Definitions:

GM = Gang\_Membership

IN = Incarceration

LE = Law\_Enforcement

MD = Migration\_Displacement

PV = Physical\_Violence

PG = Positive\_Gang\_Perception

PSV = Psychological\_Violence

SD = School\_Dropouts

SV = Sexual\_Violence

SA = Substance\_Abuse  
TM = Teenager\_Mothers

UN = Unemployment

Basic rules:

Rule 1: S\_... represents a stock variable

Rule 2: D\_... represents the time derivative

Rule 3: M\_... represents a moderator variable (not used here)

Derivatives:

Basic rules:

Rule 1: Any flow going from S\_1 to S\_2 with moderator M\_3 should be multiplied by S\_1:

D\_S\_1 = -0.01\*(S\_1)\*(M\_3) + ...

D\_S\_2 = 0.01\*(S\_1)\*(M\_3) + ...

Rule 2: If there is no moderator, replace M\_3 by 1 in the above

[Qi: Please highlight in yellow any changes to your previous equations. I already did D\_S\_GM and D\_IN.]

D\_S\_GM =

+ 0.01\*(S\_PG)\*(Exposure\_to\_Violent\_Media - S\_LE - Family\_Cohesion - Mental\_Health)

+ 0.01\*(S\_MD)\*(Deportation)

- 0.01\*(S\_GM)

- 0.01\*(S\_GM)

- 0.01\*(S\_GM)\*(Gang\_Cohesion + S\_SA)

- 0.01\*(S\_GM)\*(Territorial\_Fights - S\_LE)

- 0.01\*(S\_GM)\*(Gang\_Control - Impunity\_Governance)

)

D\_S\_IN =

+ 0.01\*(S\_LE)

- 0.01\*(S\_IN)~~\*(S\_PG)~~

D\_S\_LE =

+ 0.01\*(S\_GM)\*(Gang\_Control - Impunity\_Governance)

- 0.01\*(S\_LE)

+ 0.01\*(S\_PV)\*(-Impunity\_Governance)

- 0.01\*(S\_LE)\*(Exposure\_to\_Violent\_Media + Bad\_Governance - Youth\_Empowerment + Neighborhood\_Stigma)

D\_S\_MD =

+ 0.01\*(S\_PV)\*(Economy)

+ 0.01\*(S\_UN)\*(Machismo - Economy\_Opportunities)

- 0.01\*(S\_MD)\*(Deportation)

- 0.01\*(S\_MD)\*(- Family\_Cohesion)

D\_S\_PG =

+ 0.01\*(S\_IN)

+ 0.01\*(S\_UN)\*(Exposure\_to\_Violent\_Media)

+ 0.01\*(S\_PSV)

+ 0.01\*(S\_SV)\*(-Gang\_Control + Victimizer + S\_GM)

+ 0.01\*(S\_PV)\*(Family\_Breakdown + Exposure\_to\_Violent\_Media - Mental\_Health)

- 0.01\*(S\_PG)\*(Exposure\_to\_Violent\_Media - S\_LE - Family\_Cohesion - Mental\_Health)

D\_S\_PV =

+ 0.01\*(S\_LE)\*(Exposure\_to\_Violent\_Media + Bad\_Governance - Youth\_Empowerment + Neighborhood\_Stigma)

+ 0.01\*(S\_GM)\*(Territorial\_Fights - S\_LE)

- 0.01\*(S\_PV)\*(S\_SA)

- 0.01\*(S\_PV)\*(Family\_Breakdown + Exposure\_to\_Violent\_Media - Mental\_Health)

- 0.01\*(S\_PV)

- 0.01\*(S\_PV)\*(Economy)

- 0.01\*(S\_PV)\*(-Impunity\_Governance)

D\_S\_PSV =

+ 0.01\*(S\_SV)

+ 0.01\*(S\_PV)\*(S\_SA)

+ 0.01\*(S\_MD)\*(- Family\_Cohesion)

+ 0.01\*(S\_GM)\*(S\_SA + Gang\_Cohesion)

- 0.01\*(S\_PSV)\*(S\_SA)

- 0.01\*(S\_PSV)

- 0.01\*(S\_PSV)\*(Bully - Interventions - School\_Quality)

D\_S\_SD =

+ 0.01\*(S\_TM)\*(Access\_to\_Abortion - Interventions + S\_UN)

+ 0.01\*(S\_PSV)\*(Bully - Interventions - School\_Quality)

+ 0.01\*(S\_PV)

- 0.01\*(S\_SD)\*(Neighborhood\_Stigma + Extortion - Economy\_Opportunities)

D\_S\_SV =

+ 0.01\*(S\_SA)\*(-Economy\_Opportunities + Gang\_Affiliation - S\_LE - Mental\_Health + S\_SD)

+ 0.01\*(S\_GM)

+ 0.01\*(S\_PSV)\*(S\_SA)

+ 0.01\*(S\_UN)\*(Exposure\_to\_Violent\_Media + Family\_Breakdown - Youth\_Empowerment - Gang\_Control)

- 0.01\*(S\_SV)\*(-Access\_to\_Contraception)

- 0.01\*(S\_SV)

- 0.01\*(S\_SV)\*(-Gang\_Control + Victimizer + S\_GM)

D\_S\_SA =

+ 0.01\*(S\_GM)

- 0.01\*(S\_SA)\*(-Economy\_Opportunities + Gang\_Affiliation - S\_LE - Mental\_Health + S\_SD)

D\_S\_TM =

+ 0.01\*(S\_SV)\*(-Access\_to\_Contraception)

- 0.01\*(S\_TM)\*(Access\_to\_Abortion - Interventions + S\_UN)

D\_S\_UN =

+ 0.01\*(S\_SD)\*(Neighborhood\_Stigma + Extortion - Economy\_Opportunities)

- 0.01\*(S\_UN)\*(Exposure\_to\_Violent\_Media - Youth\_Empowerment + Family\_Breakdown - Gang\_Control)

- 0.01\*(S\_UN)\*(Machismo - Economy\_Opportunities)

- 0.01\*(S\_UN)\*(Exposure\_to\_Violent\_Media)