper implementation of anti-gang and drug-trafficking policies. Policy makers must take into account the effect on crime; the effect on poverty statistics where less wealthy individuals dependent on gang and drug trafficking income have been shown to revolt; and the effect on overall wealth with the assumption that improving infrastructure and investment incentive should increase growth.

In this study I found that the long term trends in GDP growth and homicide rates in El Salvador outperformed those of the rest of Central America around the period of the policy implementation. However when compared to a neighboring country in a similar initial state, El Salvador performed worse although the statistical significance of the difference is uncertain. The immediate impact was statistically insignificant for a host of possible reasons alluded to and especially the small number of data points. However, the picture follows our hypothesis that the initial policy intervention would move forces away from seizures and create more conflict early on and settle down later. Also the poverty and wealth statistics showed varying effects of the policy, which may be cleared up with more data or may indicate a more positive effect for the middle class versus the lower class over time. This suggests that policy aimed at targeting gangs may have a more general target of the lower class. At the same time there is increased employment. If we combine the increased poverty, employment and decreased gross enrolment, it is possible that youth are being forced to enter the work force. Those demographics may be addressed in a future study. Throughout this paper it has become apparent that the presence of spillover effects and confounding variables make this experiment difficult to analyze given data constraints. As data comes out from the Merida Initiative, a similar study comparing its effect on each individual country in Central America may be very insightful.

Overall, we see the possible implications looking historically at how these economies may have diverged over time as previously stated. With concerted efforts to eliminate criminal interference it is possible that countries such as Honduras, which suffers the highest homicide rate in the region and the second lowest GDP per capita, may make strides in decreasing these gaps.

I want to make clear that this paper does not attempt to suggest that policies such as the Mano Dura are the right choice for the region. The effect of incarceration of gang members may lead to increases in gang structure and long term negative consequences. I simply use the policy for its expected impact after being enacted.

VII. Resources

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