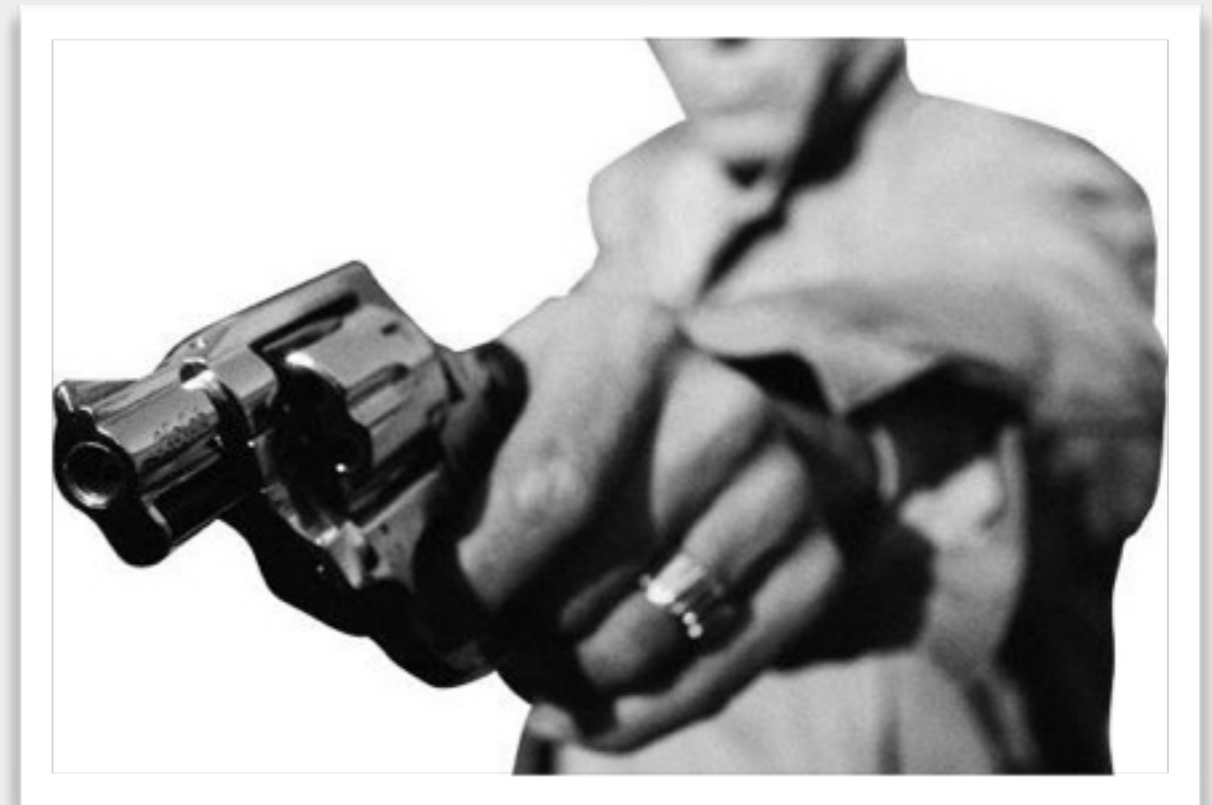


Simulating Extortees: Group Structures and Reasoning Modes

Corinna Elsenbroich

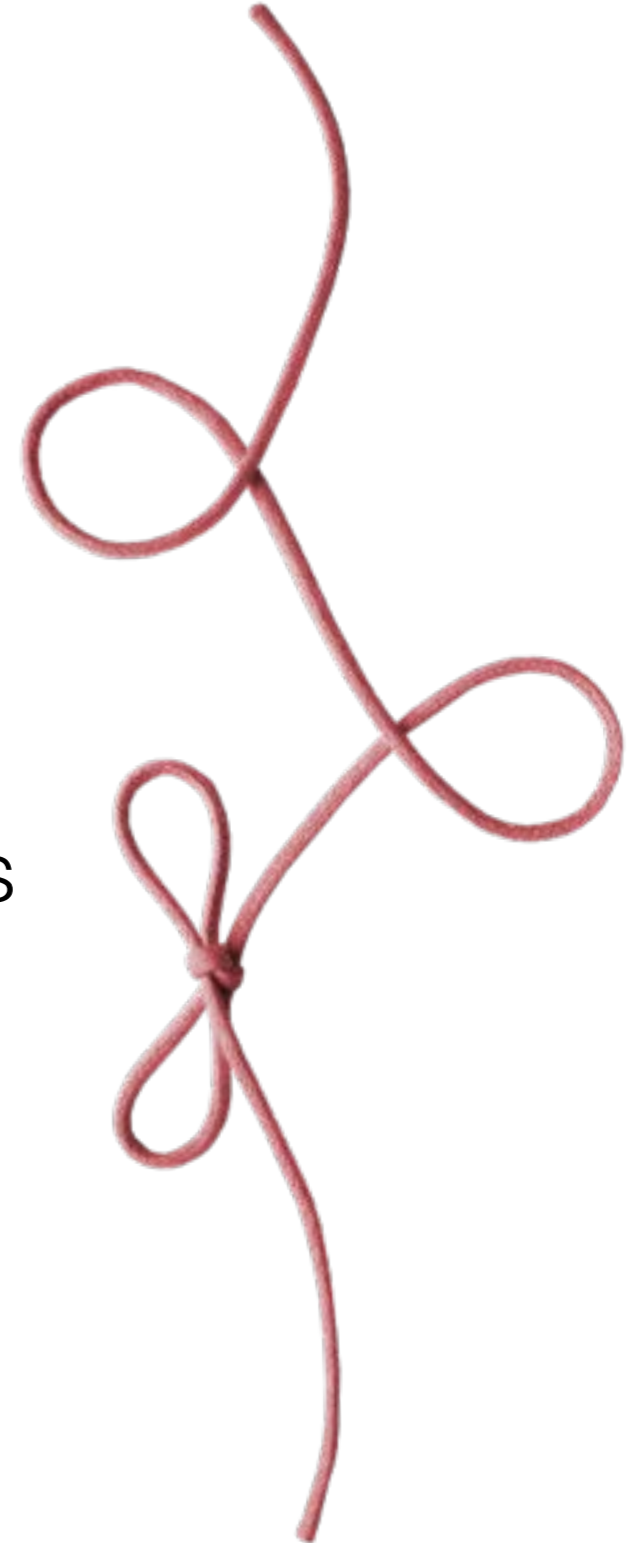
ESSA

Barcelona, September 2014



Storyline

- Collectives, Dilemmas and Extortion Rackets
- A little model of Mafiosi and Fakers
- Collective responses to individualist problems
- Conclusions and future work



Collectives (and their Tragedies)

Collectives (and their Tragedies)



Collectives (and their Tragedies)



Collectives (and their Tragedies)



Collectives (and their Tragedies)

Public Goods



Public Services



Collectives (and their Tragedies)

Public Goods



Public Services



Collectives (and their Tragedies) Everywhere

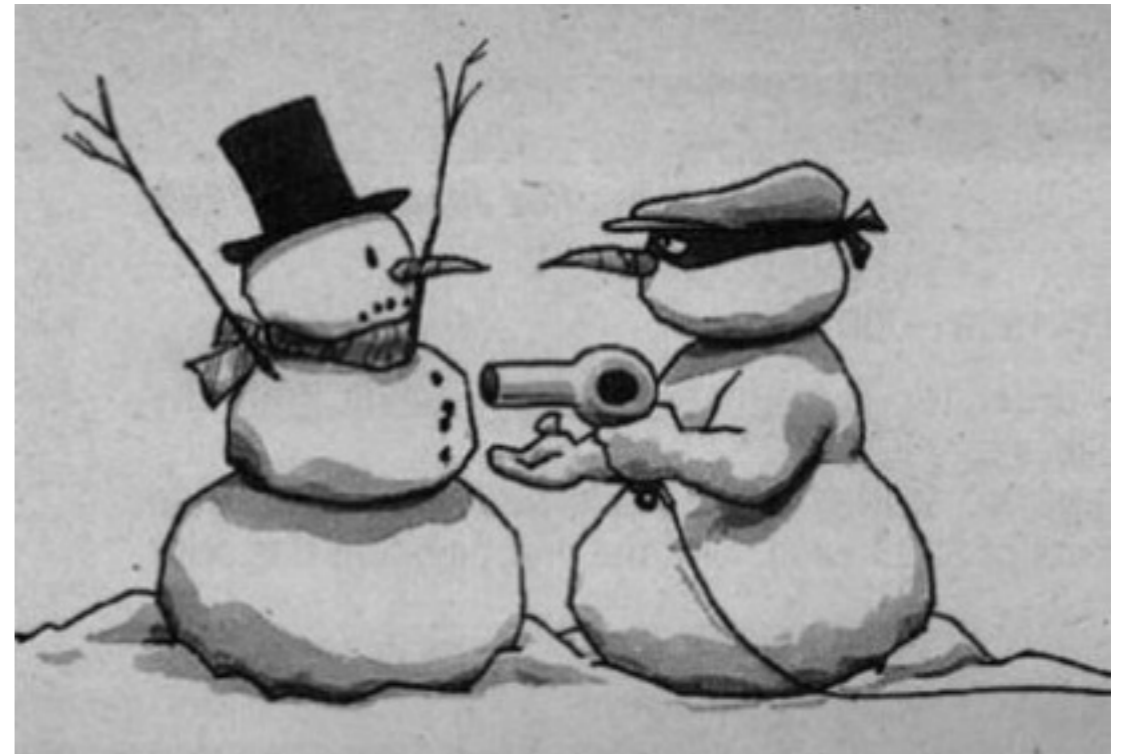
Public Goods

Public Services



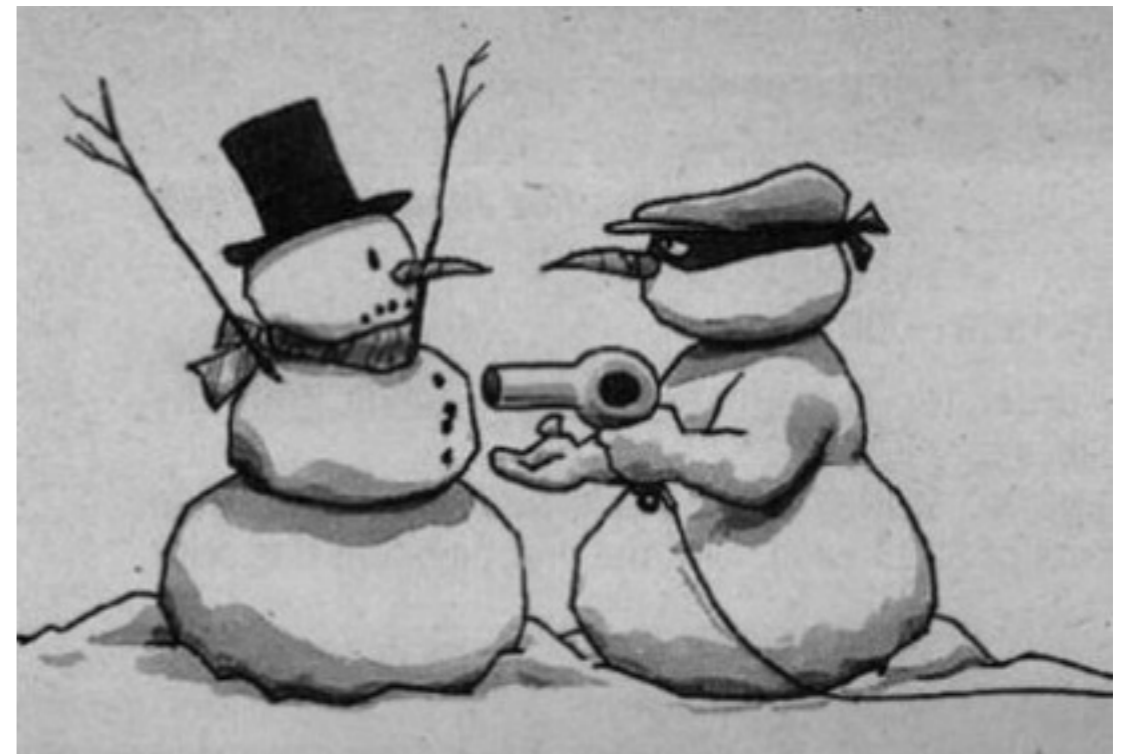
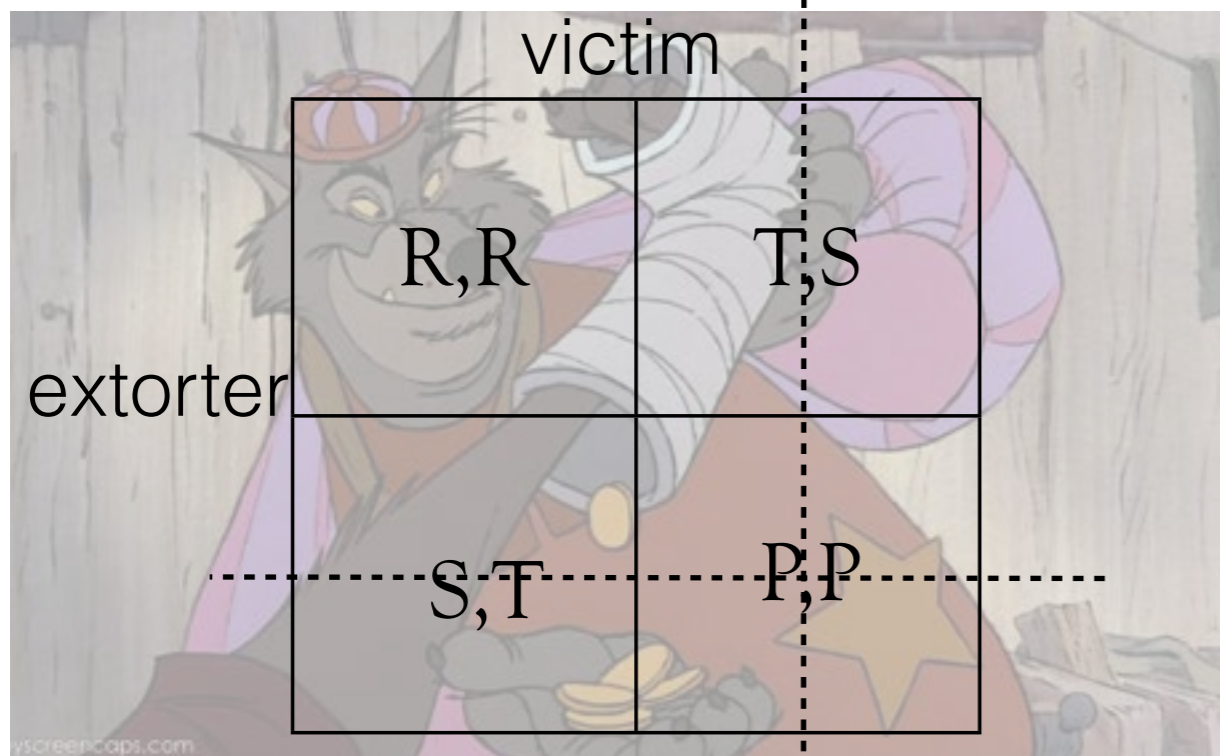
Extortion Rackets

- Extortion is the demand for money on threat of punishment
- Extortion is practiced mostly by criminal organisations, Mafia type organisations
- Extortion usually involves a long term relationship between perpetrator and victim
- The decision matrix of extortion reads like a PD



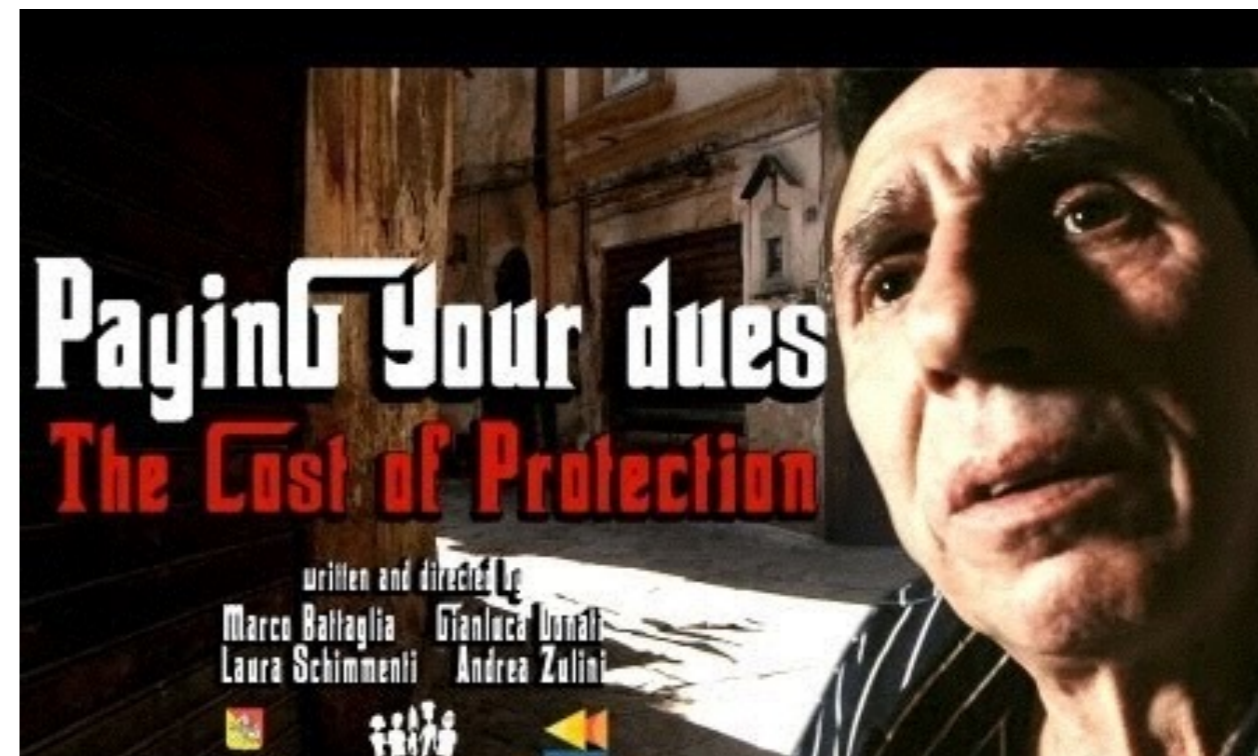
Extortion Rackets

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Extortion Rackets

- 80% of shops in Sicily pay the Pizzo
- Italian Mafia is Italy's biggest business with £116bn (7% of GDP)
- Extortion racketeering exists on all 6 continents
- Extortion rackets go global (Russian Mafia, Chinese Mafia, Italian Mafia)



Spider Men



VIKTOR BOUT



■ The world's most notorious arms dealer, Bout is widely known as the "Merchant of Death"; he served as inspiration for the title character in Andrew Niccol's 2005 film, *Lord of War*.

■ Fluent in Russian, French, Spanish, Arabic, English, and near-fluent in Portuguese, German, Farsi, Urdu, Xhosa, and Zulu.

■ Accumulated, over 17 years, a private air force as large as that of many NATO countries.

■ Has received as much as \$60 million to ferry supplies to American forces in Iraq.

CHARLES McARTHUR GHANKAY TAYLOR



■ One of West Africa's most bloodthirsty warlords, Taylor in 2009 is scheduled to defend himself from charges of killings, mutilations, rape, other forms of sexual violence, sexual slavery, recruiting and using child soldiers, abduction, and using forced labor, at the Special Court for Sierra Leone in The Hague, Netherlands.

■ Doped his legions of child soldiers, called "Small Boy Units," with insufflated cocktails of cocaine, gunpowder, and amphetamines before attacks.

■ Sold Al Qaeda \$20 million in diamonds in 1998.

■ "[Taylor] said we should eat them. Even the U.N. white people—he said we could use them as pork to eat."

— Joseph "Zigzag" Marzah, Taylor's former death squad commander

RUSSIAN MOB



■ After the fall of the Soviet Union in 1991, the Russian mob flourished, deeply involving itself in prostitution, drug trafficking, sexual slavery, extortion, and political corruption.

■ "The bar owners who bought these girls like to keep them nice and quiet. So they buy drugs from some of the U.N. medics to do so. When a girl has finished her shift, she is taken to her room by a bar man and given a shot. When she wakes up she is ready for her next shift."

— Anonymous aid worker, 2006

YAKUZA



■ Members of the Yakuza, the Japanese mafia, consider themselves modern-day descendants of samurai.

■ Yakuza gangsters provide kidnapped women with short, pleated skirts, and knee socks to cater to the "schoolgirl" sex market.

■ There are 110,000 active members of the Yakuza, divided into 2,500 families.

■ Unwanted Chinese boys fetch \$5,000 on the Tokyo black market.

Map by Hisham Hussein

Mafiosi and Fakers



- Entrepreneurs
- Extorters: Mafiosi or Fakers
- Mafiosi extort and punish, Fakers only extort, never punish
- Entrepreneurs decide to pay or not depending on experience

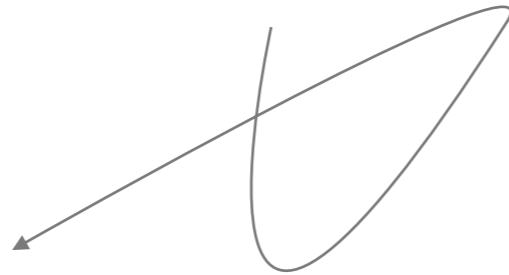
- Income, *Pizzo*, Punishment Cost, Damages (kept constant)
- Extorter Radius
- Neighbourhood Radius
- Number of Entrepreneurs
- Number of Extorters
 - Ratio of Mafiosi and Fakers



Individualist Decision Making

If . . .

(minimal) social influence



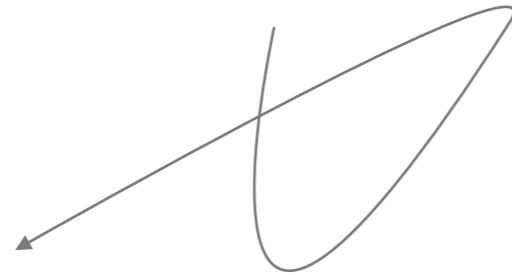
*punishment-probability * possible-damage < pizzo*

. . . refuse payment.

Individualist Decision Making

(minimal) social influence

If . . .



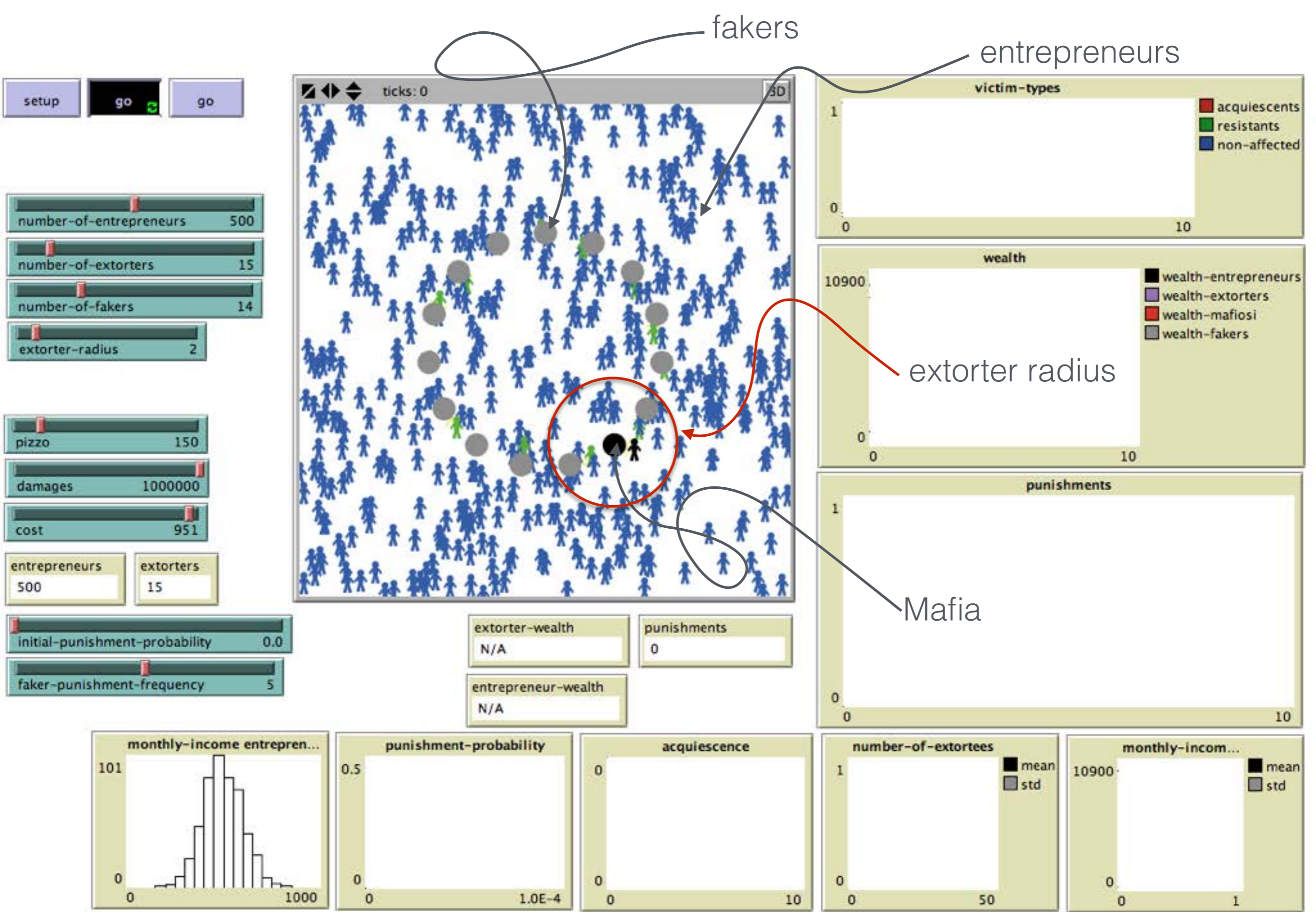
*punishment-probability * possible-damage < pizzo*



. . . refuse payment.

Analysis

- Two Scenarios
 - Pure Mafia over 1, 10 and 20 Extorters
 - Mafia and Fakers over 3:7, 5:5 and 7:3 Ratios
- Extorter and Neighbourhood Radius on
 - Punishments
 - Levels of Resistance



fakers

entrepreneurs

extorter radius

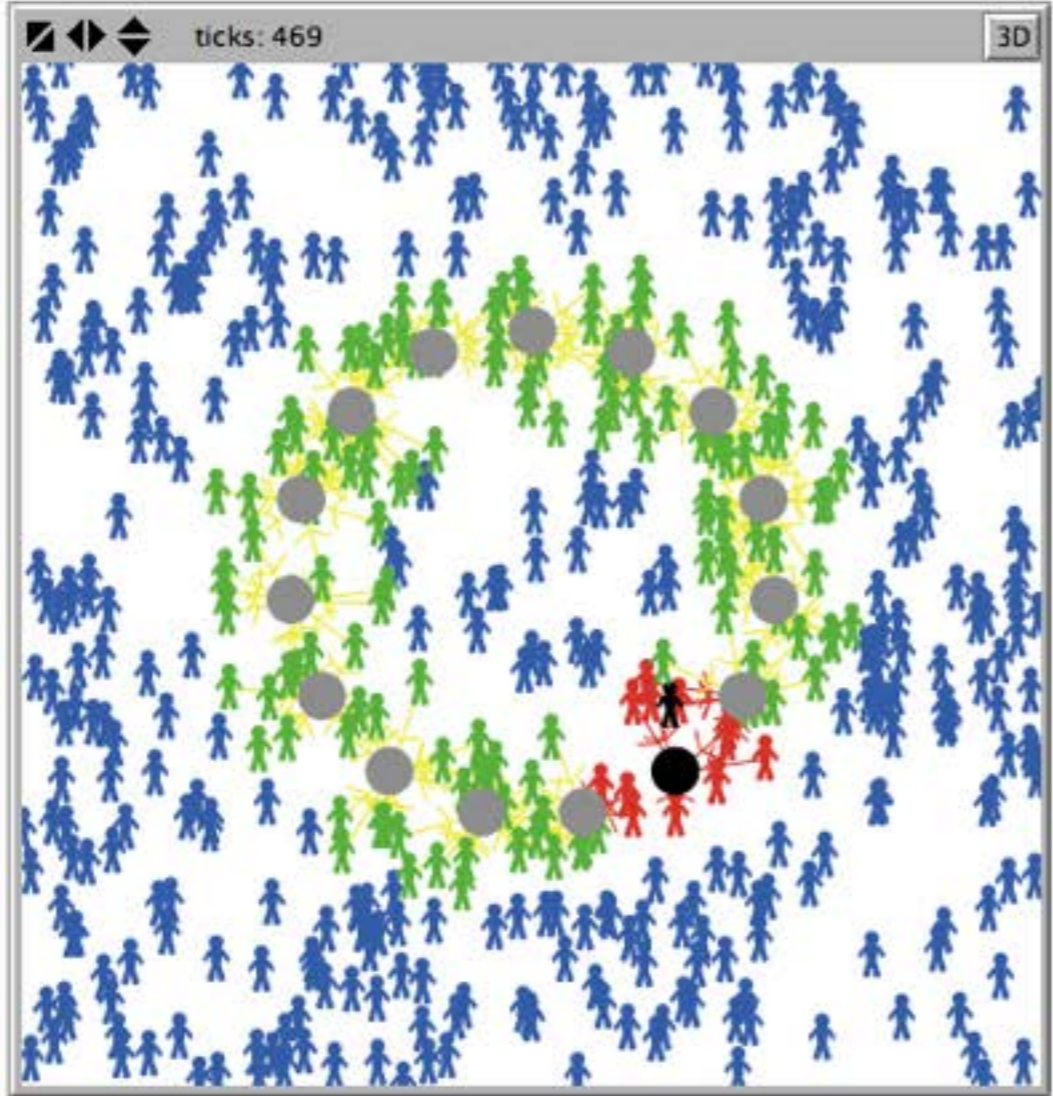
Mafia

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 number-of-extorters 15
 number-of-fakers 14
 extorter-radius 3

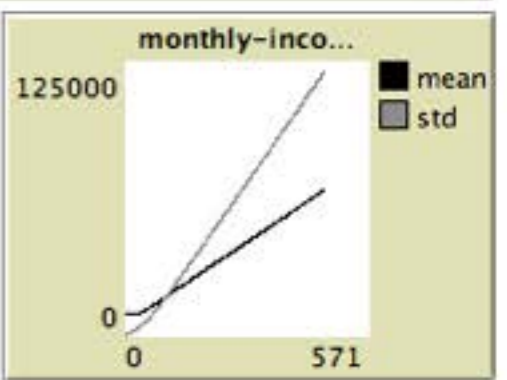
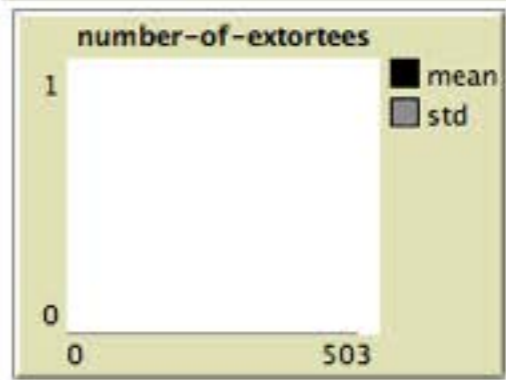
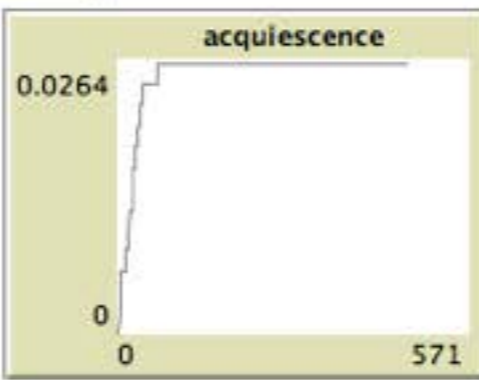
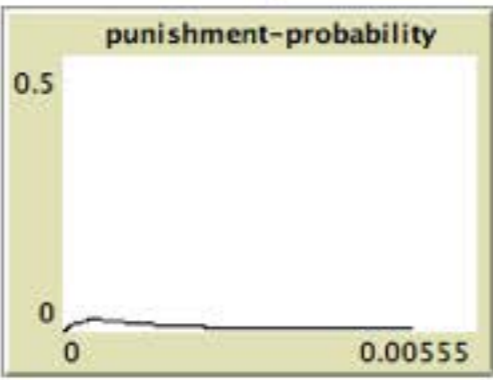
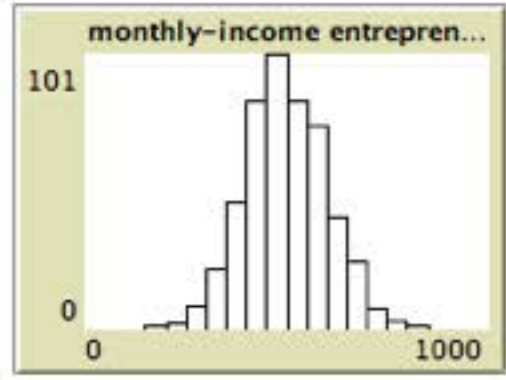
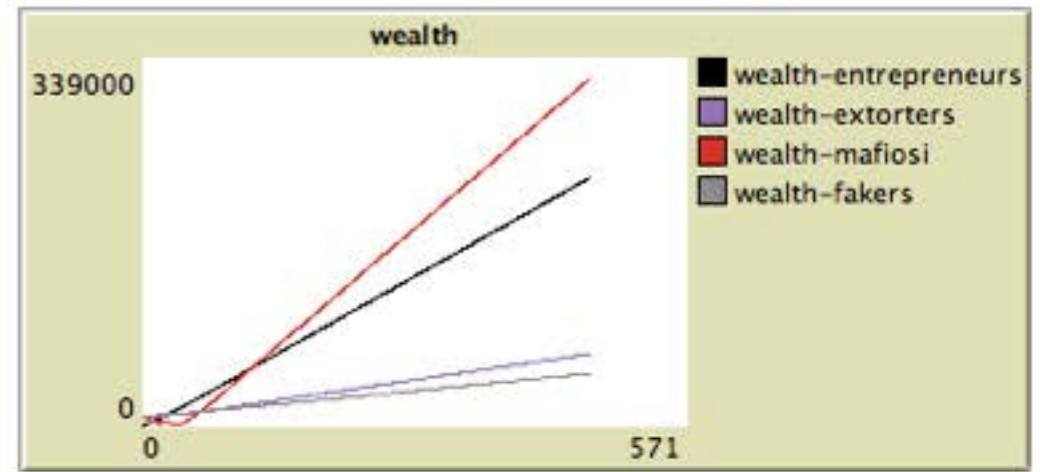
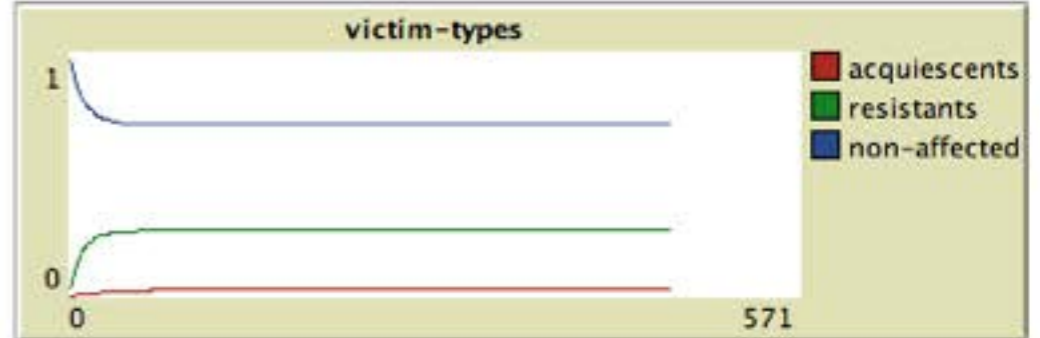
pizzo 150
 damages 1000000
 cost 951

entrepreneurs 500
 extorters 15

initial-punishment-probability 0.0
 faker-punishment-frequency 5



extorter-wealth 36297.67
 entrepreneur-wealth 113044.47
 punishments 33

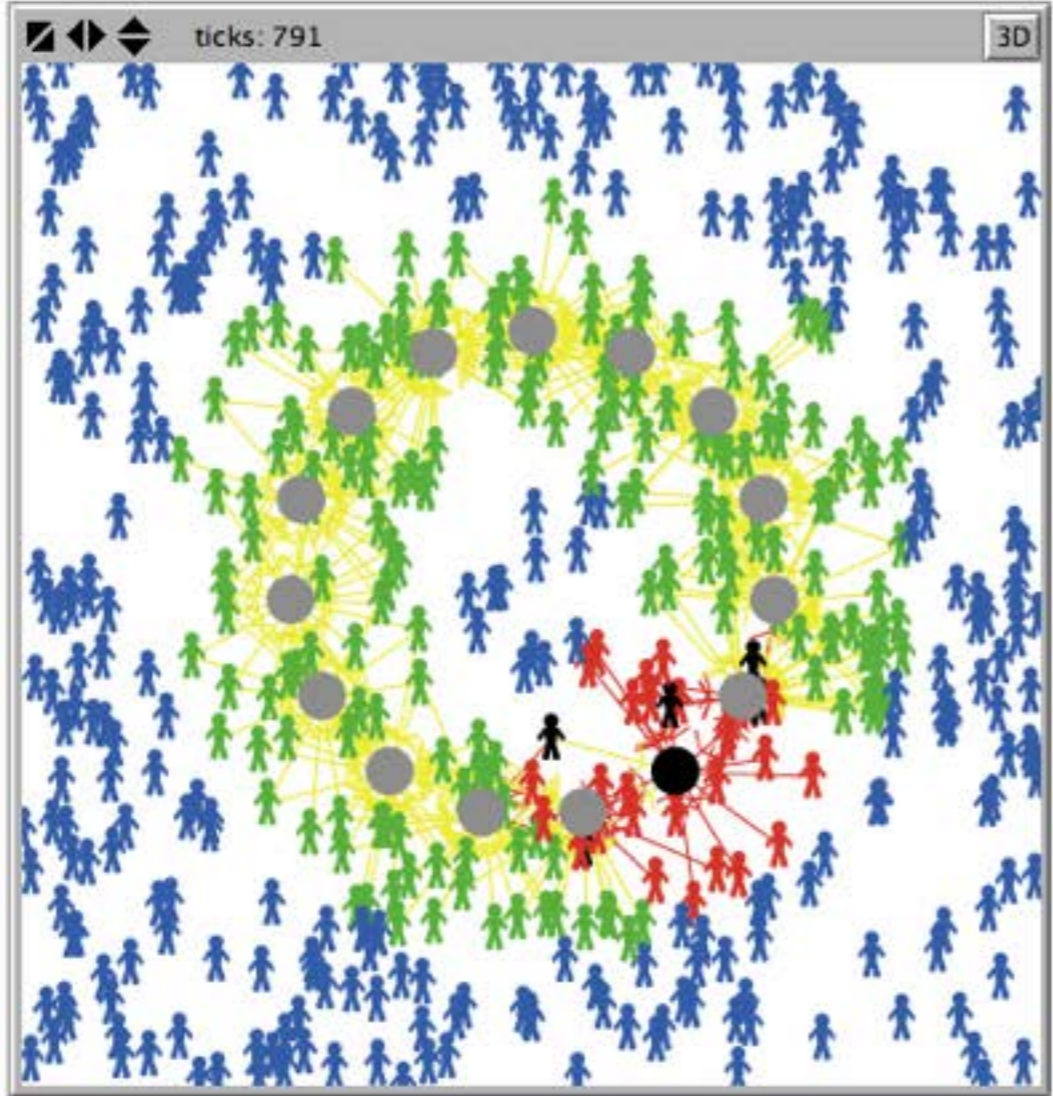


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 number-of-fakers 14
 extorter-radius 4

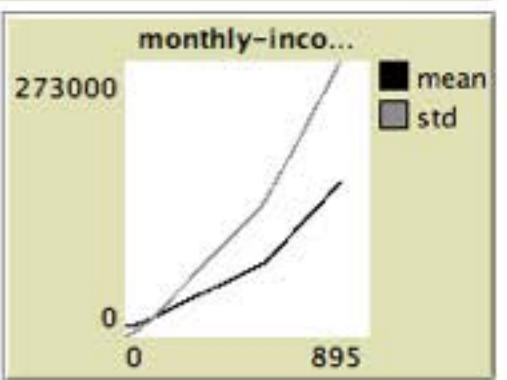
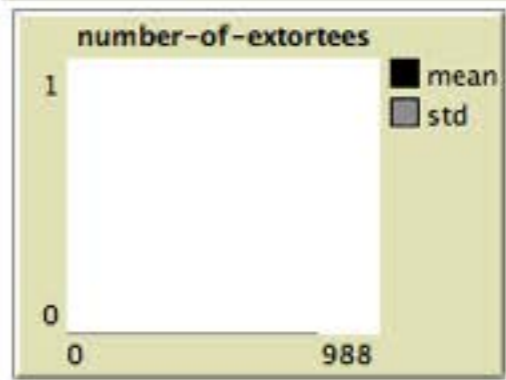
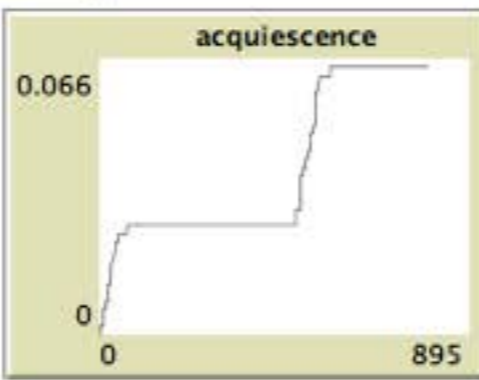
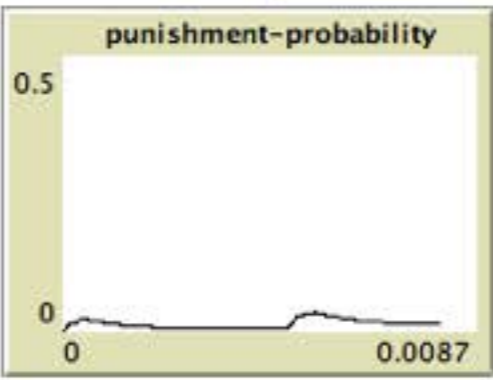
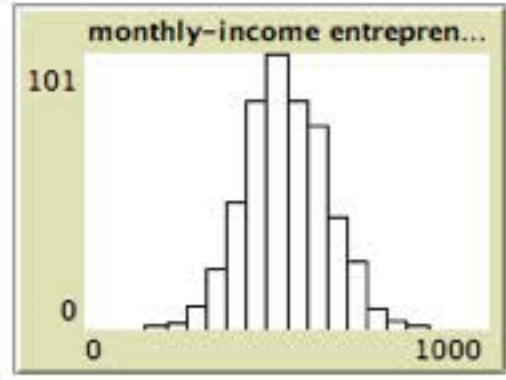
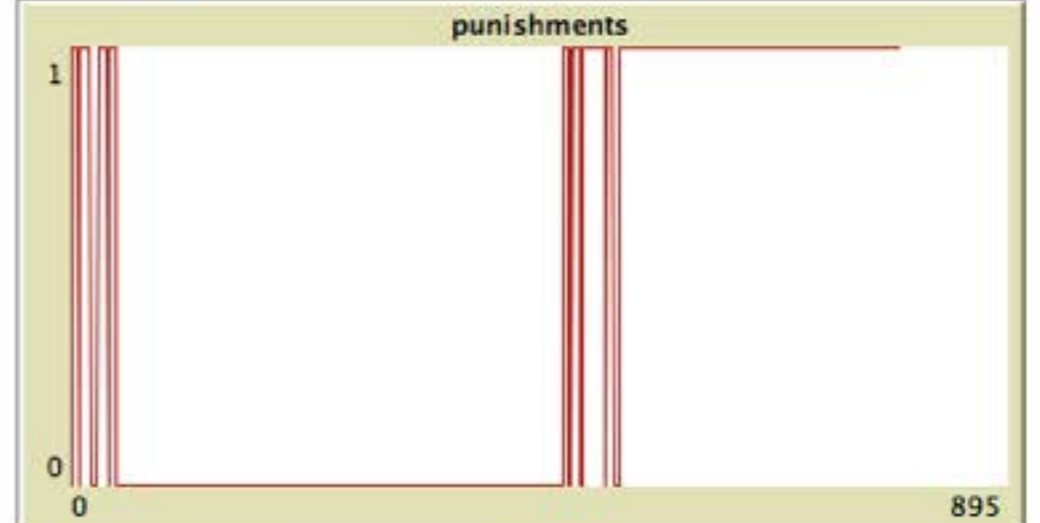
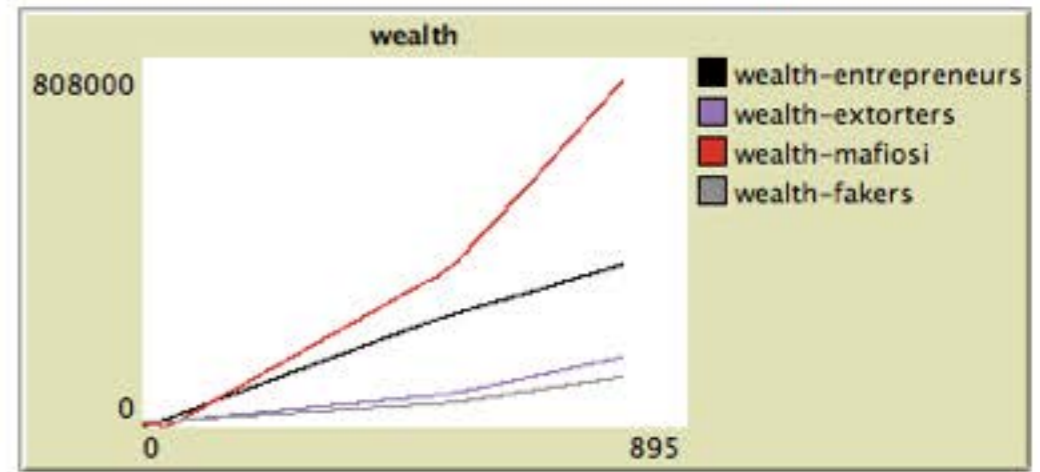
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 damages 1000000
 cost 951

entrepreneurs 500
 extorters 15

initial-punishment-probability 0.0
 faker-punishment-frequency 5



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 entrepreneur-wealth 186002.07
 punishments 342

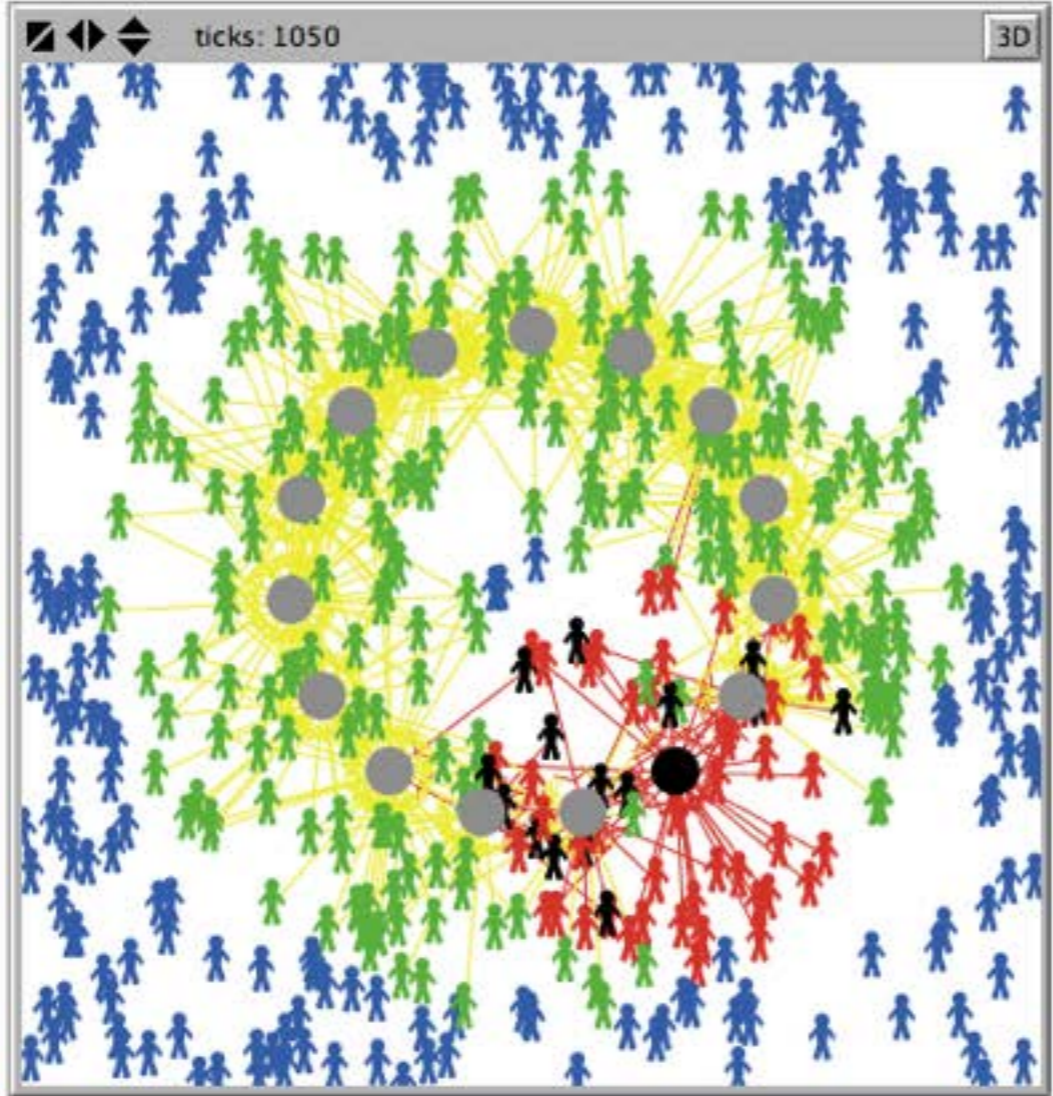


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 number-of-extorters 15
 number-of-fakers 14
 extorter-radius 5

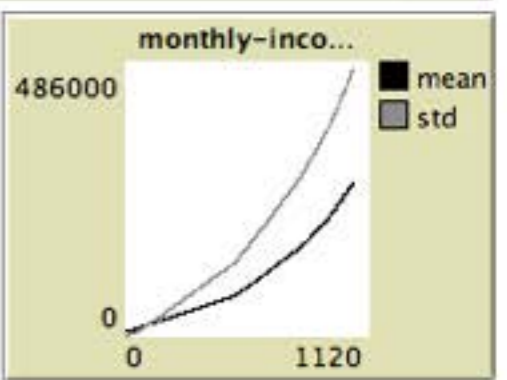
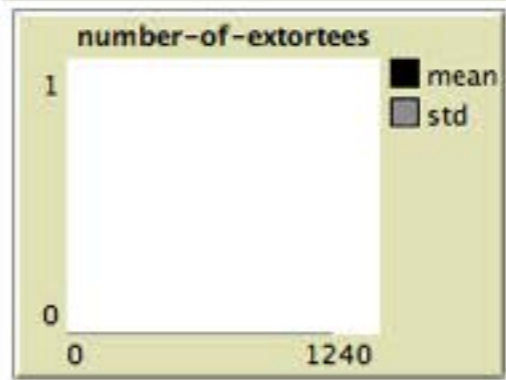
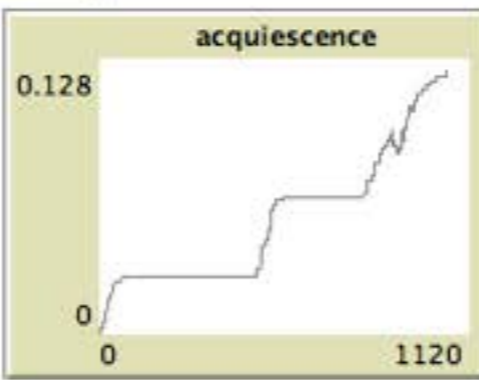
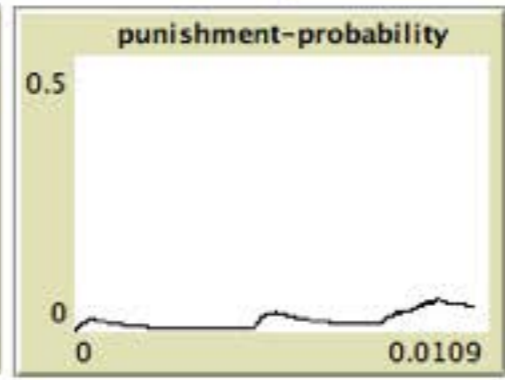
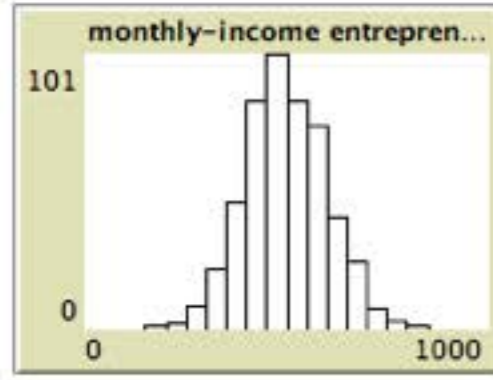
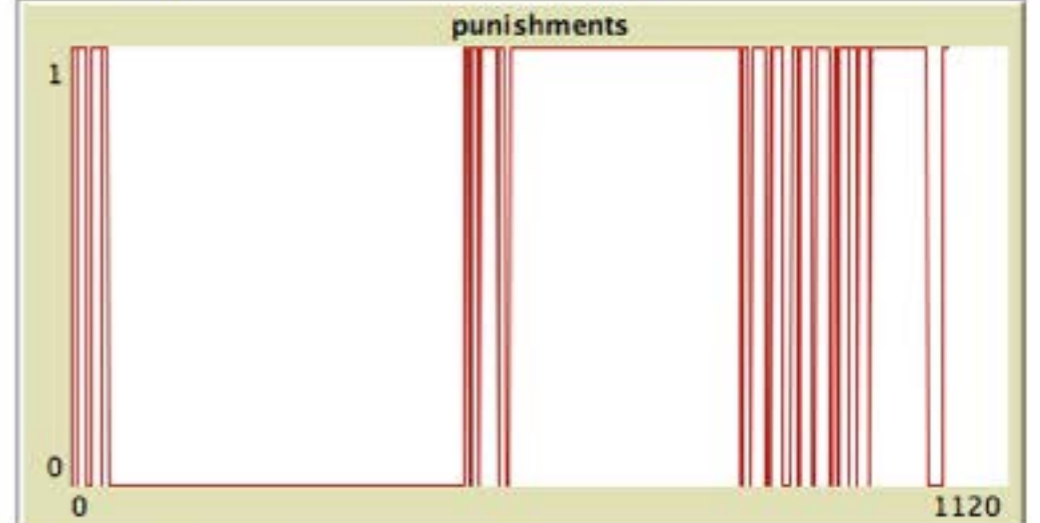
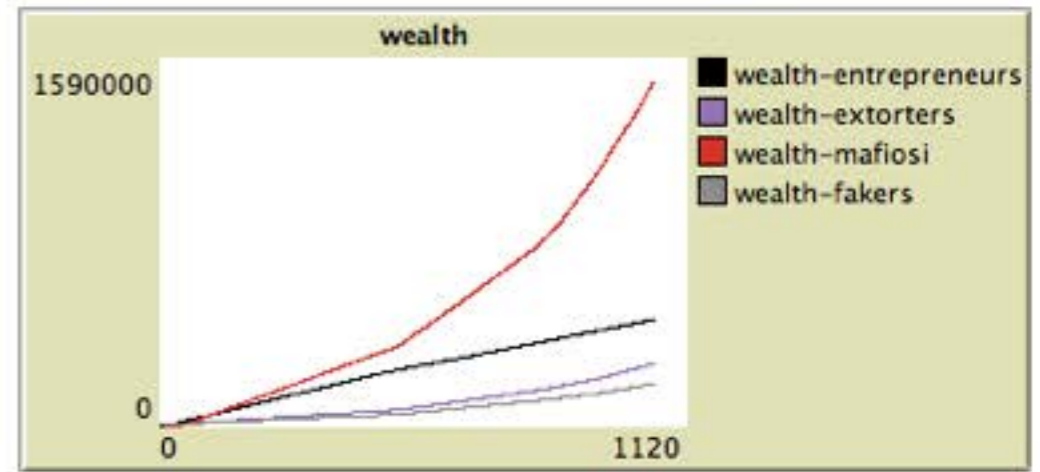
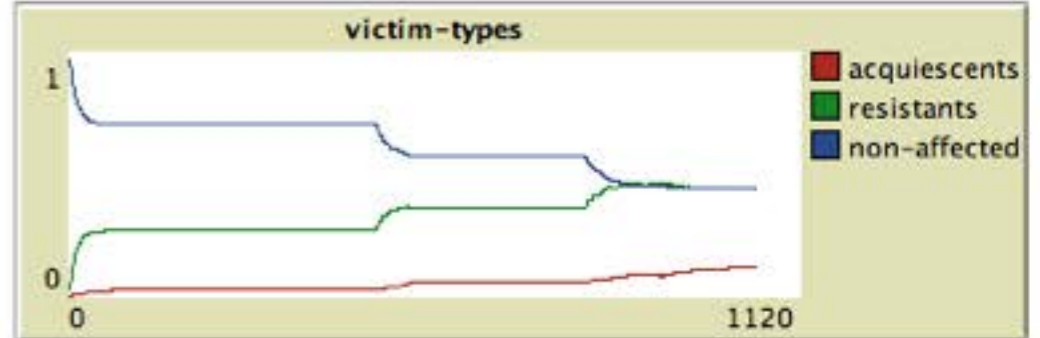
pizzo 150
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 cost 951

entrepreneurs 500
 extorters 15

initial-punishment-probability 0.0
 faker-punishment-frequency 5



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 entrepreneur-wealth 240924.05
 punishments 542

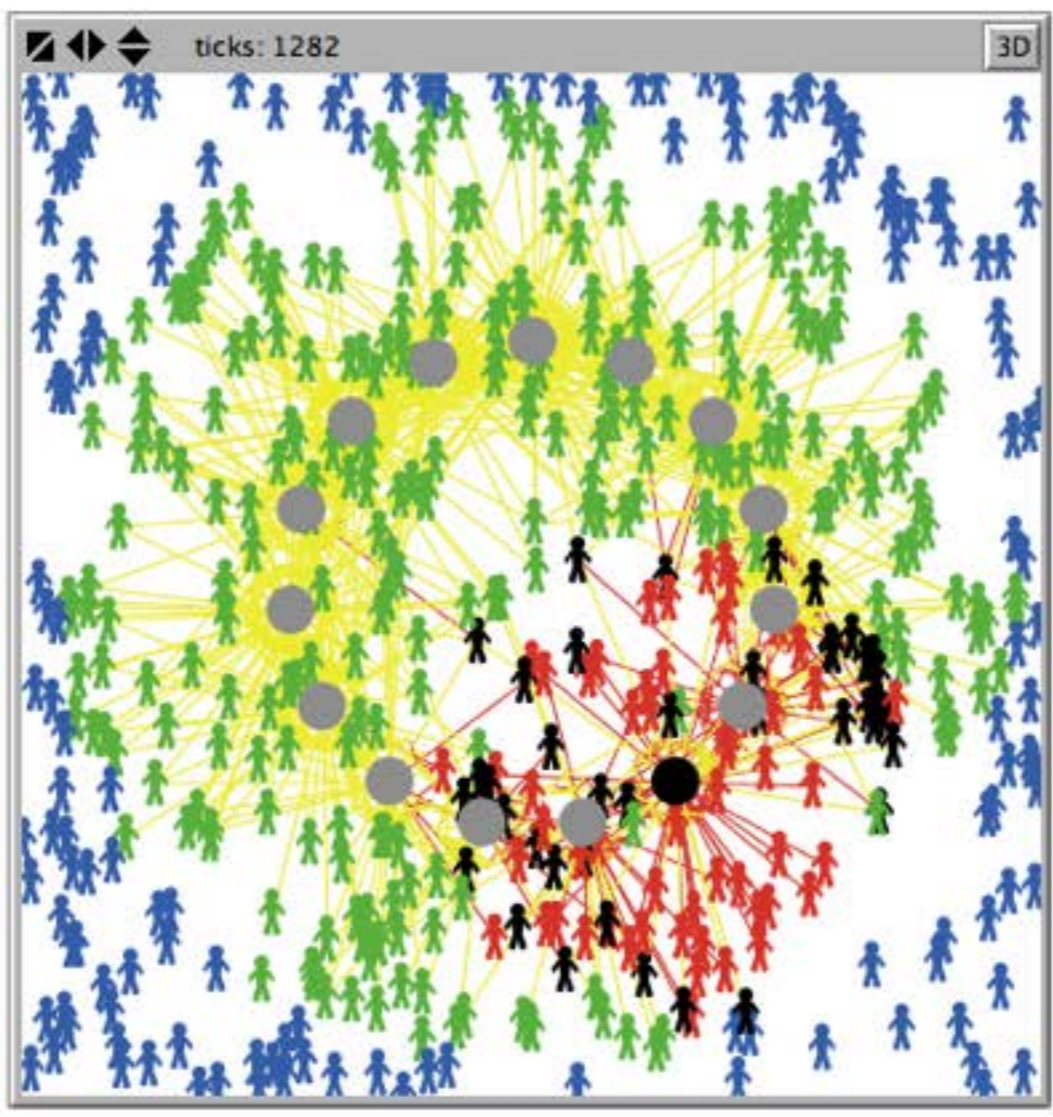


number-of-entrepreneurs 500
 number-of-extorters 15
 number-of-fakers 14
 extorter-radius 6

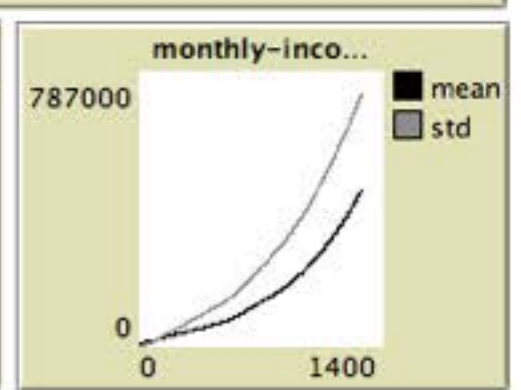
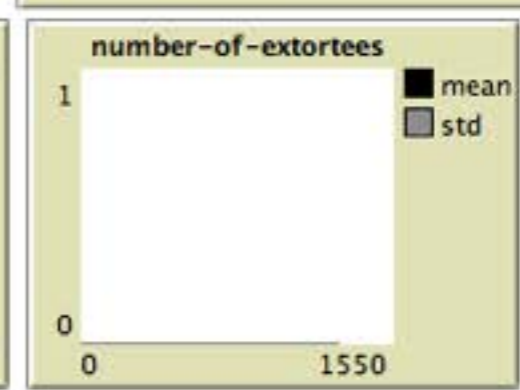
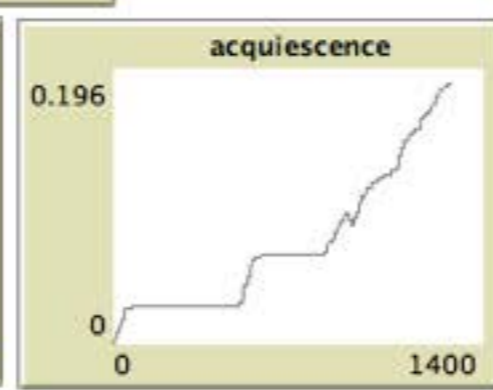
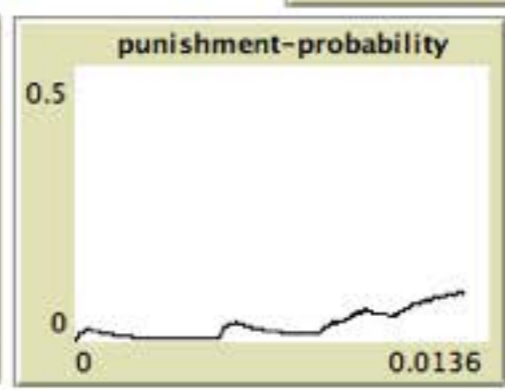
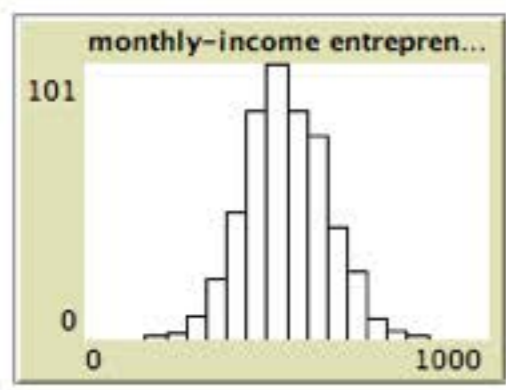
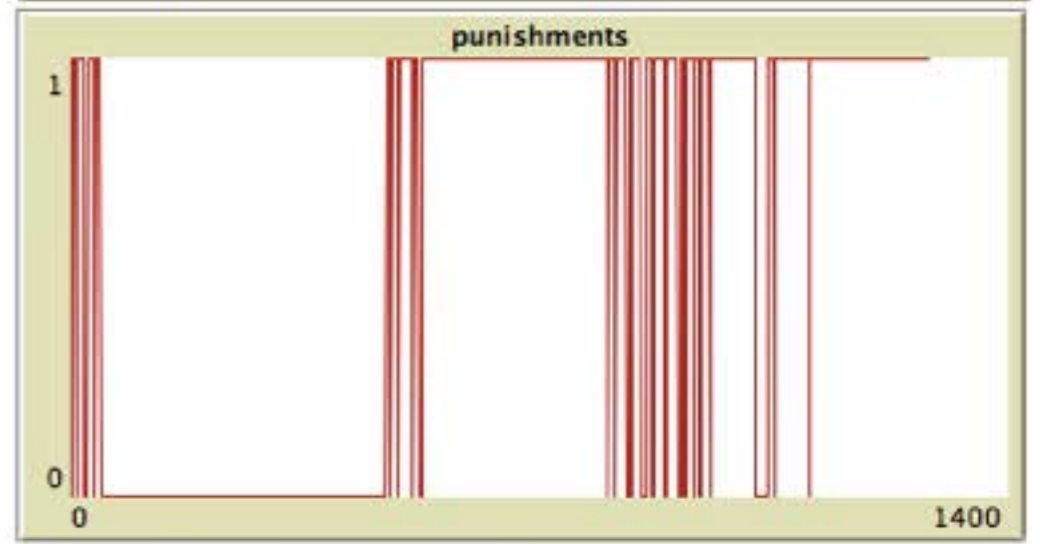
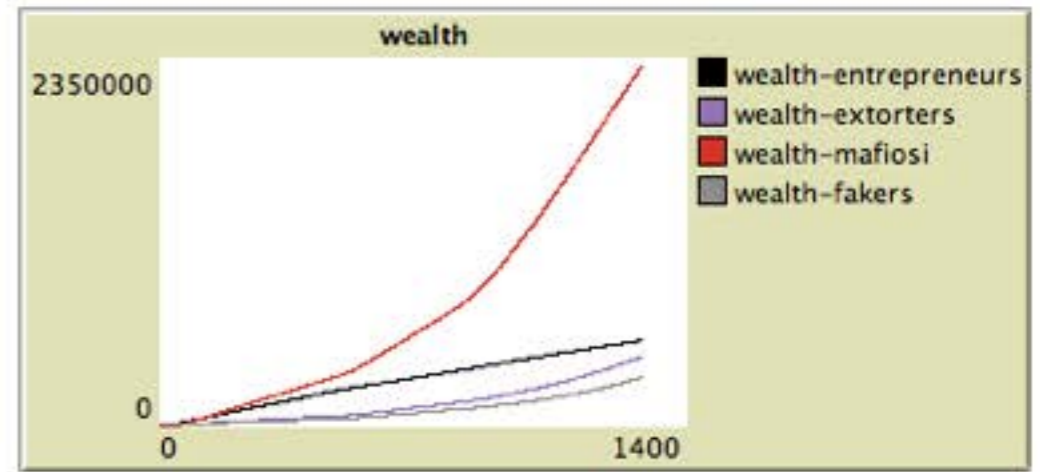
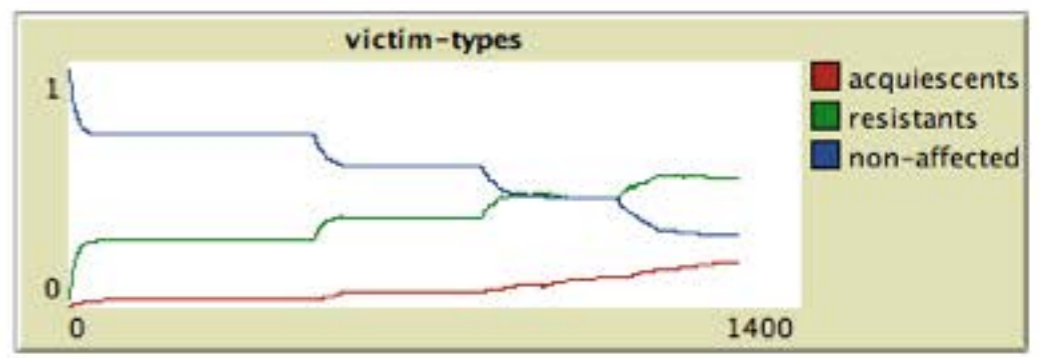
pizzo 150
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 cost 951

entrepreneurs 500
 extorters 15

initial-punishment-probability 0.0
 faker-punishment-frequency 5



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 entrepreneur-wealth 288784.42
 punishments 772

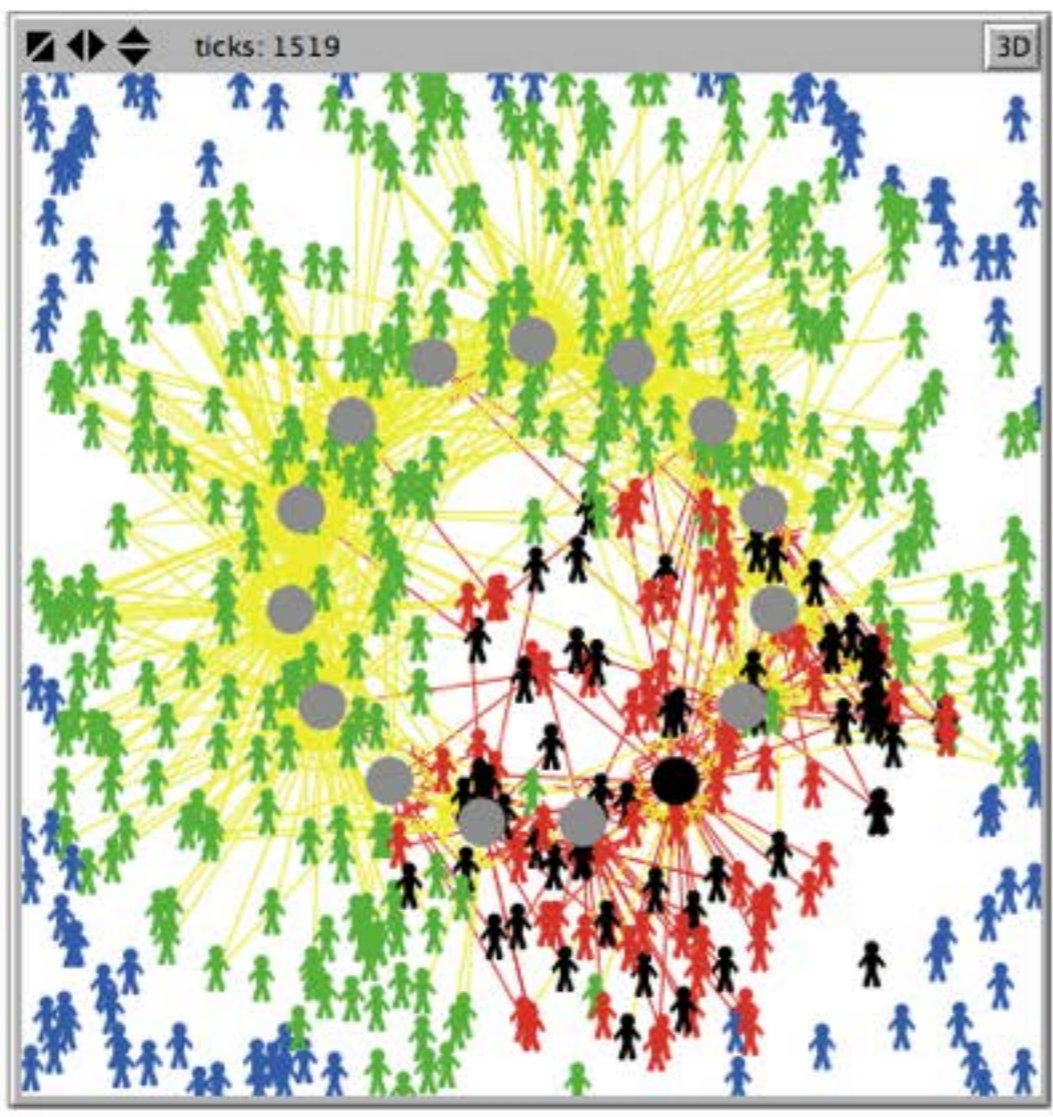


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 number-of-fakers 14
 extorter-radius 7

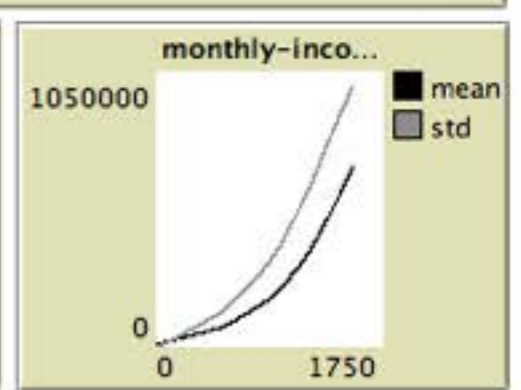
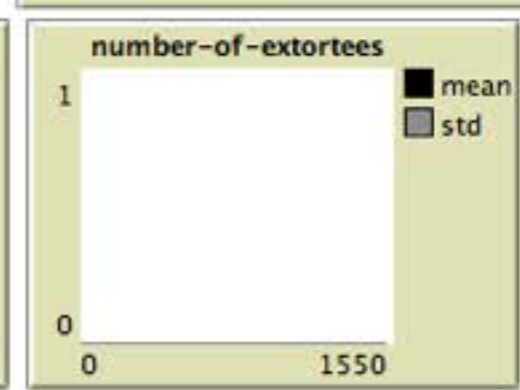
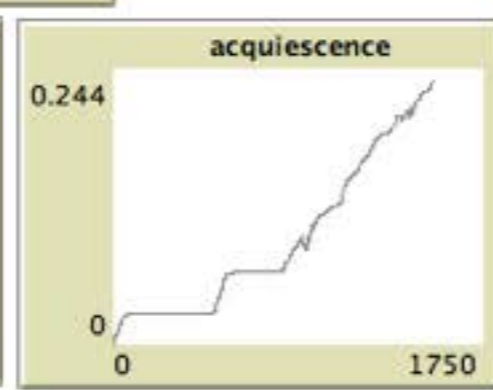
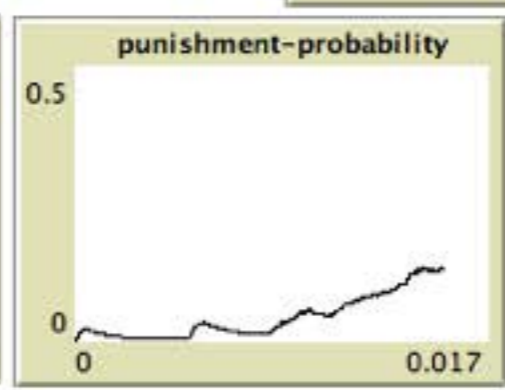
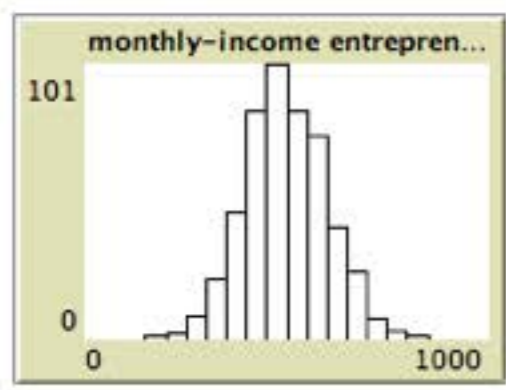
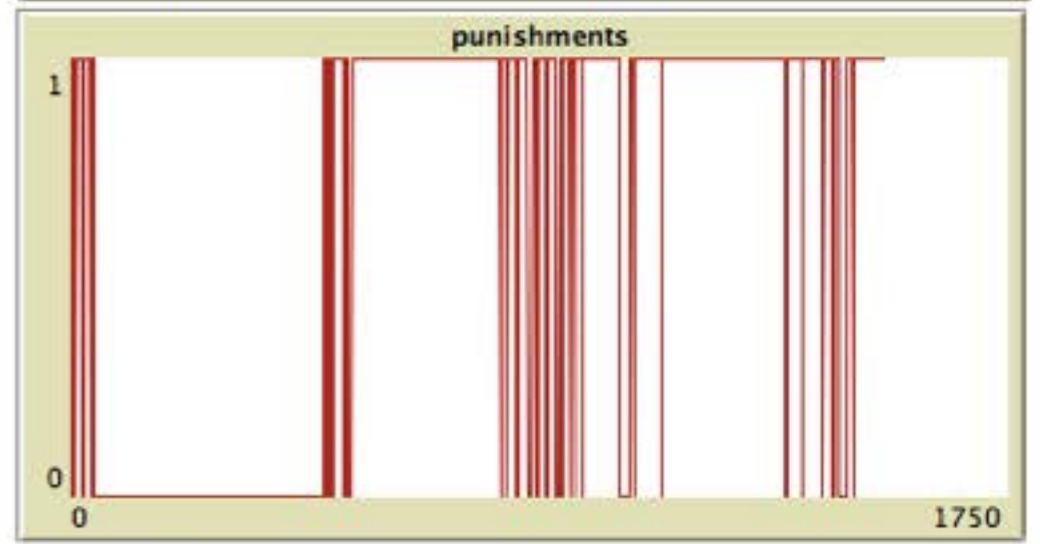
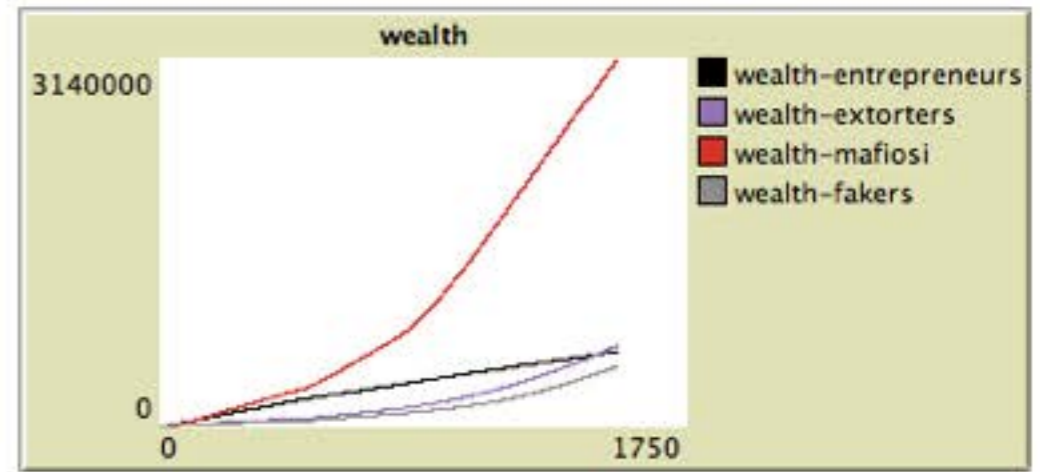
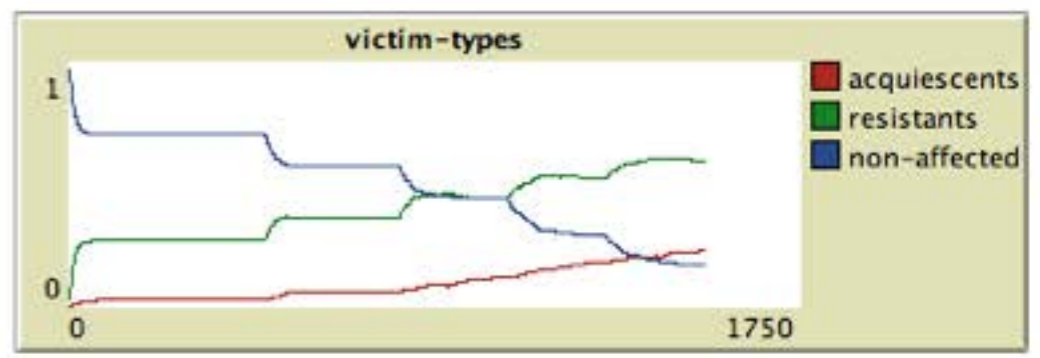
pizzo 150
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 cost 951

entrepreneurs 500
 extorters 15

initial-punishment-probability 0.0
 faker-punishment-frequency 5



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 entrepreneur-wealth 336412.72
 punishments 981

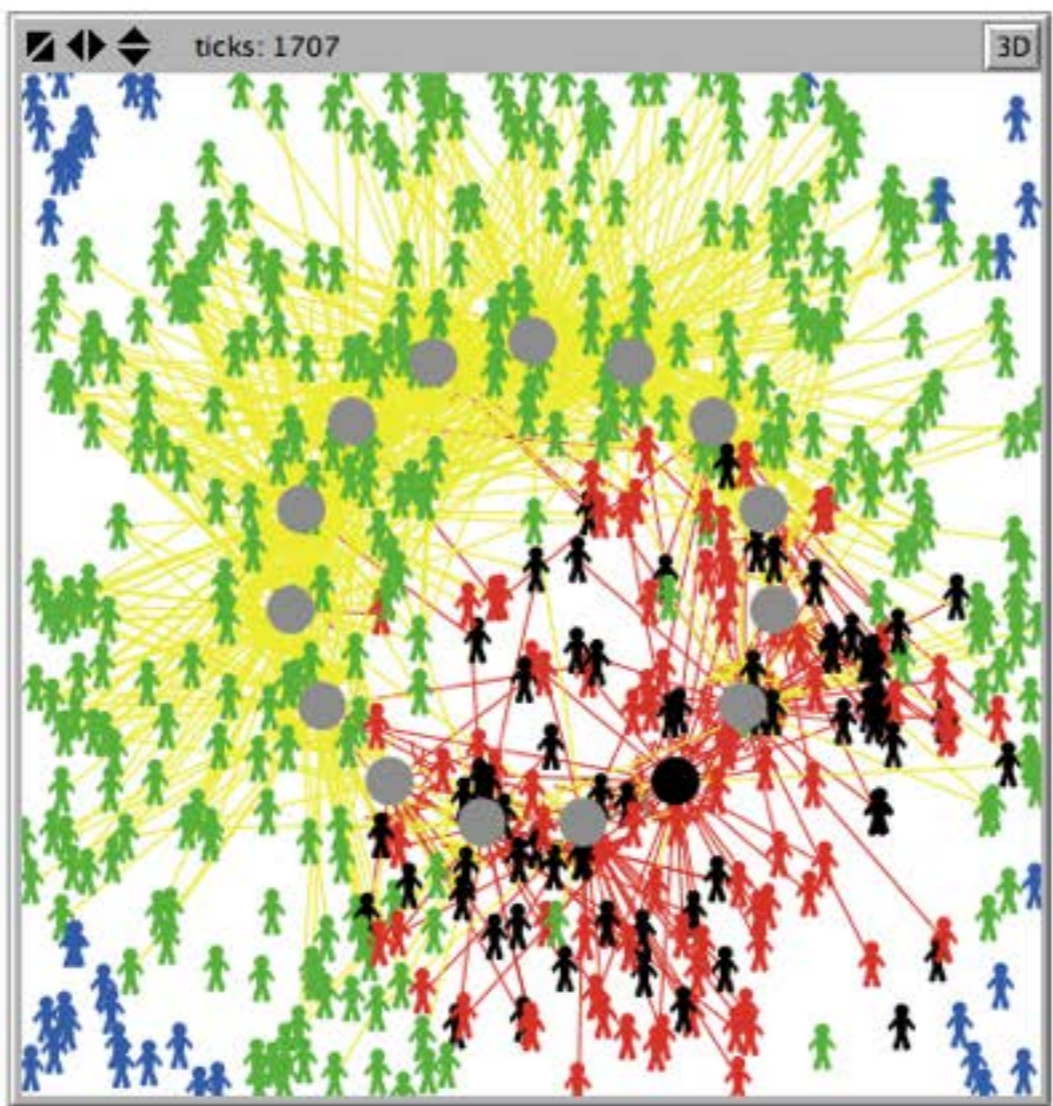


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 number-of-fakers 14
 extorter-radius 8

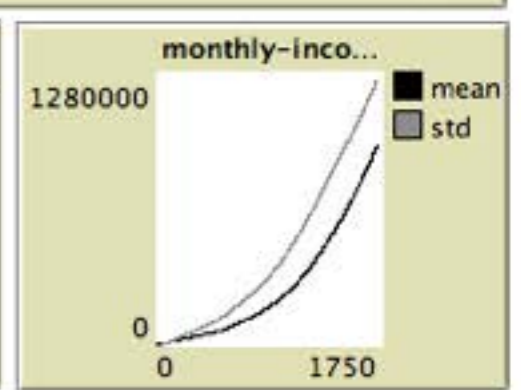
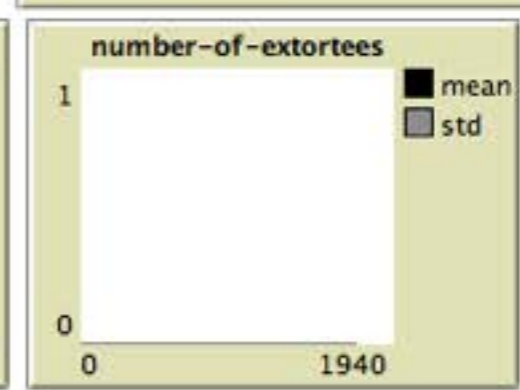
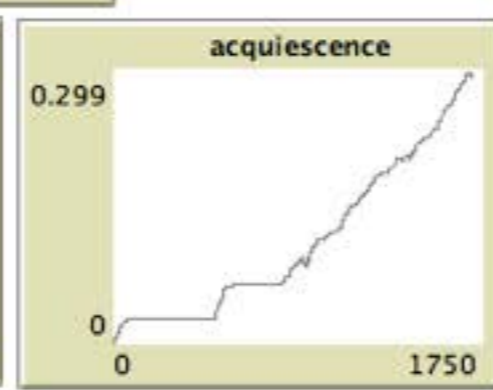
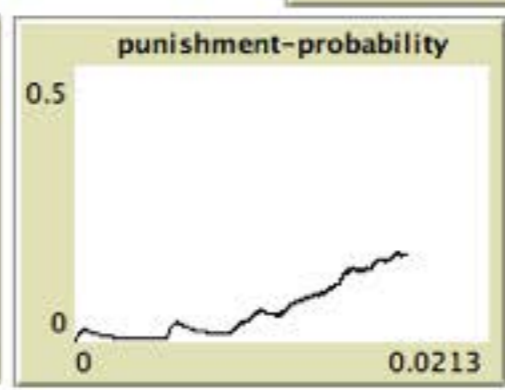
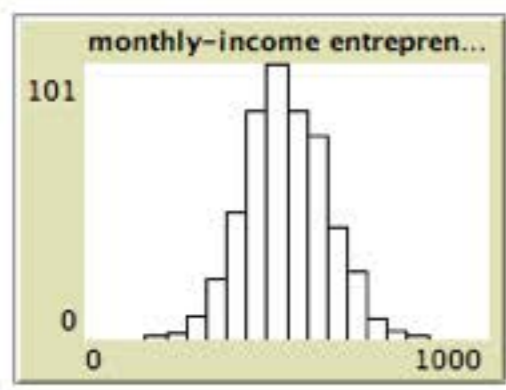
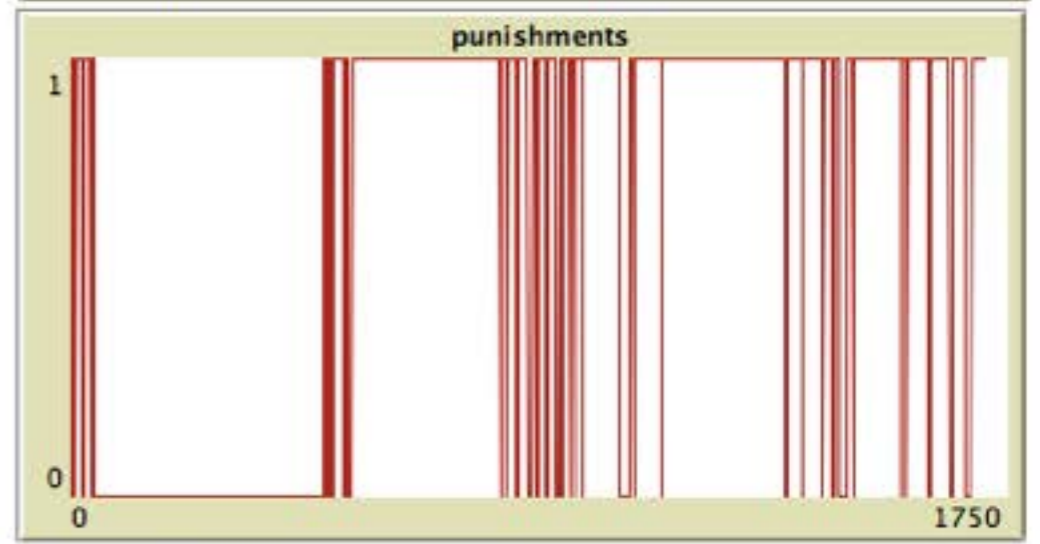
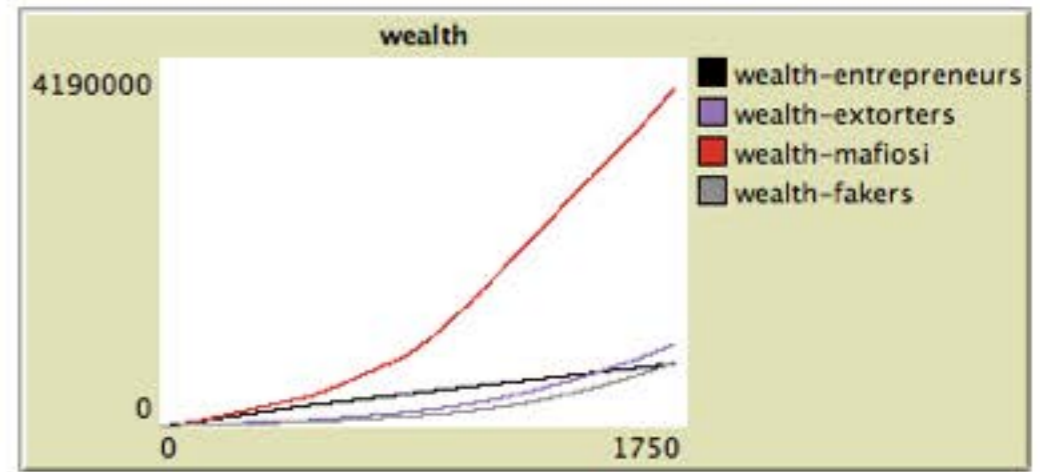
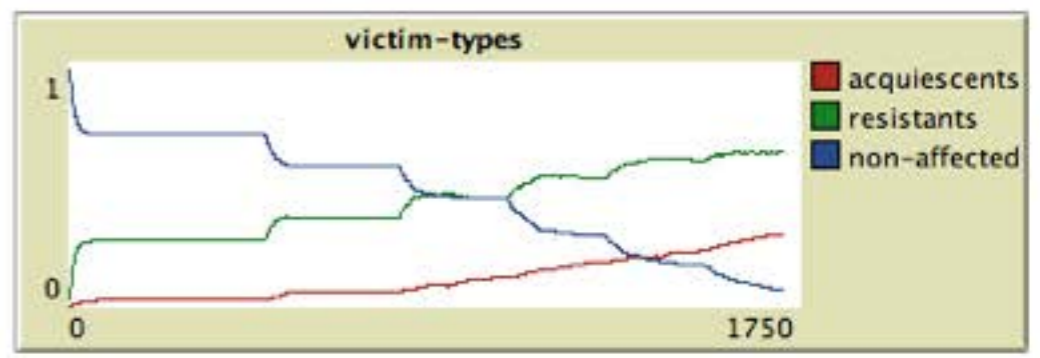
pizzo 150
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 cost 951

entrepreneurs 500
 extorters 15

initial-punishment-probability 0.0
 faker-punishment-frequency 5



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 entrepreneur-wealth 373619.6
 punishments 1146

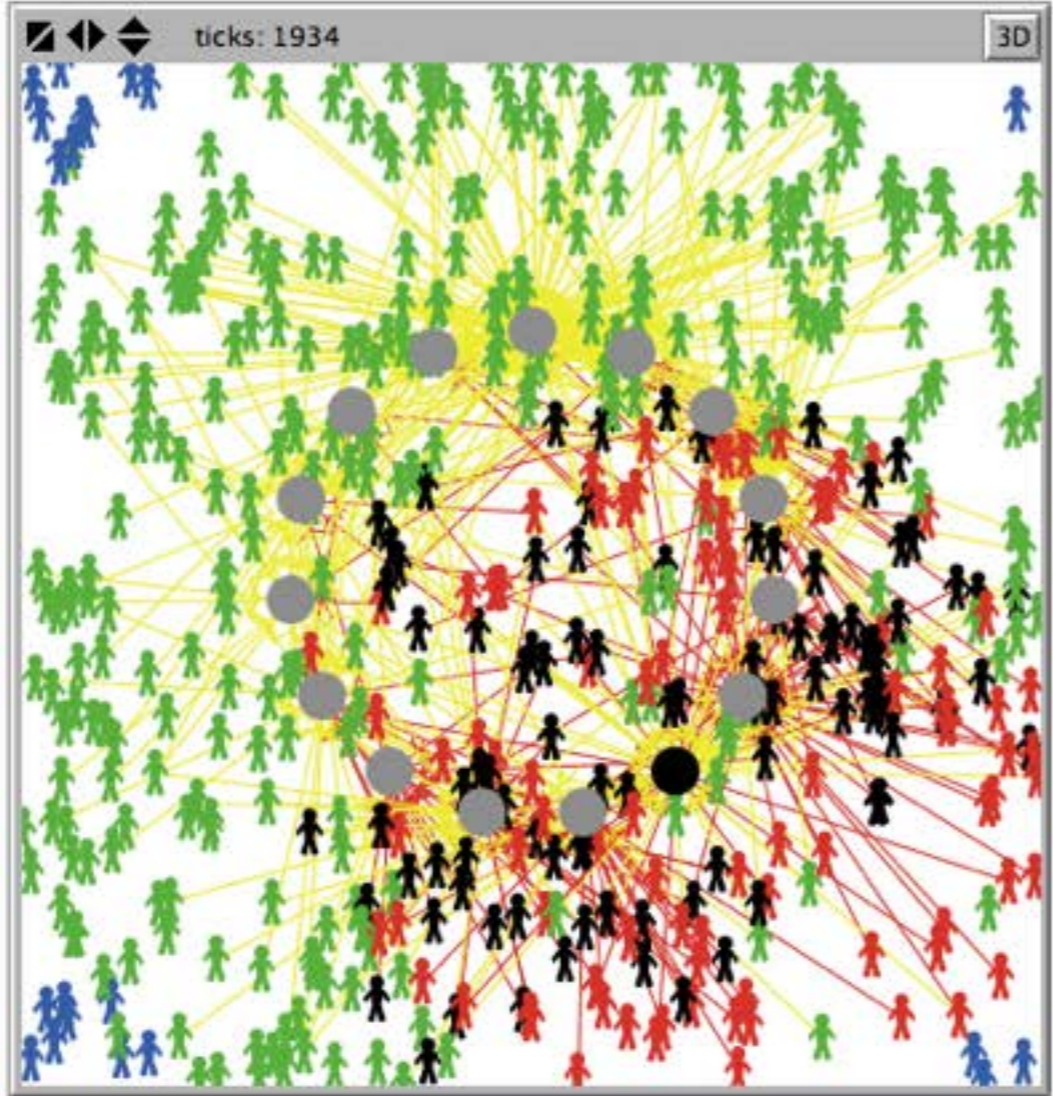


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 extorter-radius 9

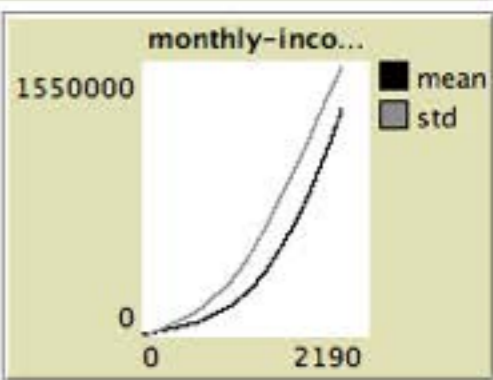
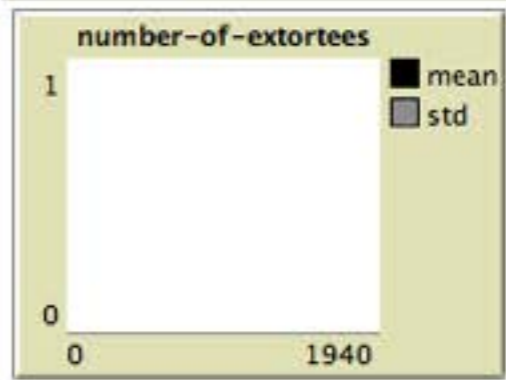
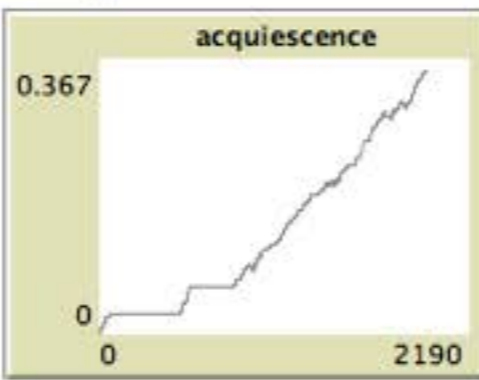
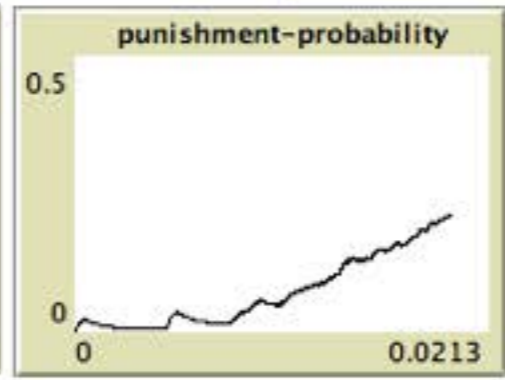
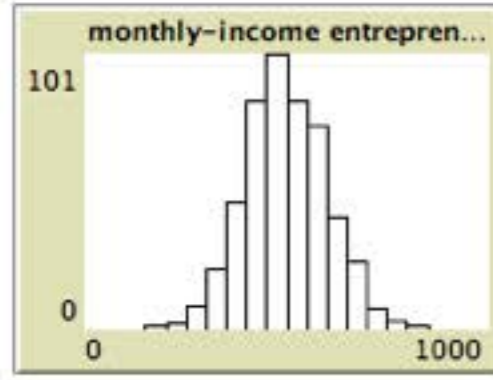
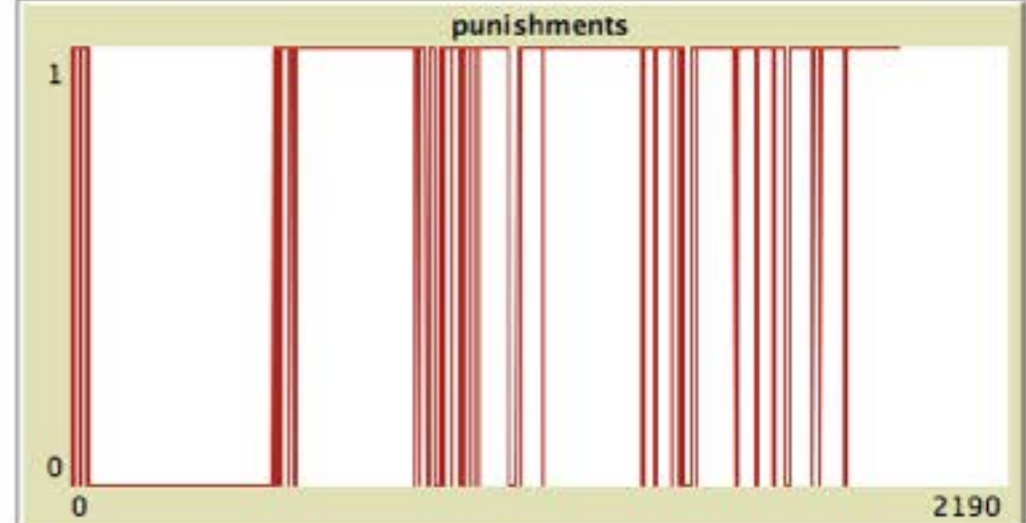
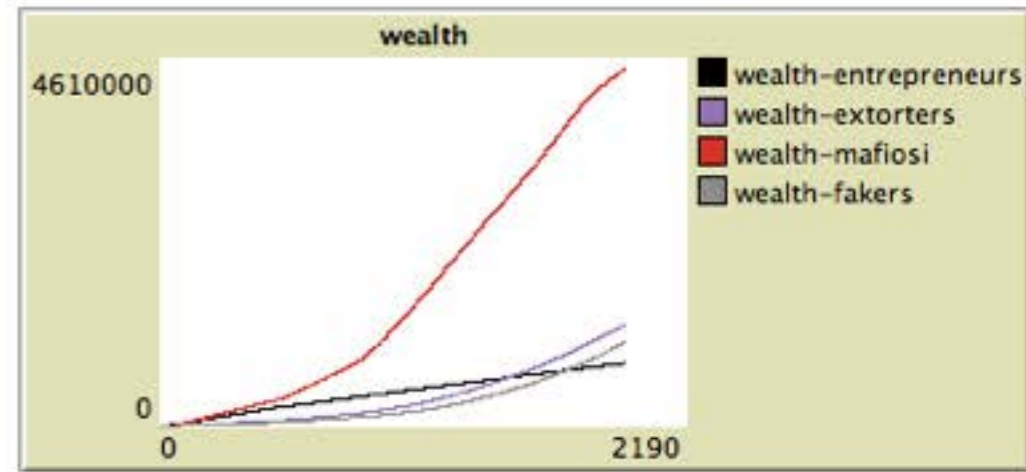
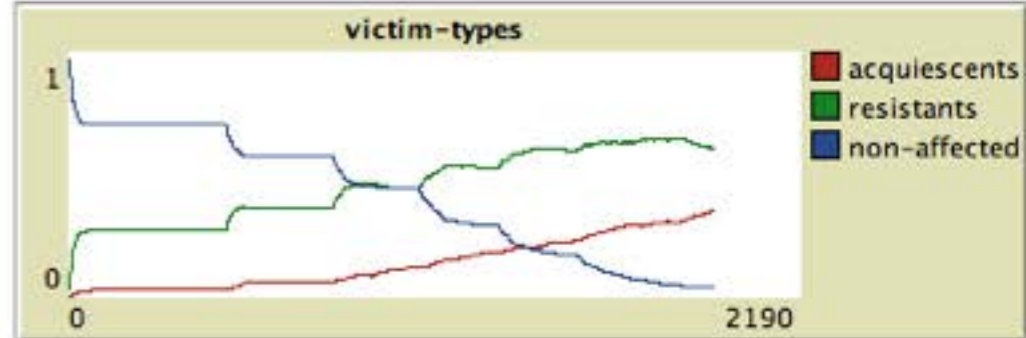
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 cost 951

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 extorters 15

initial-punishment-probability 0.0
 faker-punishment-frequency 5



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 punishments 1367

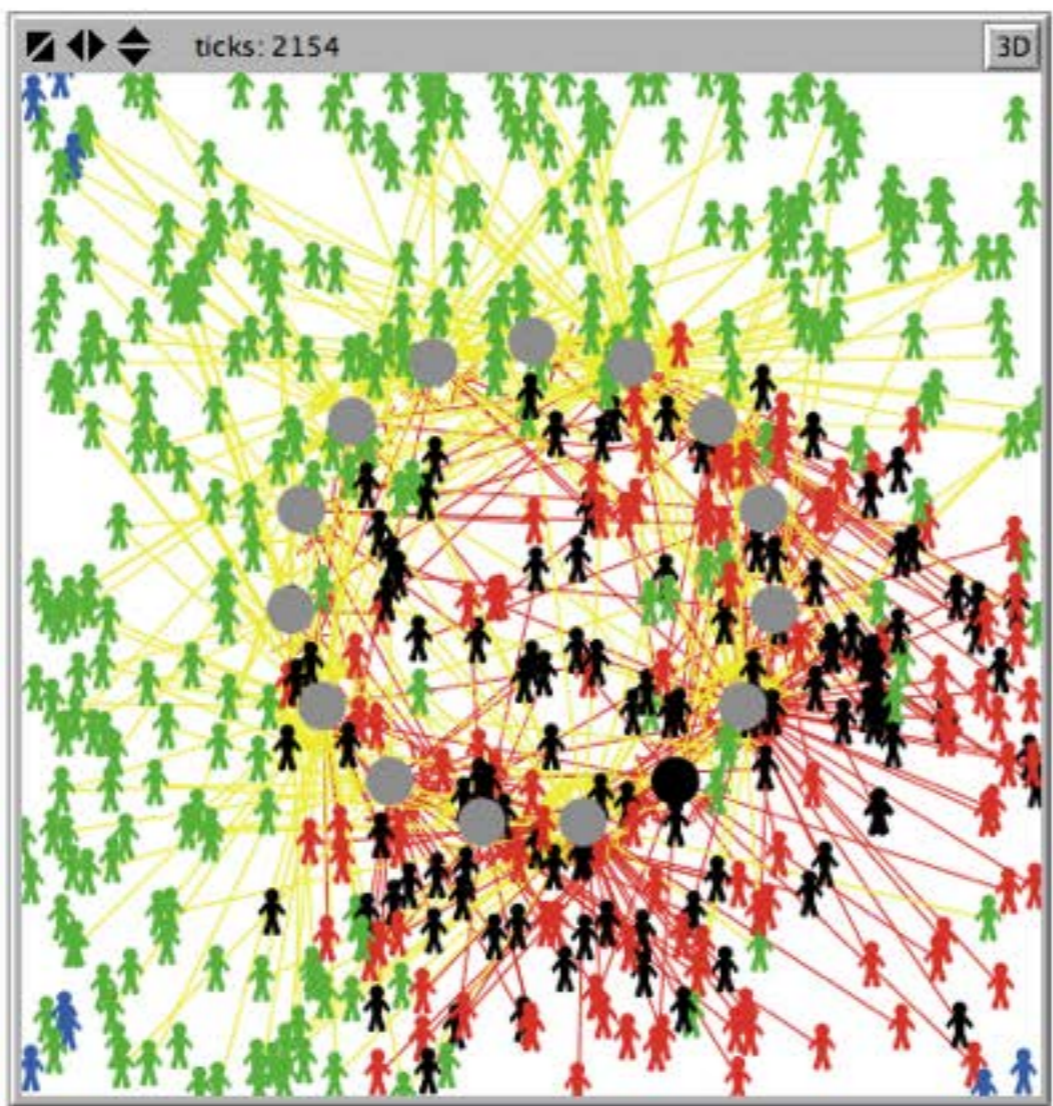


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 number-of-fakers 14
 extorter-radius 10

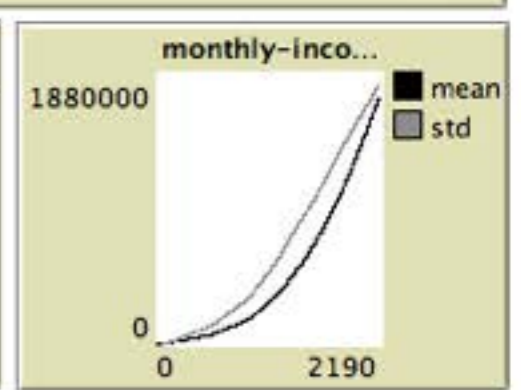
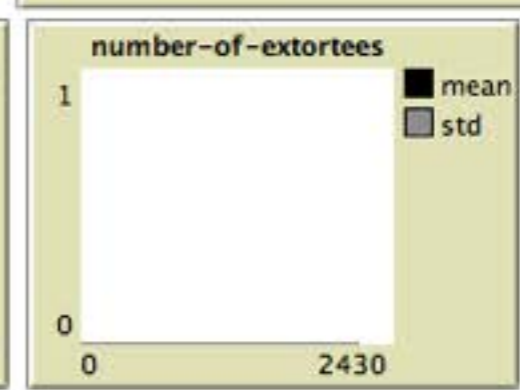
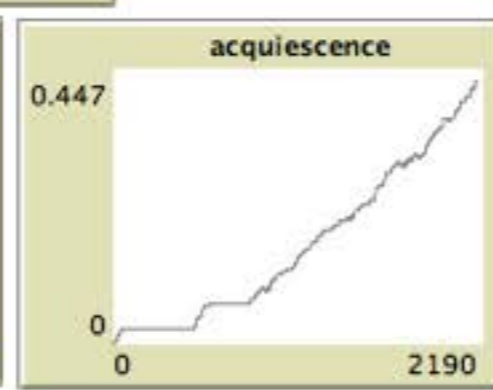
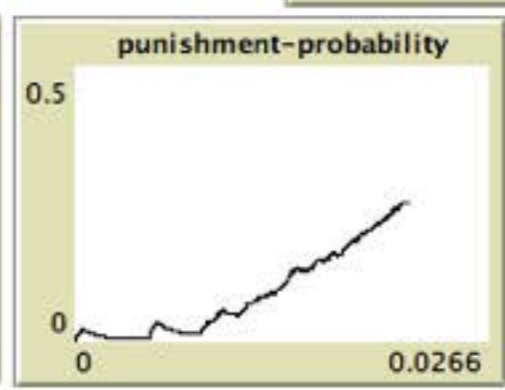
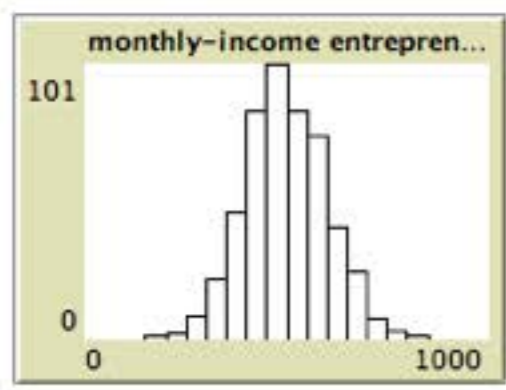
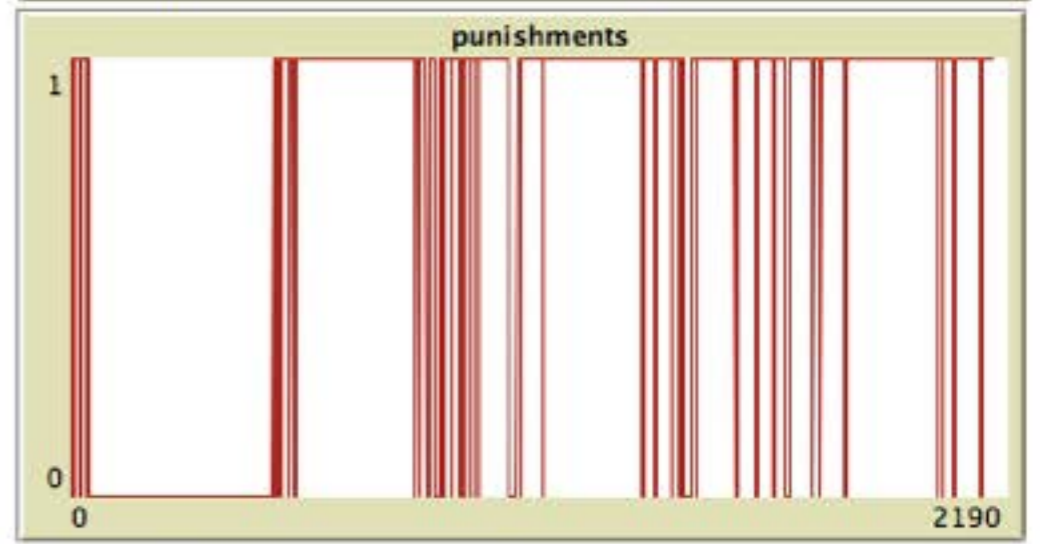
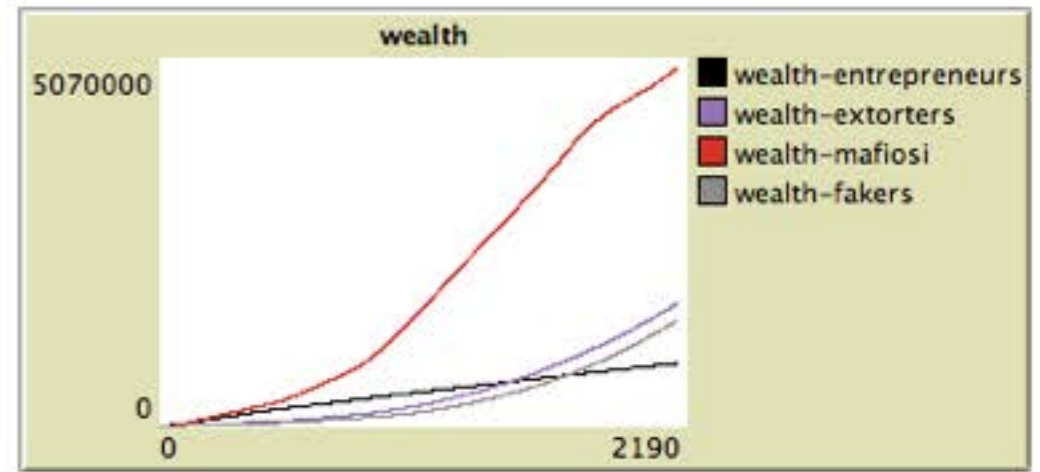
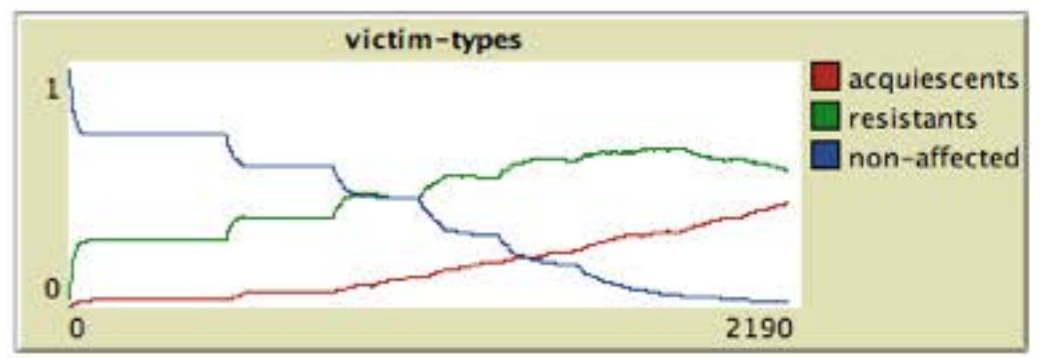
pizzo 150
 damages 1000000
 cost 951

entrepreneurs 500
 extorters 15

initial-punishment-probability 0.0
 faker-punishment-frequency 5



extorter-wealth 485761.94
 entrepreneur-wealth 459887.99
 punishments 1569

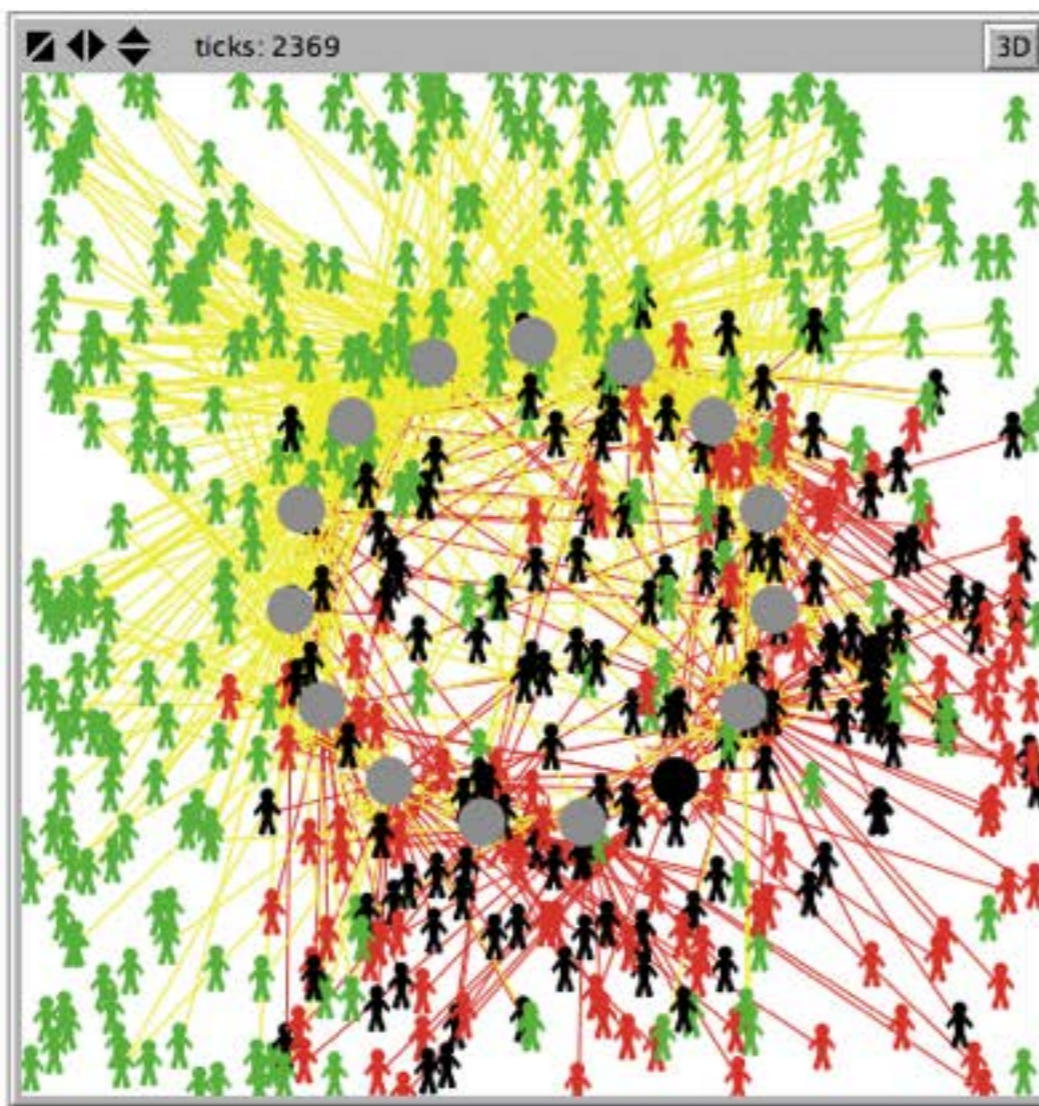


number-of-entrepreneurs 500
 number-of-extorters 15
 number-of-fakers 14
 extorter-radius 12

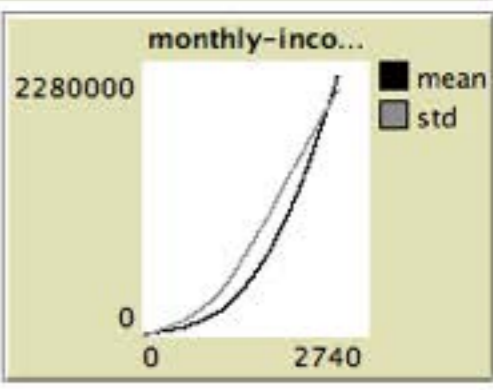
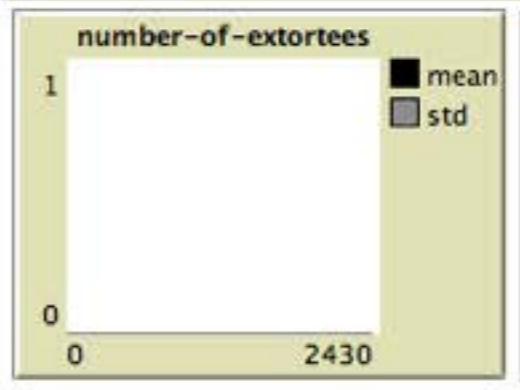
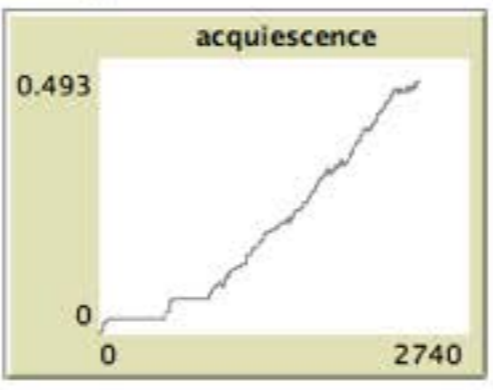
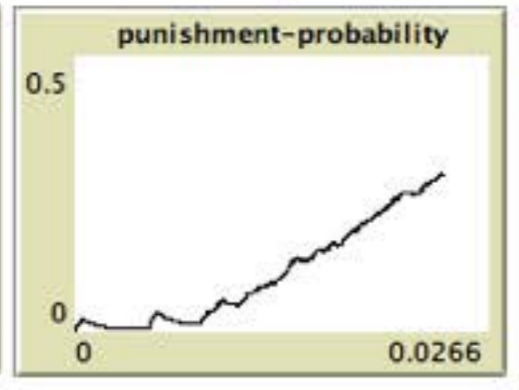
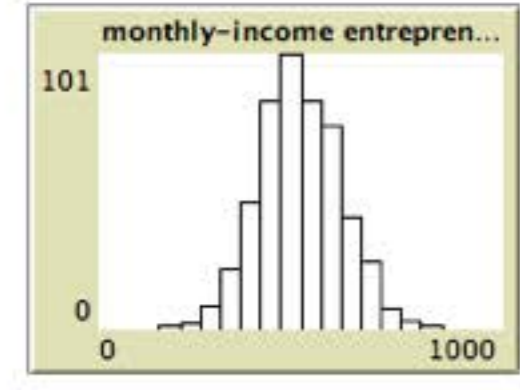
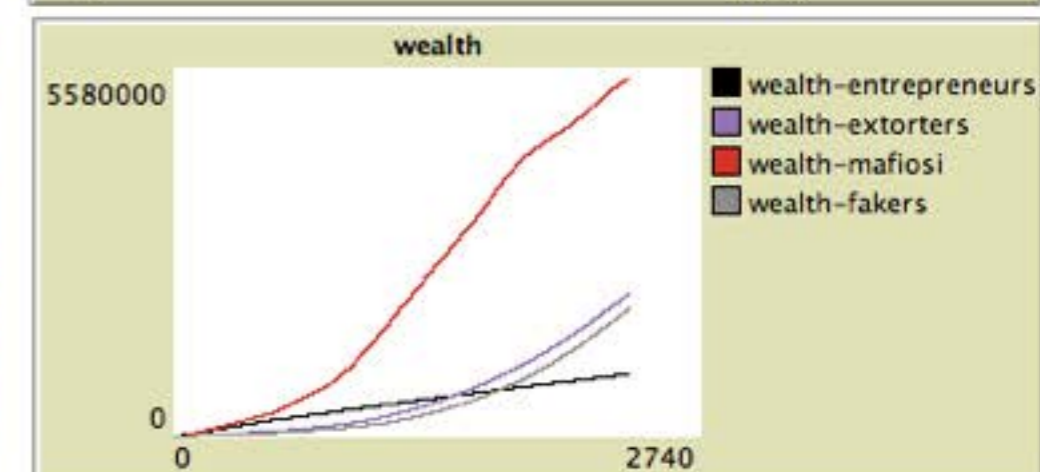
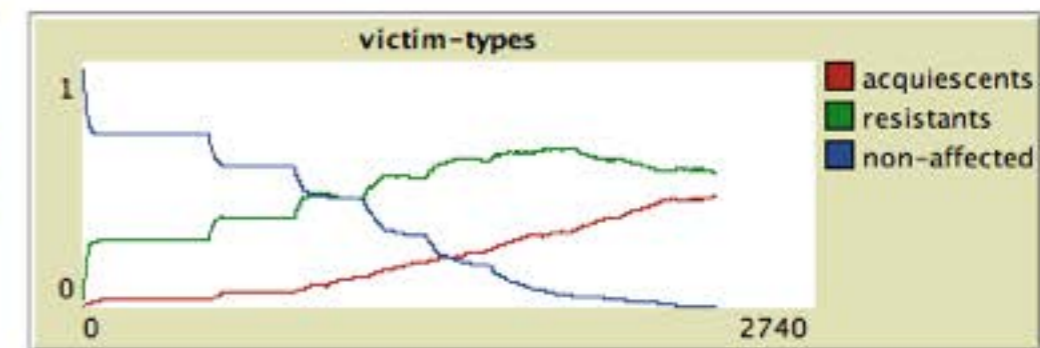
pizzo 150
 damages 1000000
 cost 951

entrepreneurs 500
 extorters 15

initial-punishment-probability 0.0
 faker-punishment-frequency 5



extorter-wealth 617662.04
 entrepreneur-wealth 500701.3
 punishments 1763



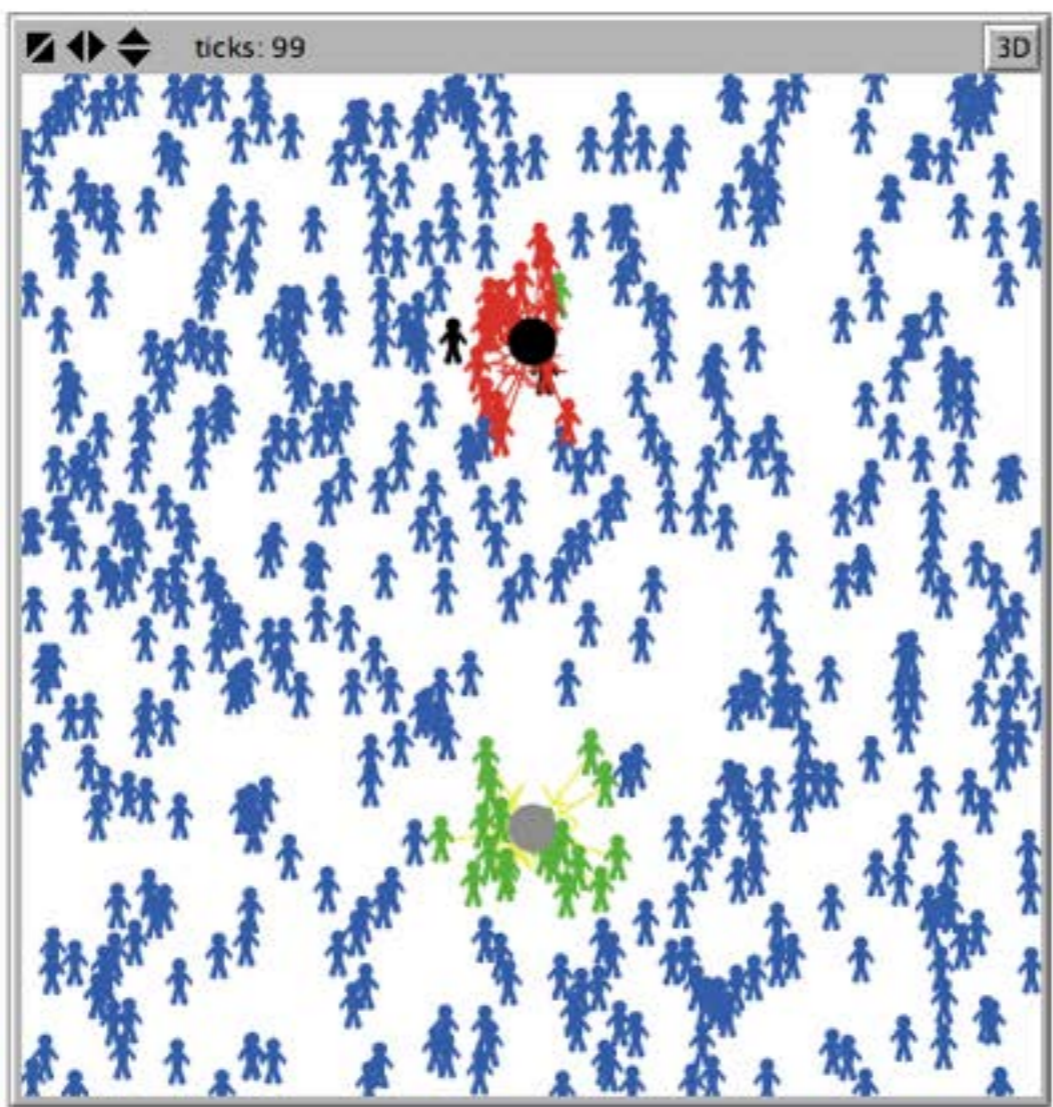
In Detail . . .

number-of-entrepreneurs 500
 number-of-extorters 2
 number-of-fakers 1
 extorter-radius 2

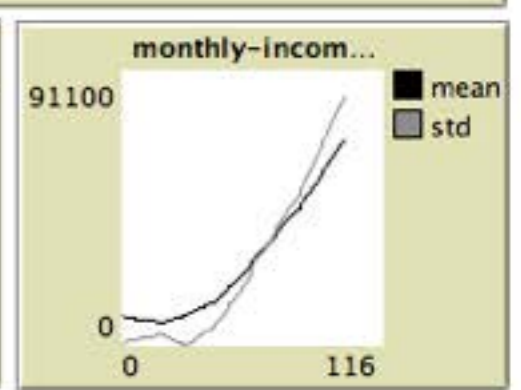
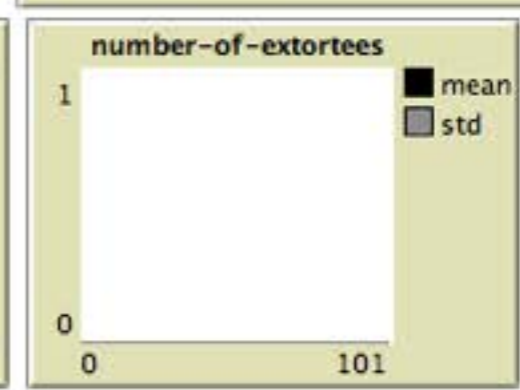
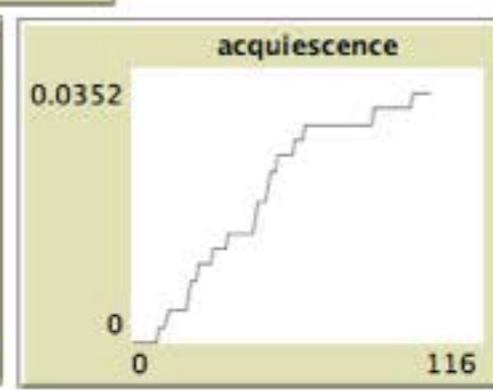
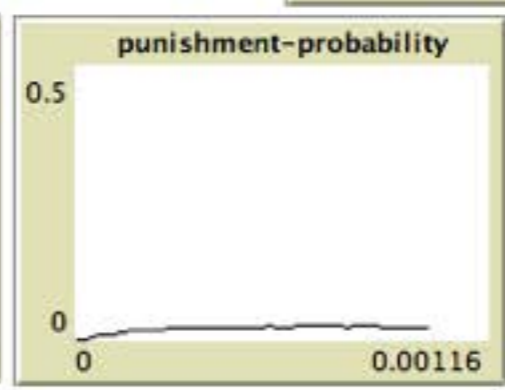
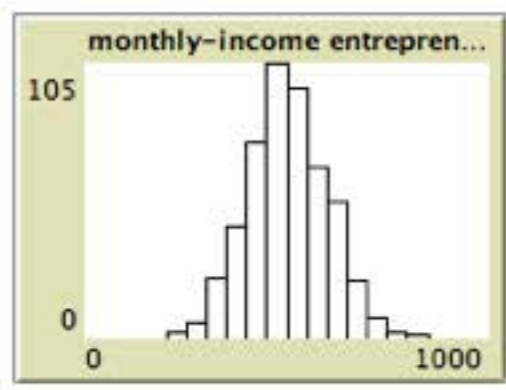
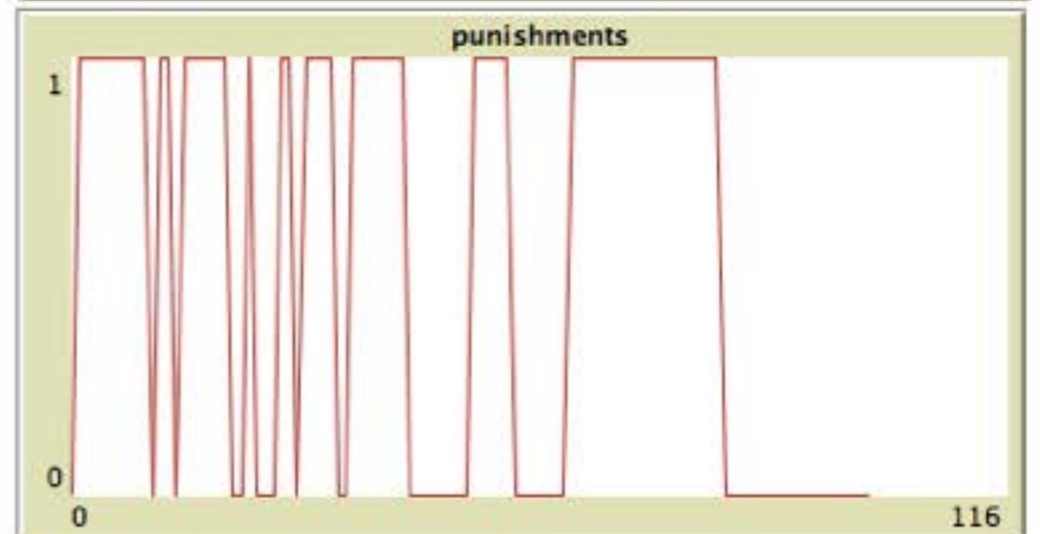
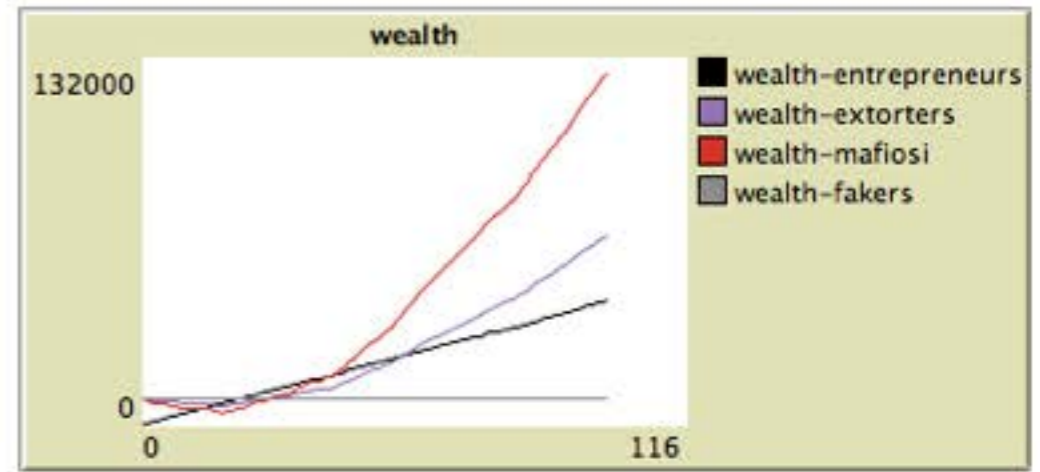
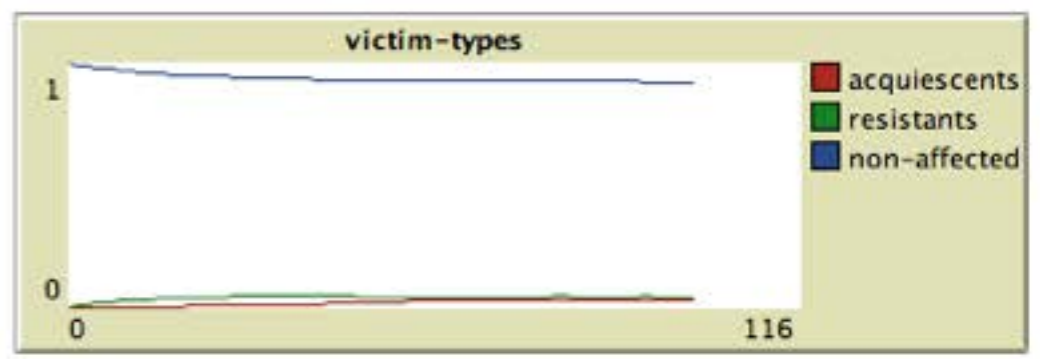
pizzo 150
 damages 1000000
 cost 951

entrepreneurs 500
 extorters 2

initial-punishment-probability 0.0
 faker-punishment-frequency 5



extorter-wealth 26508.22
 entrepreneur-wealth 22310.12
 punishments 55

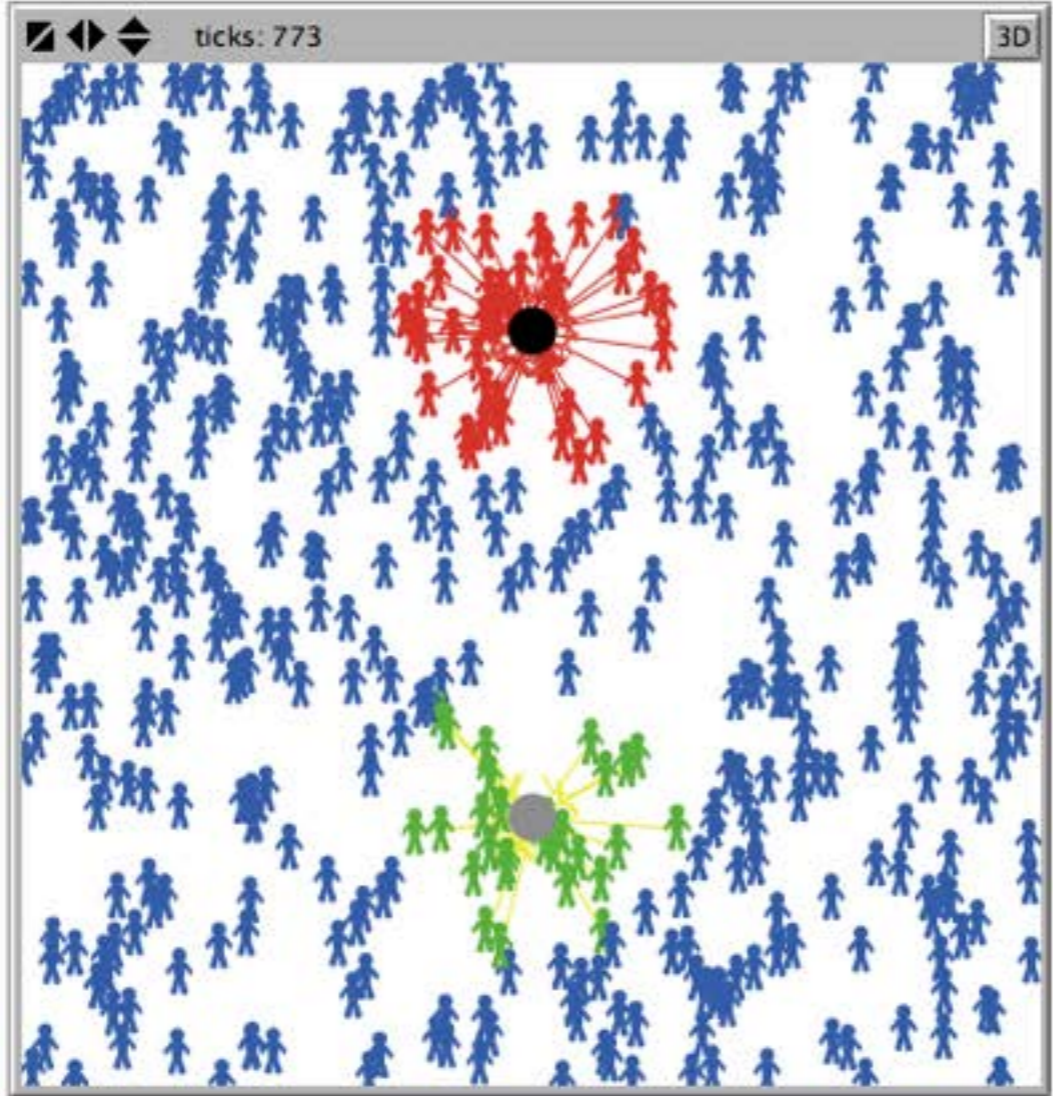


number-of-entrepreneurs 500
 number-of-extorters 2
 number-of-fakers 1
 extorter-radius 3

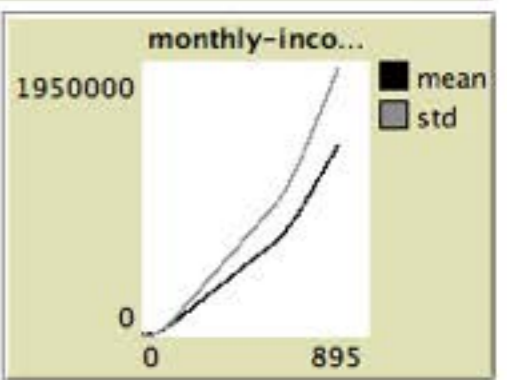
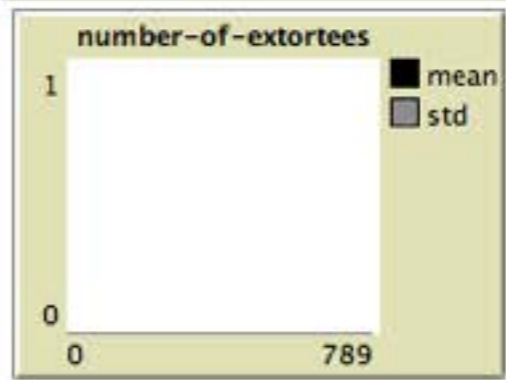
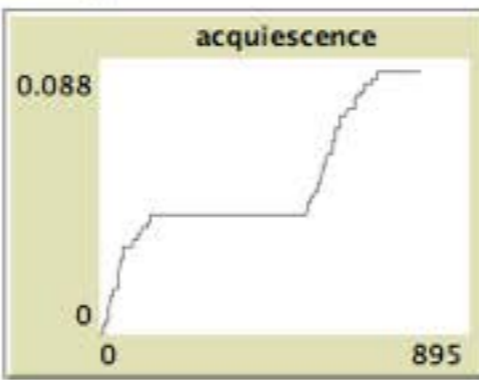
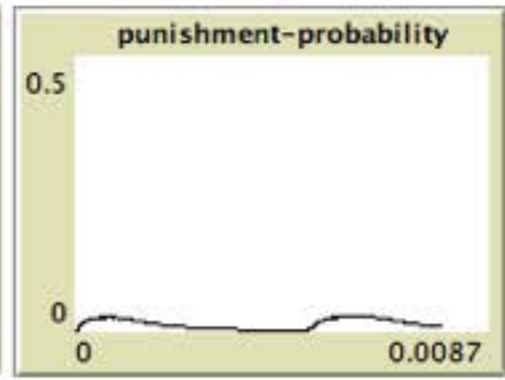
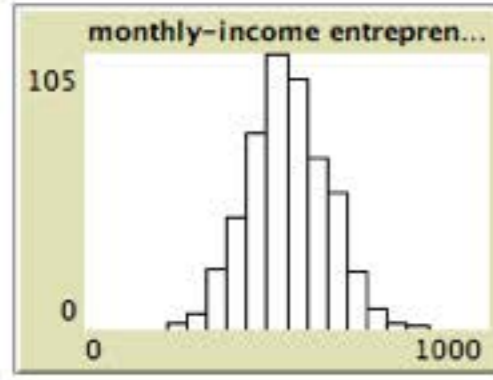
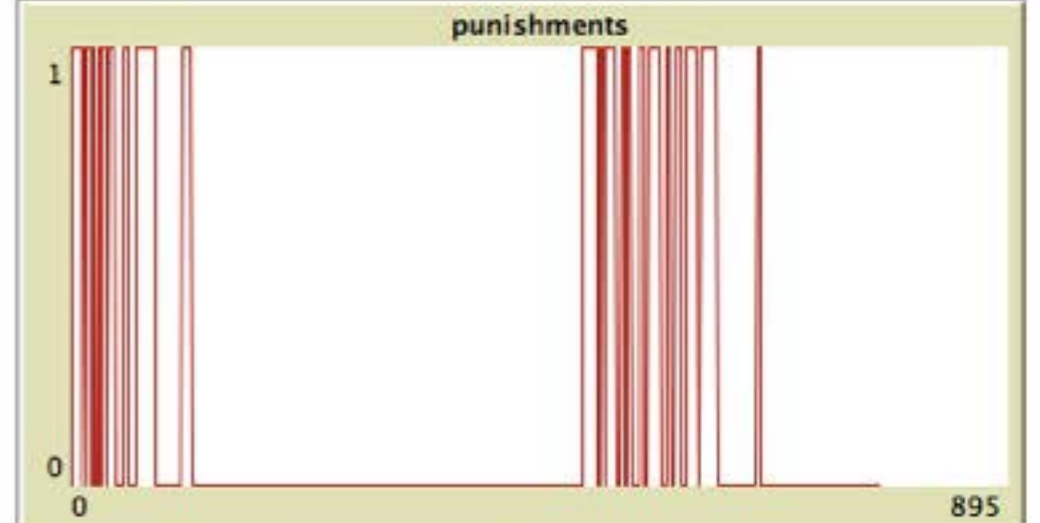
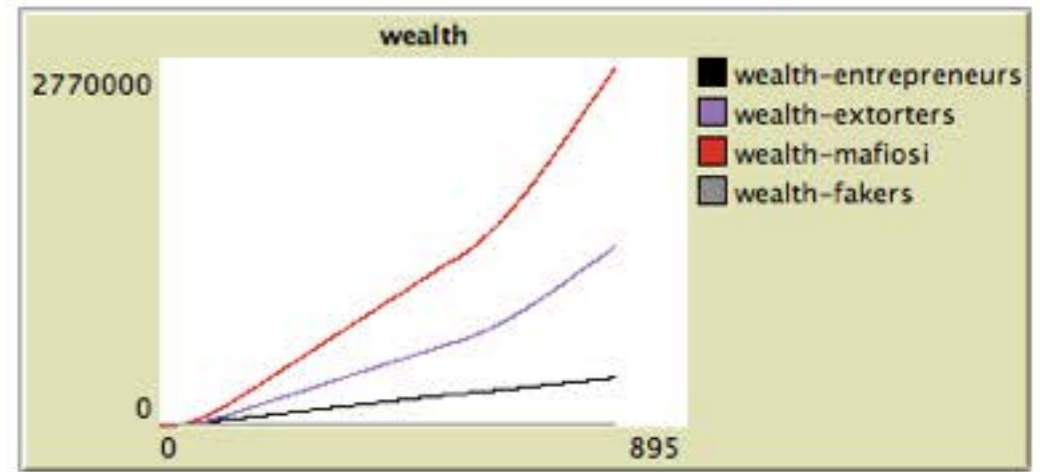
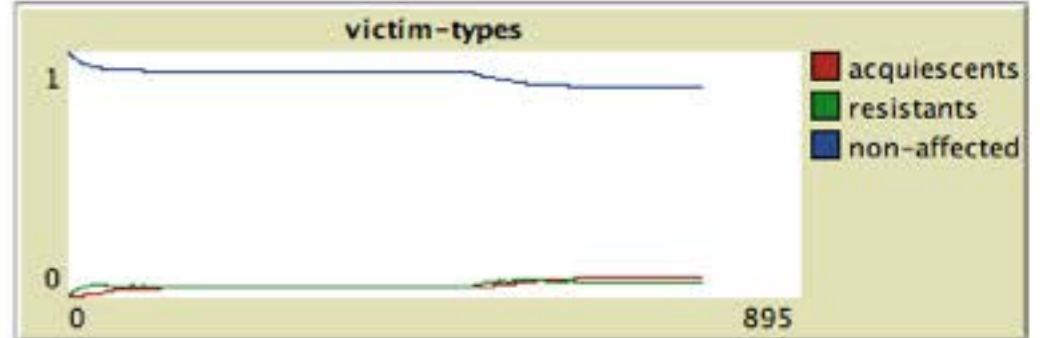
pizzo 150
 damages 1000000
 cost 951

entrepreneurs 500
 extorters 2

initial-punishment-probability 0.0
 faker-punishment-frequency 5



extorter-wealth 510426.32
 entrepreneur-wealth 181822.11
 punishments 155

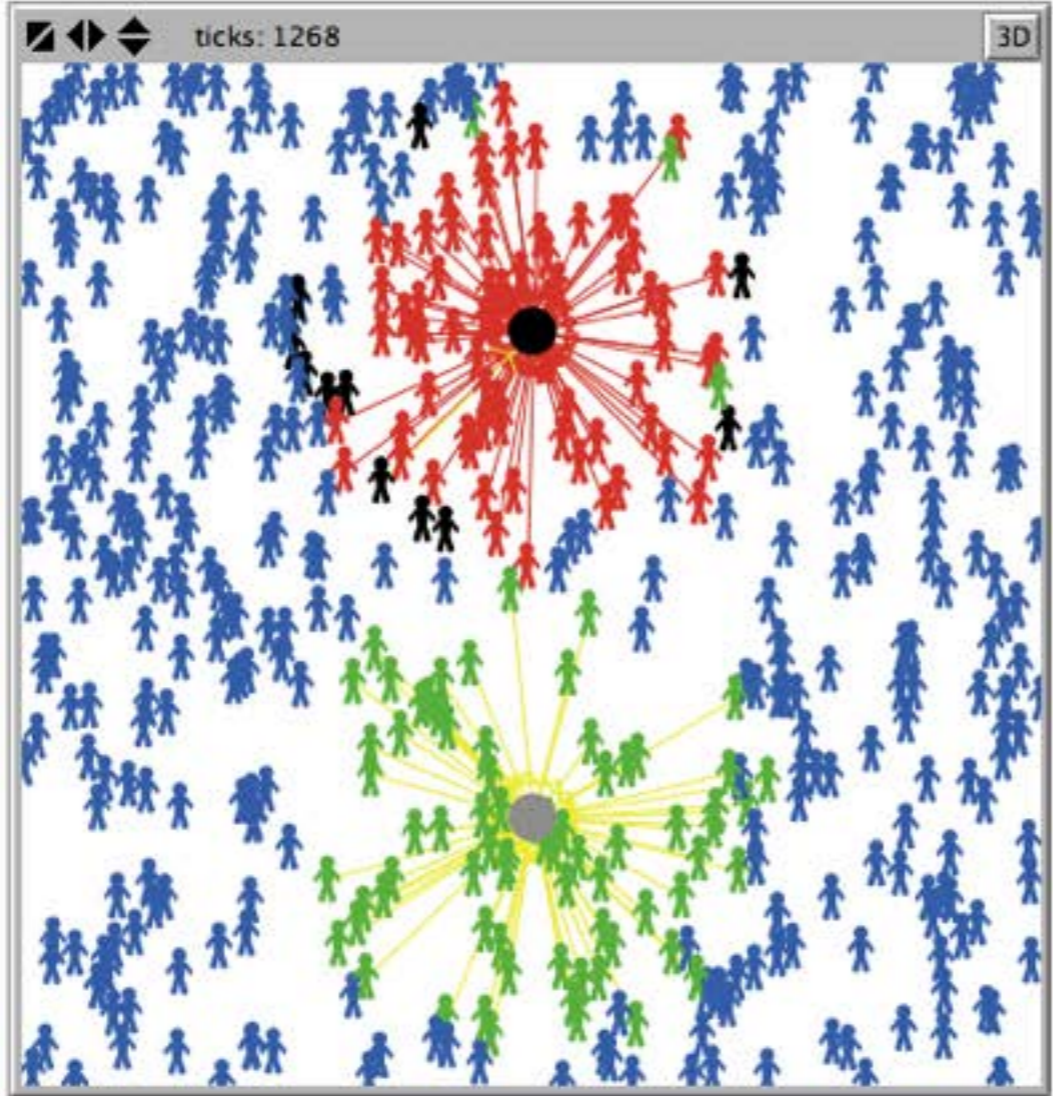


number-of-entrepreneurs 500
 number-of-extorters 2
 number-of-fakers 1
 extorter-radius 5

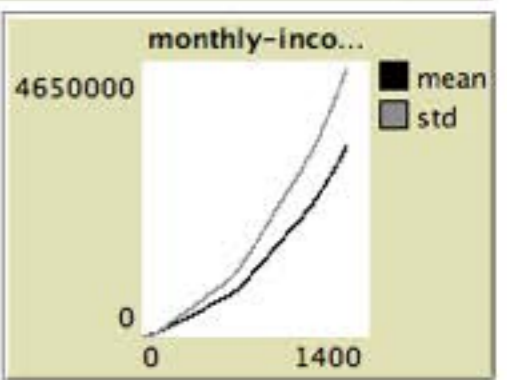
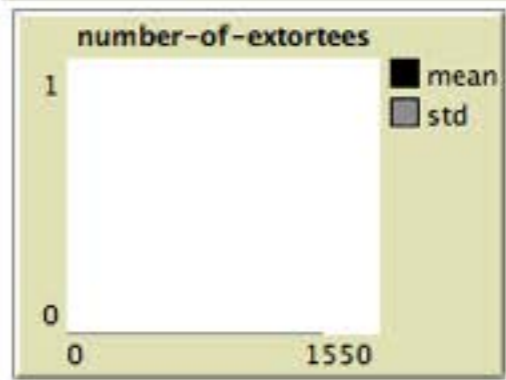
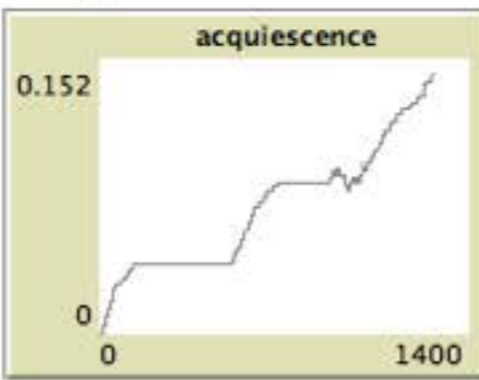
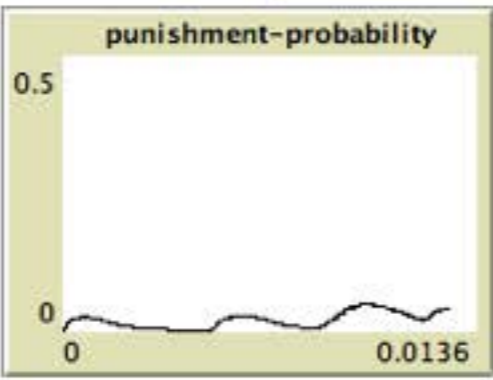
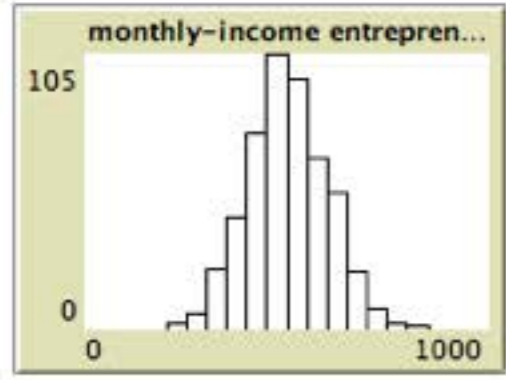
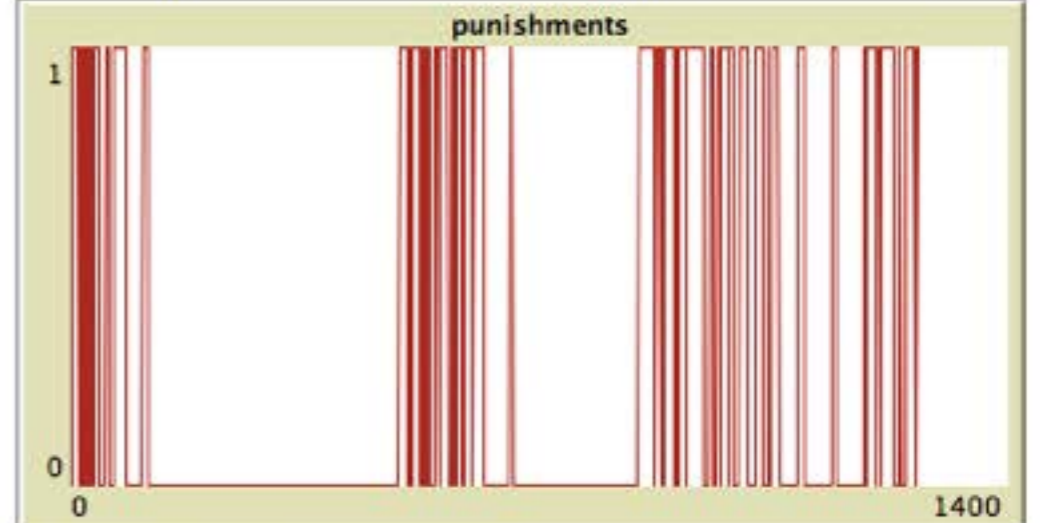
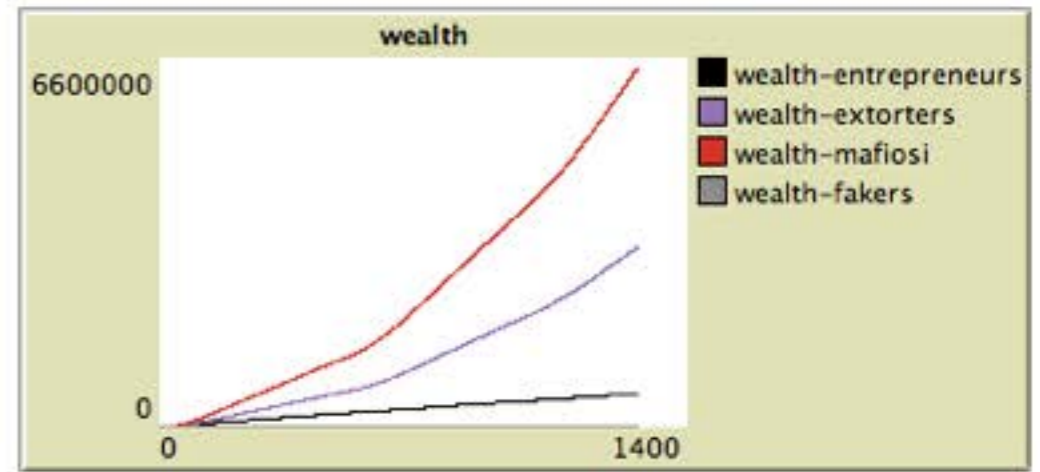
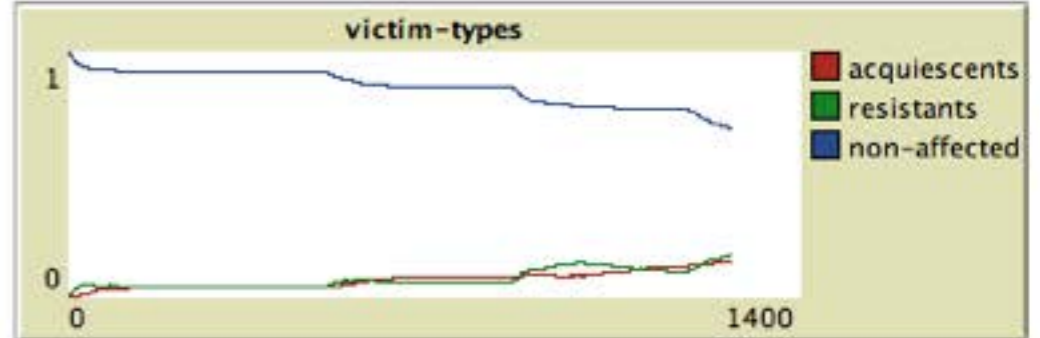
pizzo 150
 damages 1000000
 cost 951

entrepreneurs 500
 extorters 2

initial-punishment-probability 0.0
 faker-punishment-frequency 5



extorter-wealth 1162683.3
 entrepreneur-wealth 297391.3
 punishments 379

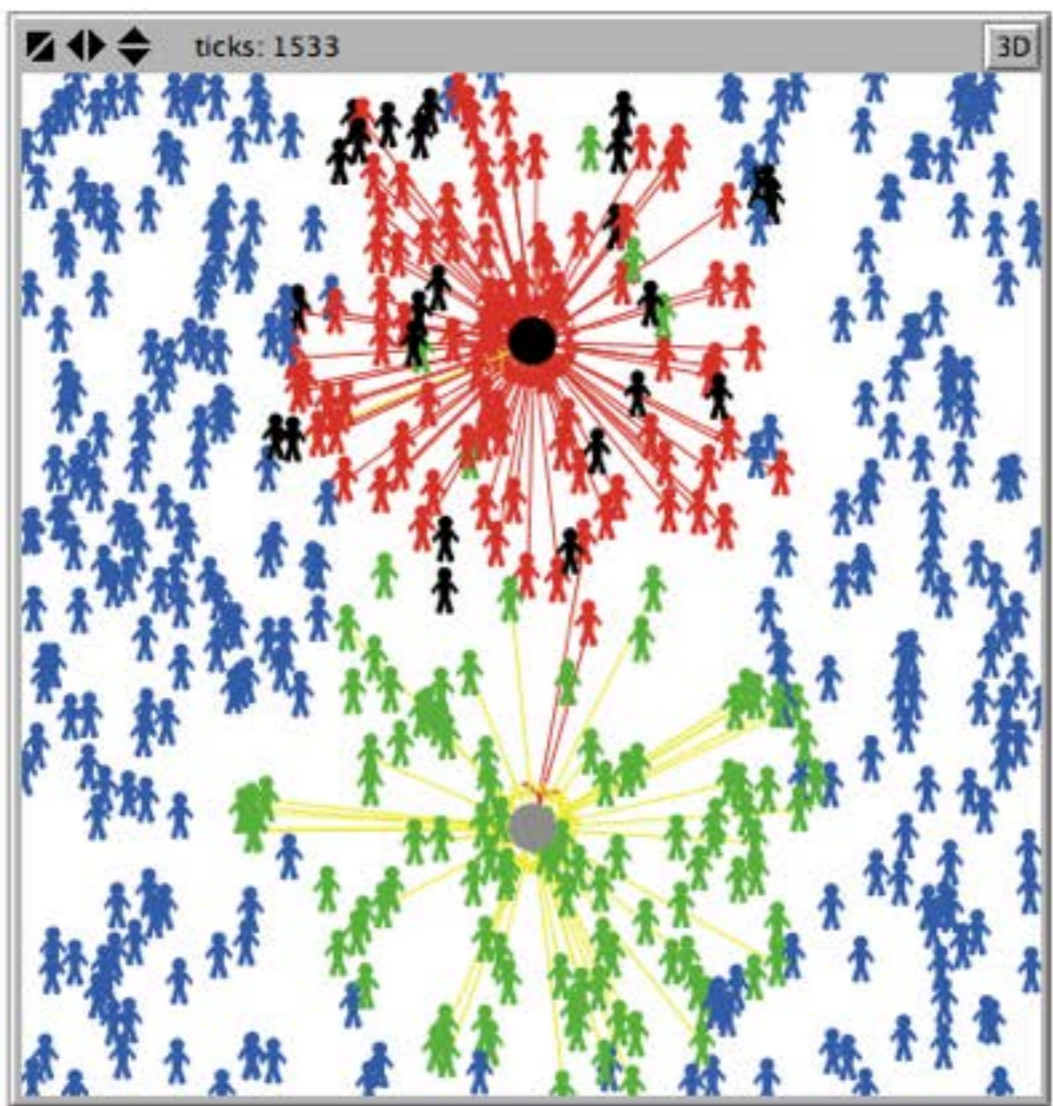


number-of-entrepreneurs 500
 number-of-extorters 2
 number-of-fakers 1
 extorter-radius 6

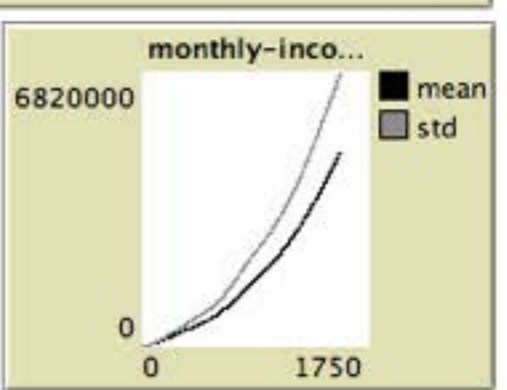
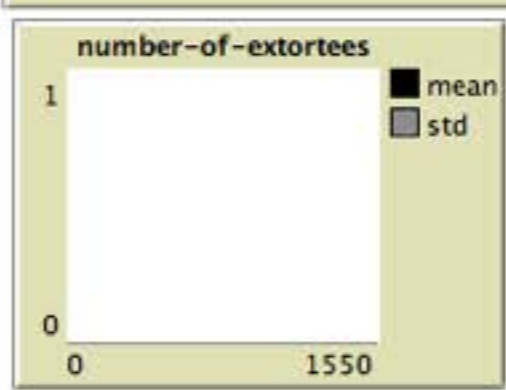
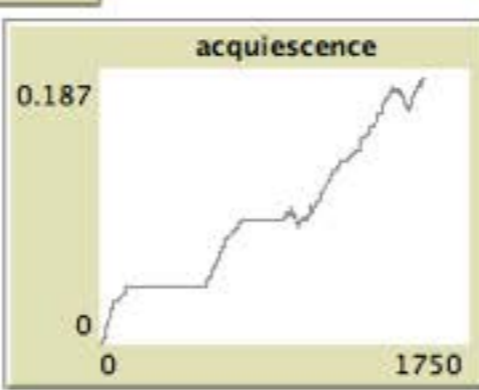
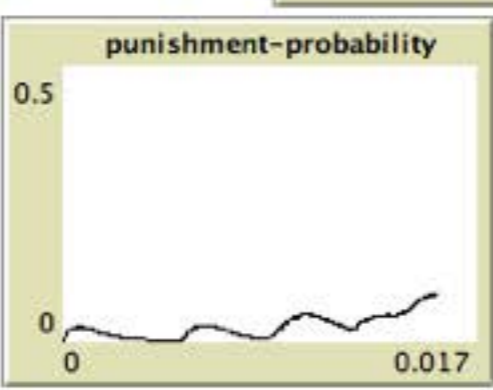
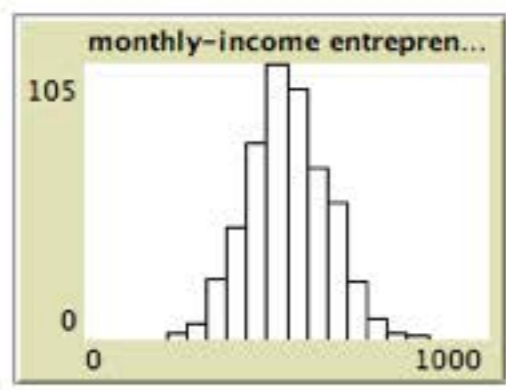
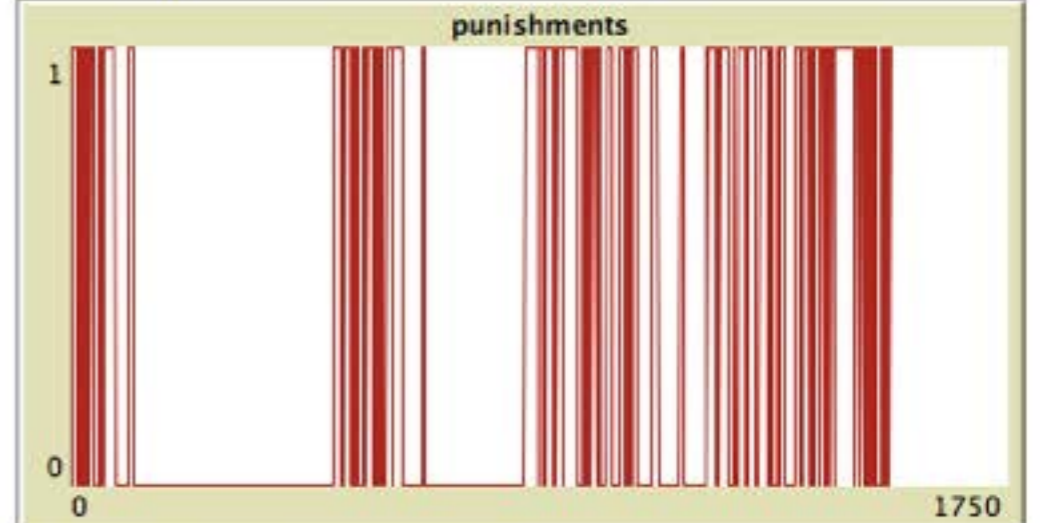
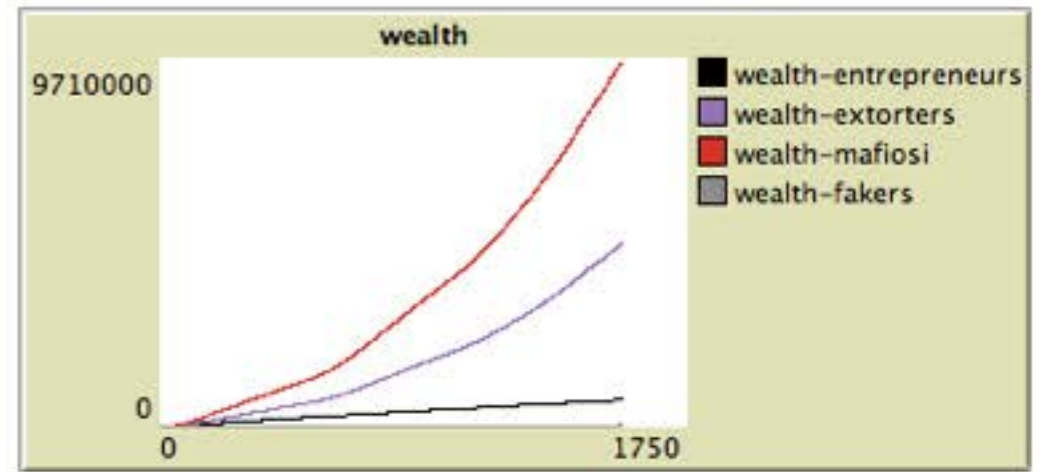
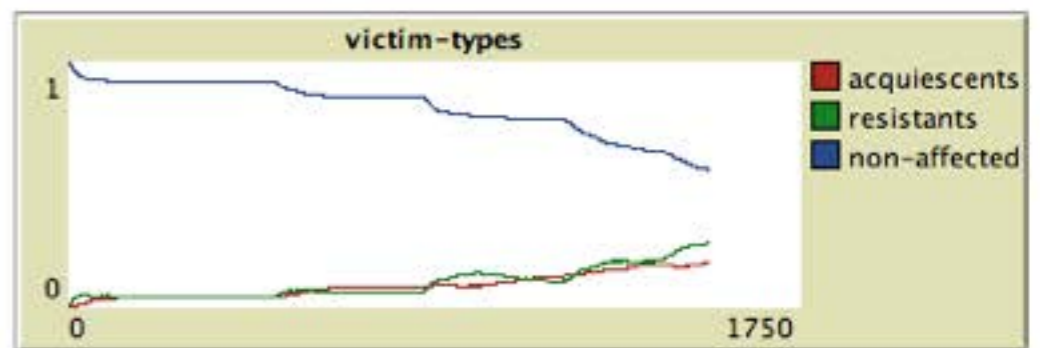
pizzo 150
 damages 1000000
 cost 951

entrepreneurs 500
 extorters 2

initial-punishment-probability 0.0
 faker-punishment-frequency 5



extorter-wealth 1653629.85
 entrepreneur-wealth 356886.55
 punishments 546

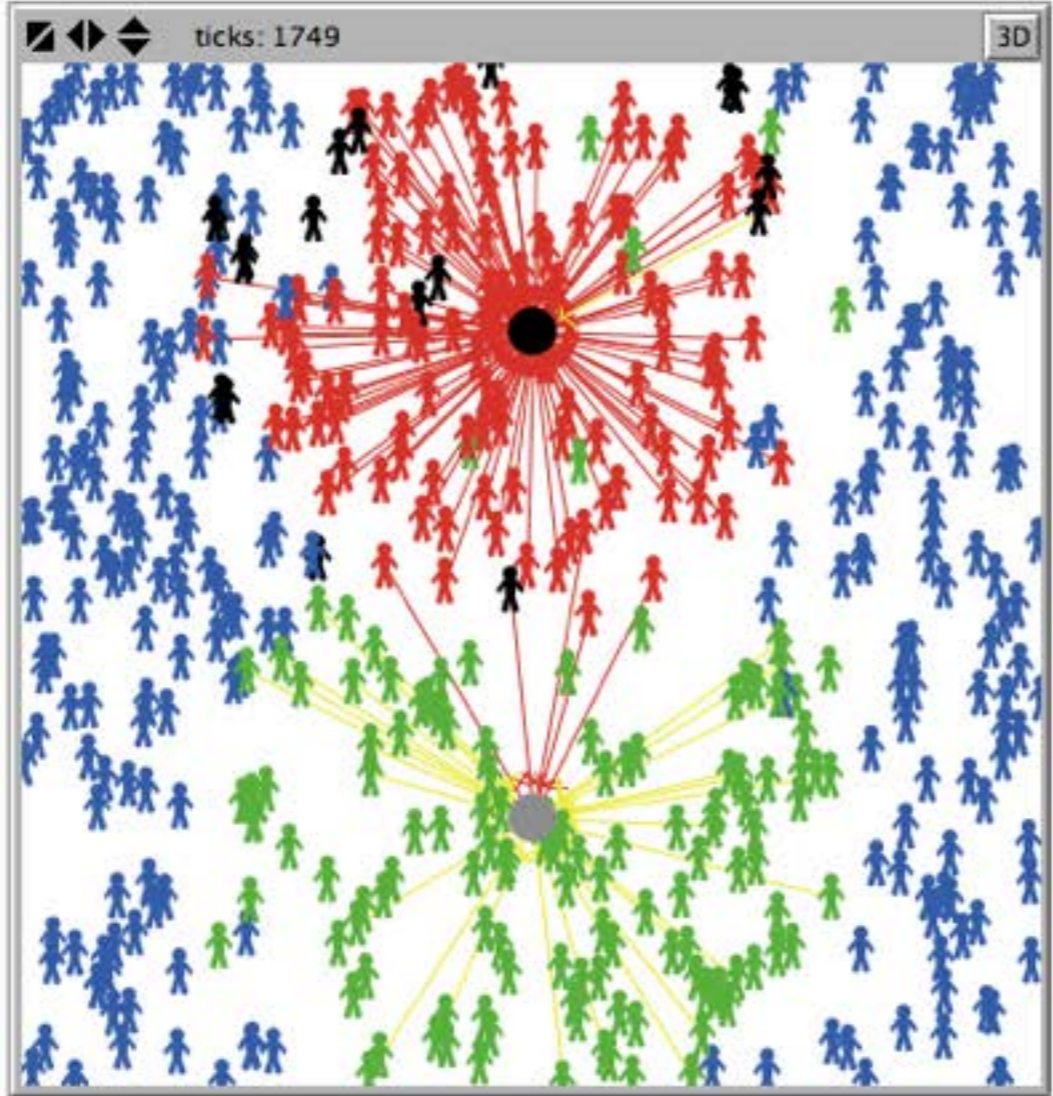


number-of-entrepreneurs 500
 number-of-extorters 2
 number-of-fakers 1
 extorter-radius 7

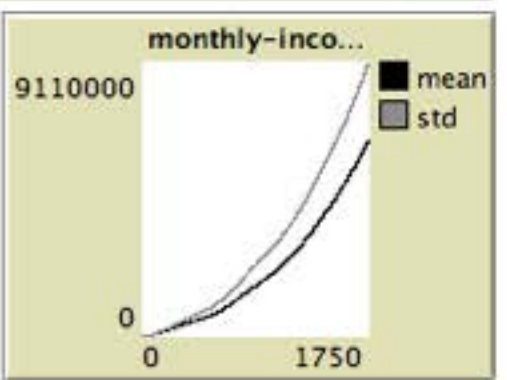
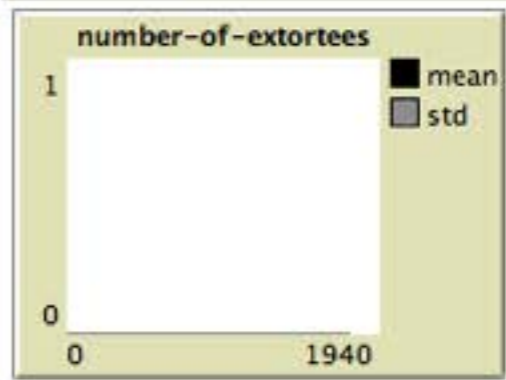
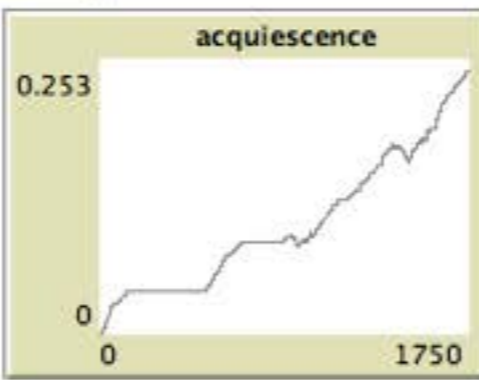
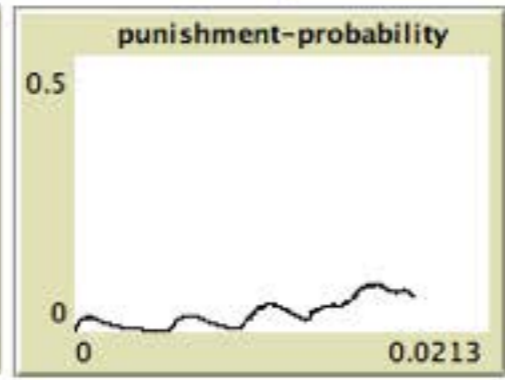
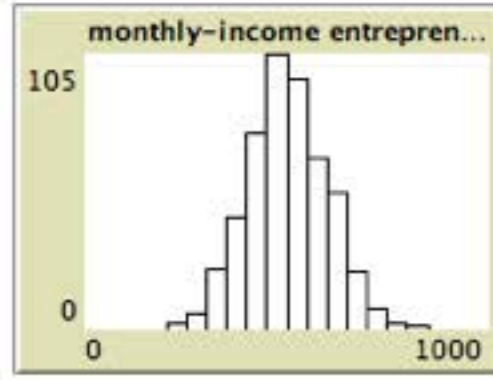
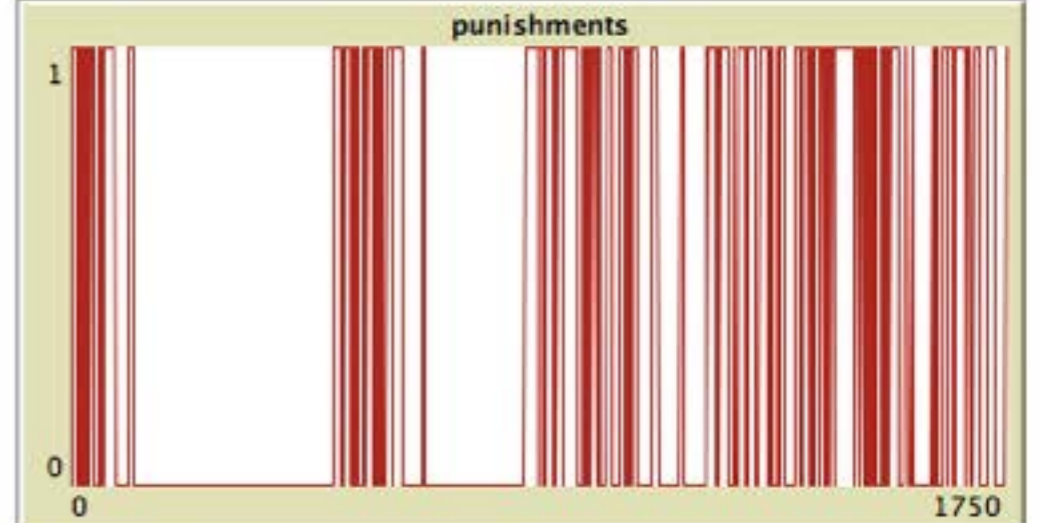
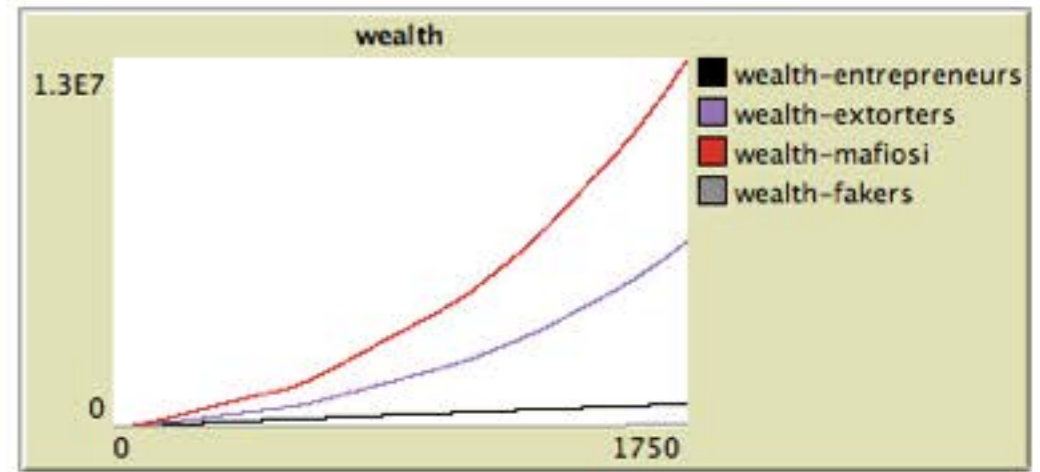
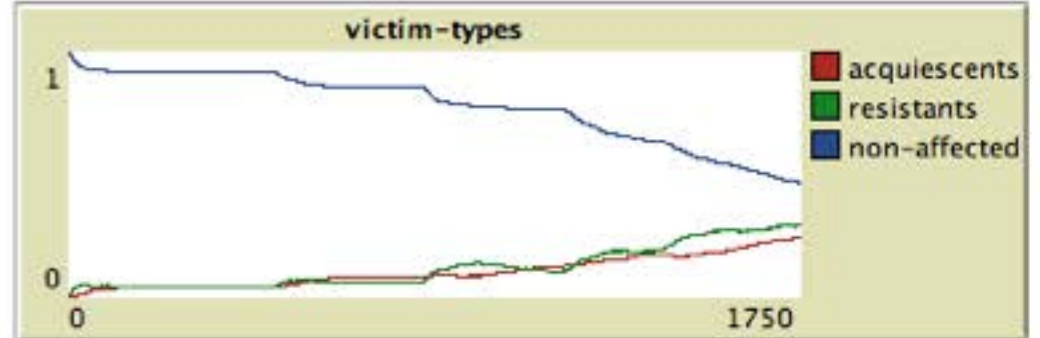
pizzo 150
 damages 1000000
 cost 951

entrepreneurs 500
 extorters 2

initial-punishment-probability 0.0
 faker-punishment-frequency 5



extorter-wealth 2143881.56
 entrepreneur-wealth 404548.01
 punishments 643

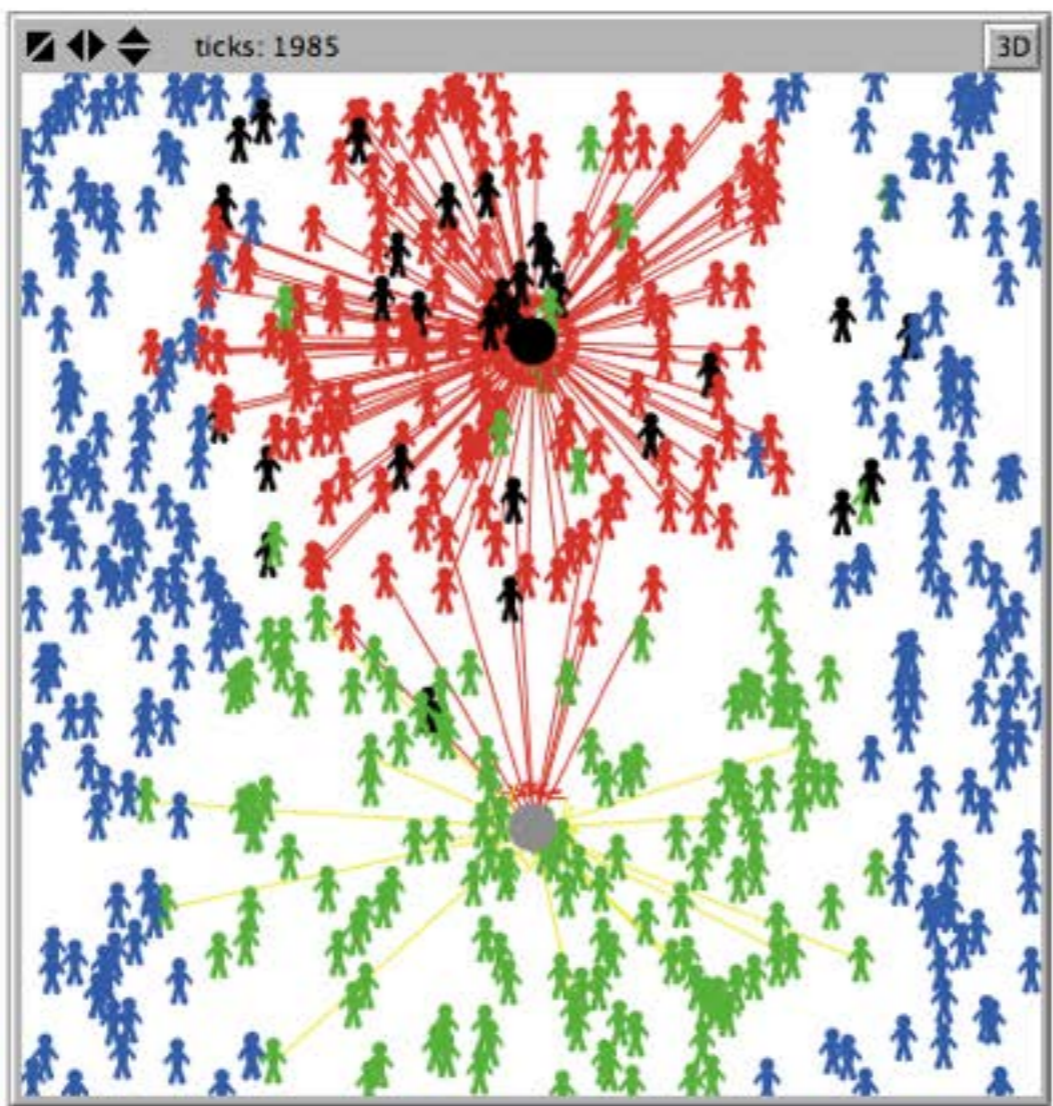


number-of-entrepreneurs 500
 number-of-extorters 2
 number-of-fakers 1
 extorter-radius 8

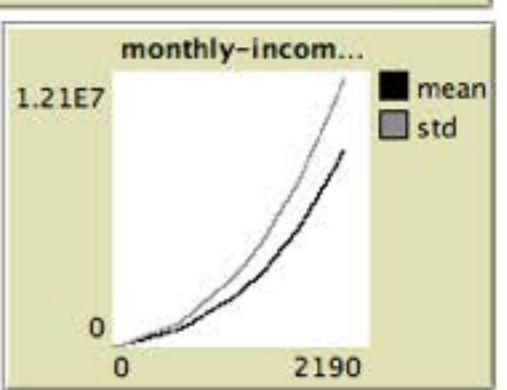
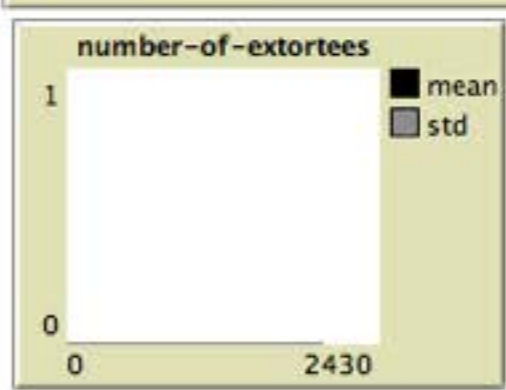
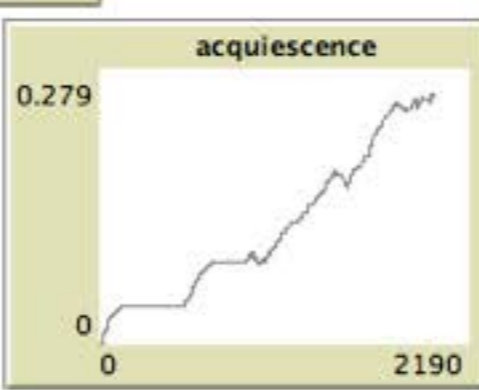
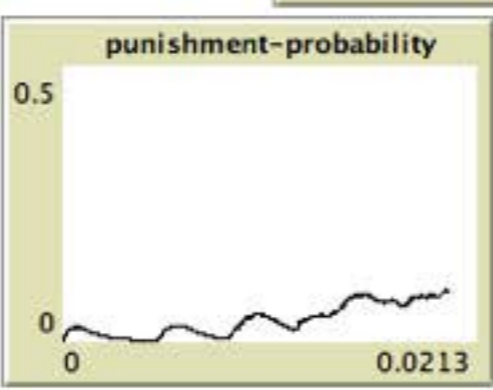
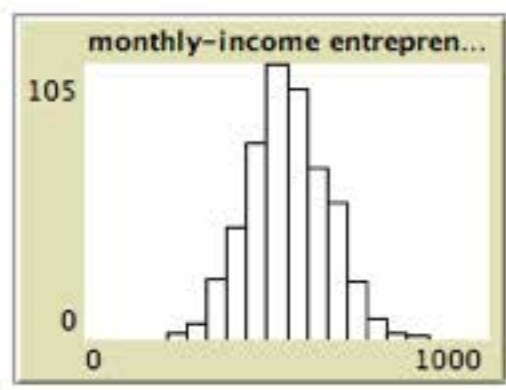
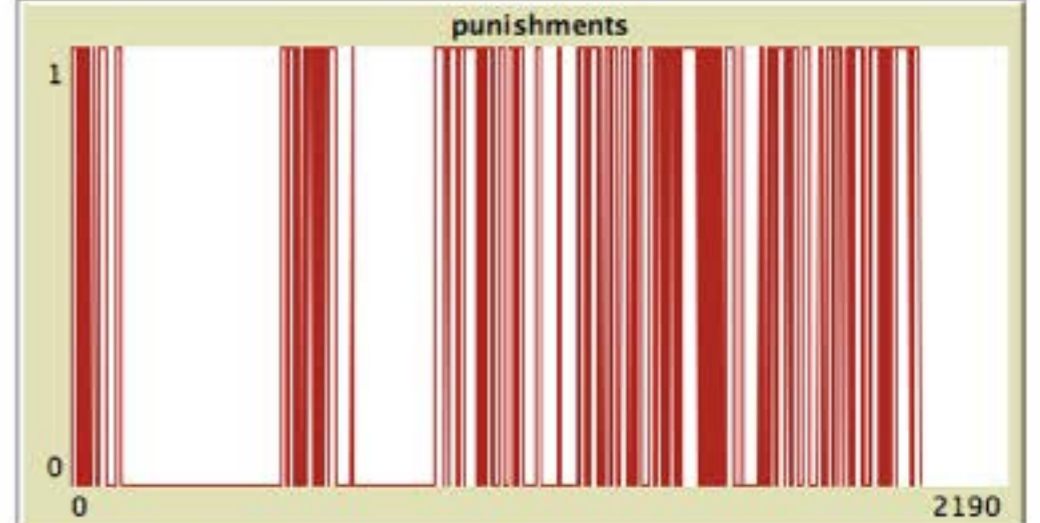
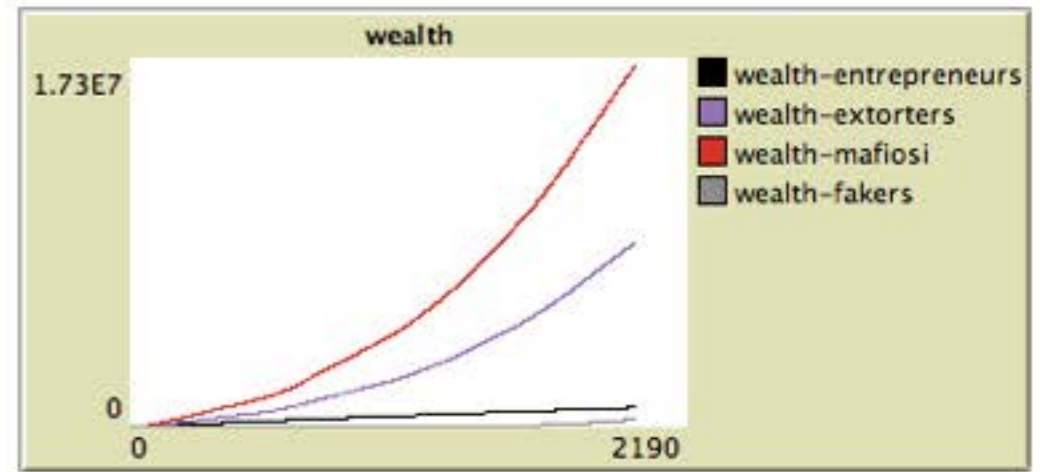
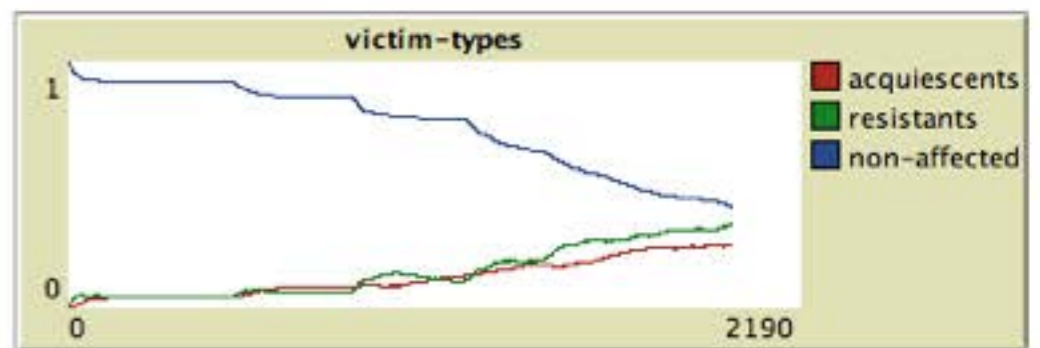
pizzo 150
 damages 1000000
 cost 951

entrepreneurs 500
 extorters 2

initial-punishment-probability 0.0
 faker-punishment-frequency 5



extorter-wealth 2510091.87
 entrepreneur-wealth 434743.66
 punishments 729

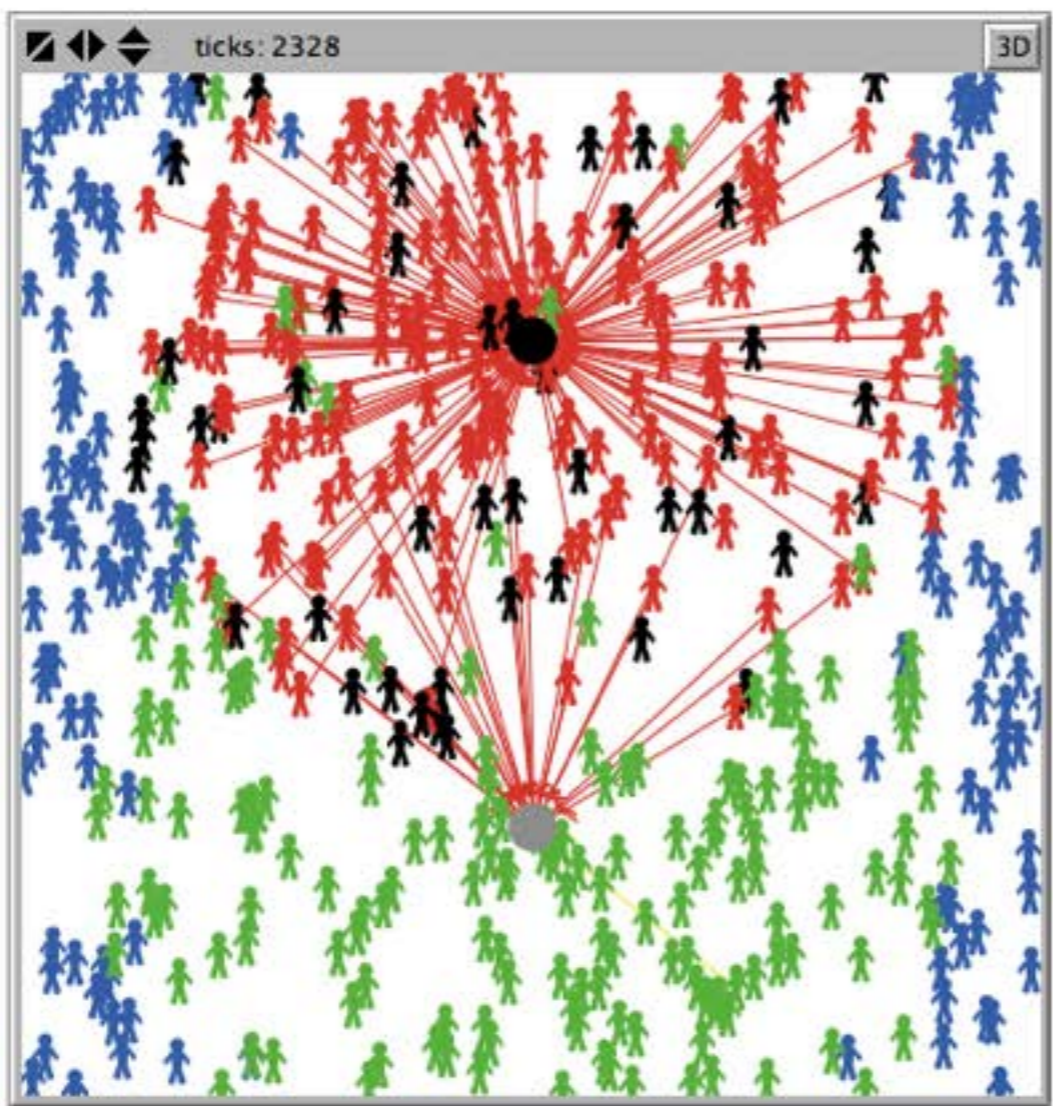


number-of-entrepreneurs 500
 number-of-extorters 2
 number-of-fakers 1
 extorter-radius 9

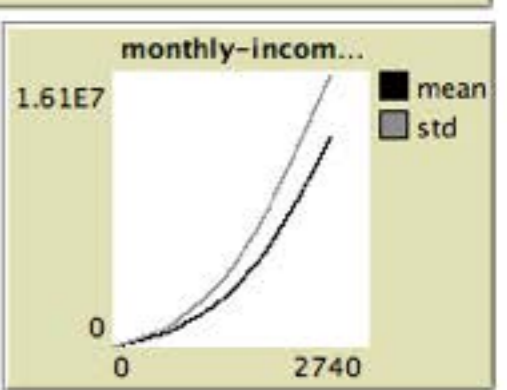
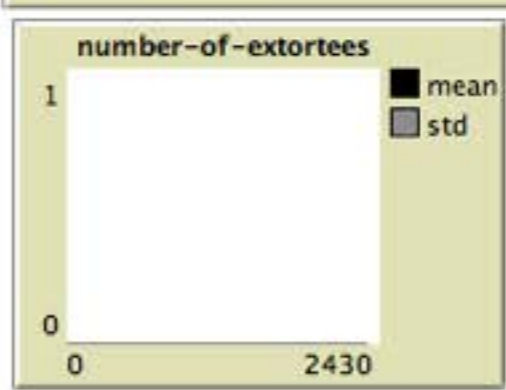
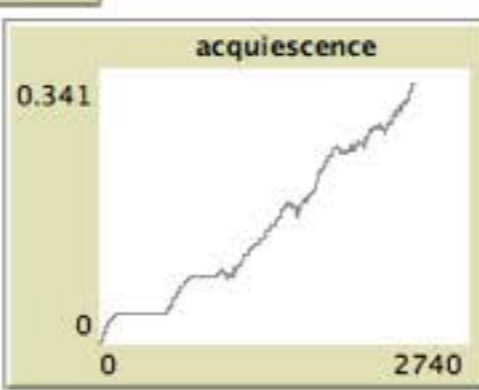
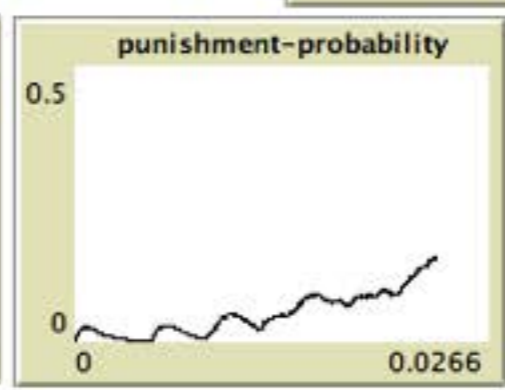
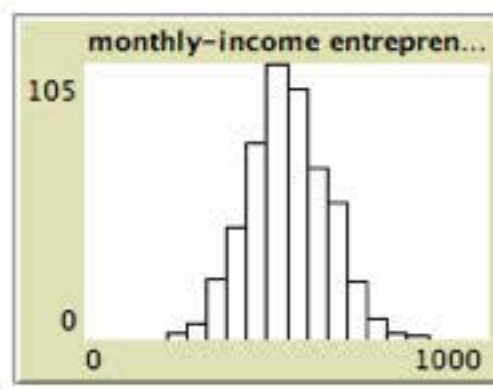
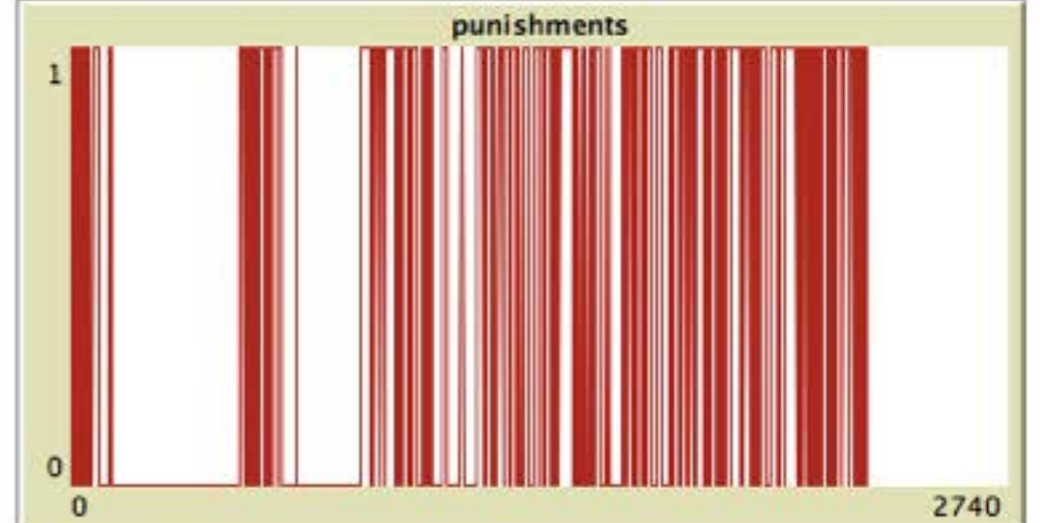
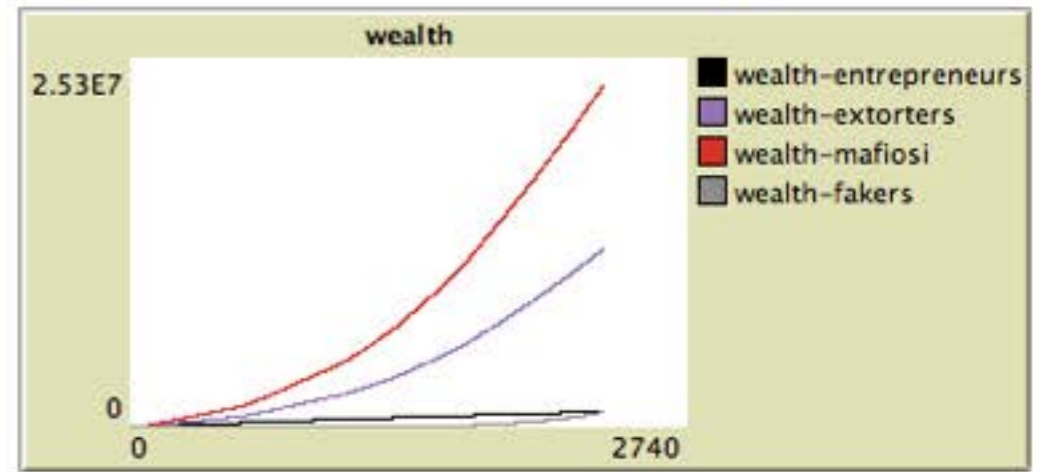
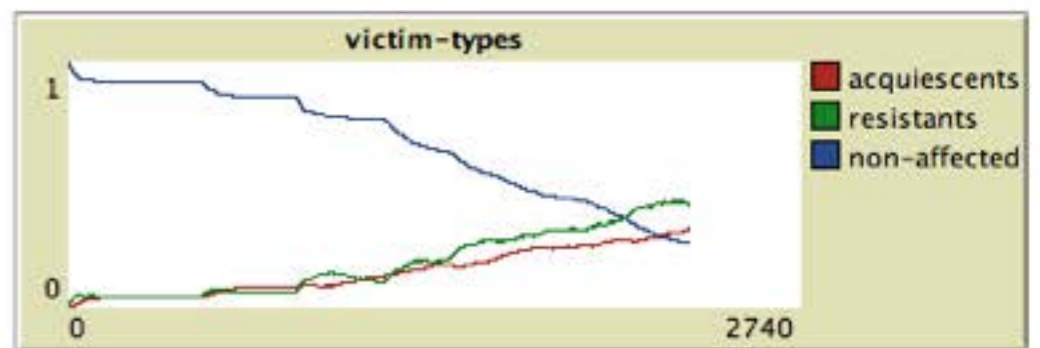
pizzo 150
 damages 1000000
 cost 951

entrepreneurs 500
 extorters 2

initial-punishment-probability 0.0
 faker-punishment-frequency 5



extorter-wealth 3873405.11
 entrepreneur-wealth 526540.56
 punishments 1041

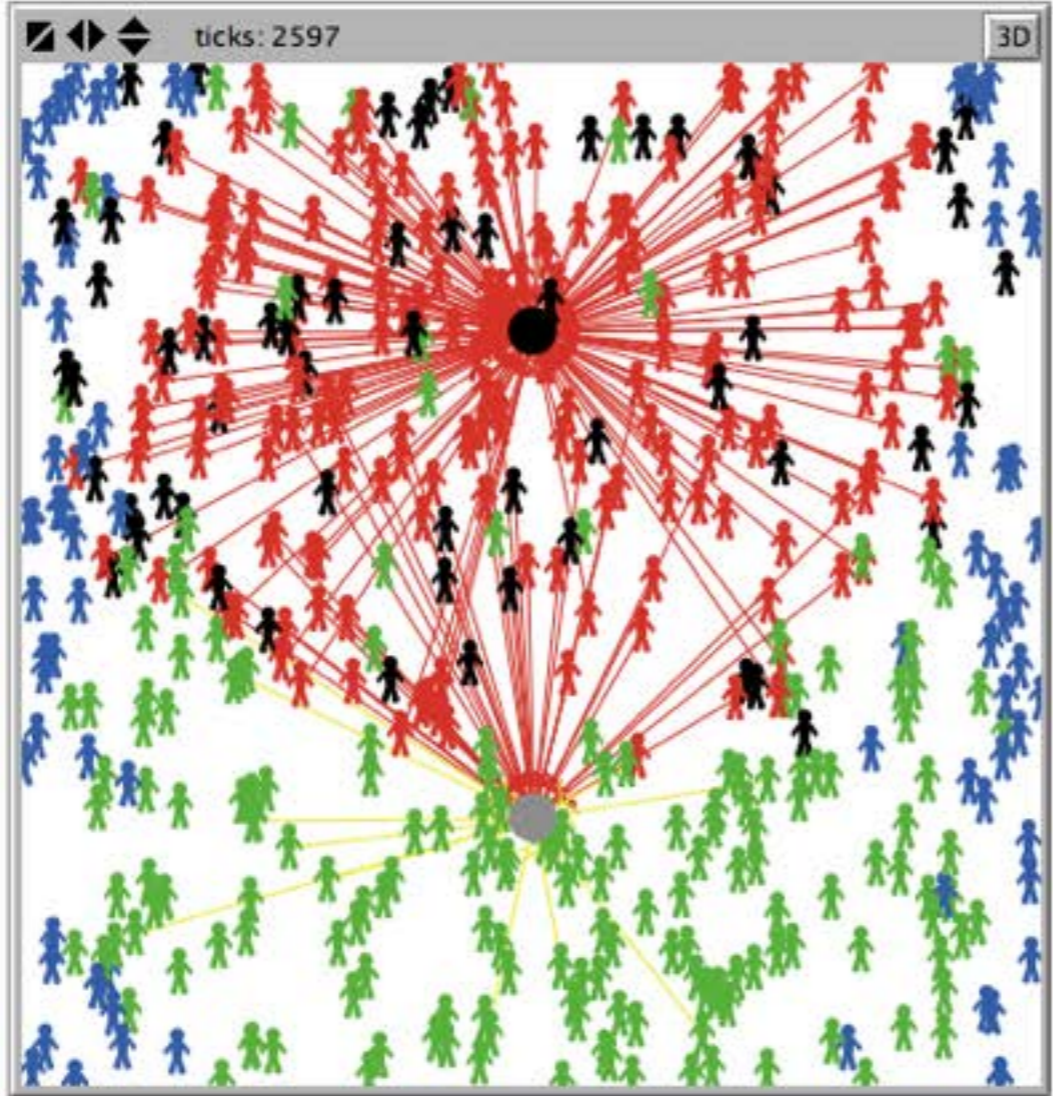


number-of-entrepreneurs 500
 number-of-extorters 2
 number-of-fakers 1
 extorter-radius 10

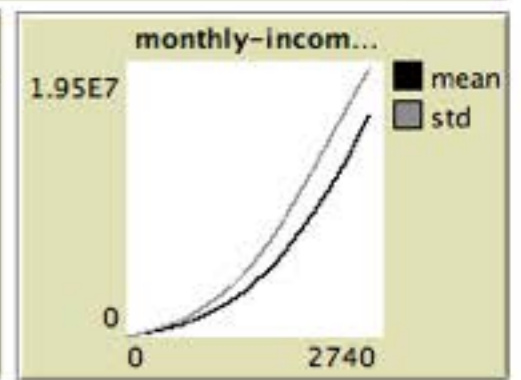
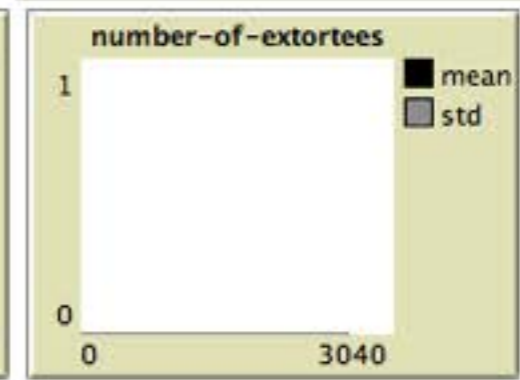
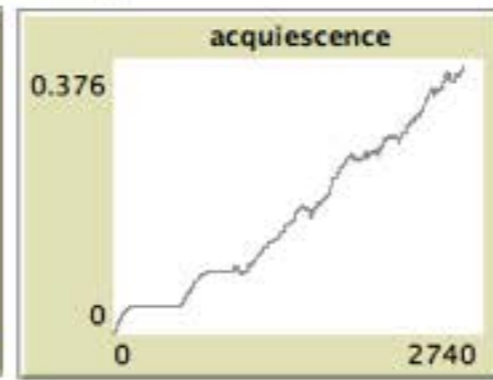
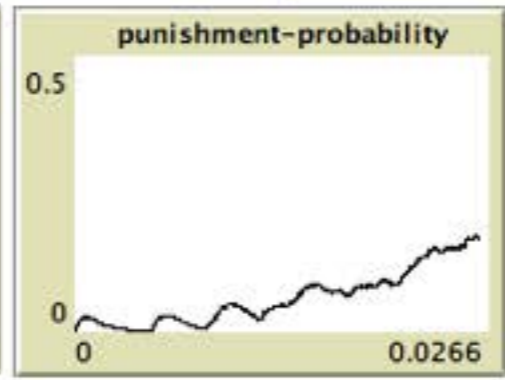
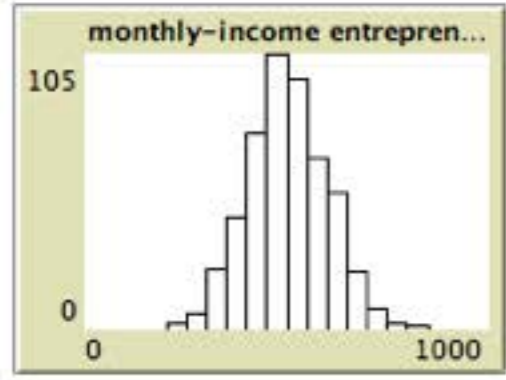
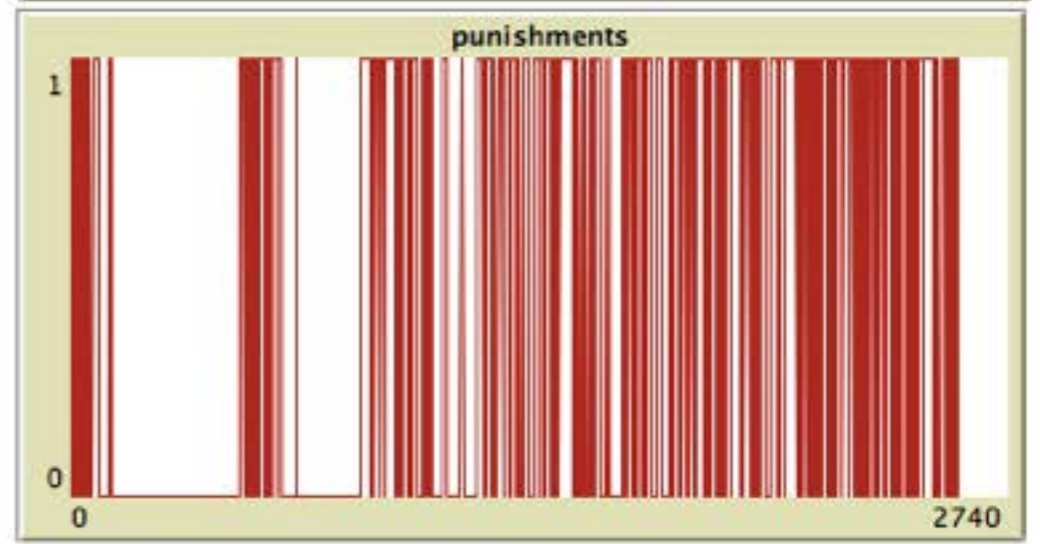
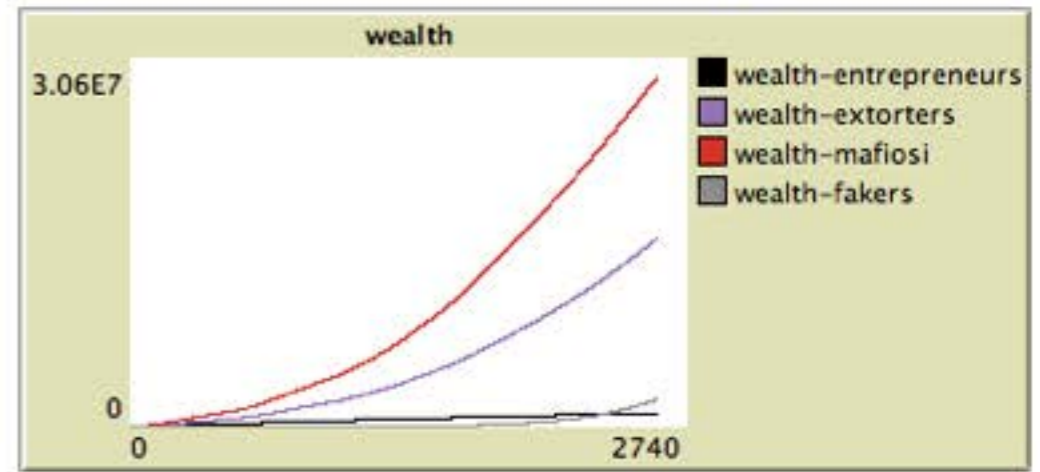
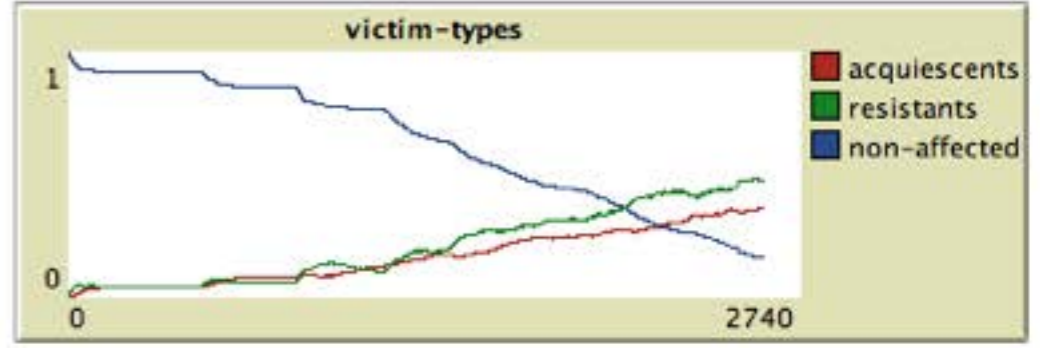
pizzo 150
 damages 1000000
 cost 951

entrepreneurs 500
 extorters 2

initial-punishment-probability 0.0
 faker-punishment-frequency 5



extorter-wealth 4927129.06
 entrepreneur-wealth 583628.02
 punishments 1211



Only when fakers get in on the reputation of the Mafia can they get in on the action.

Results of the Faker Game

Comparison

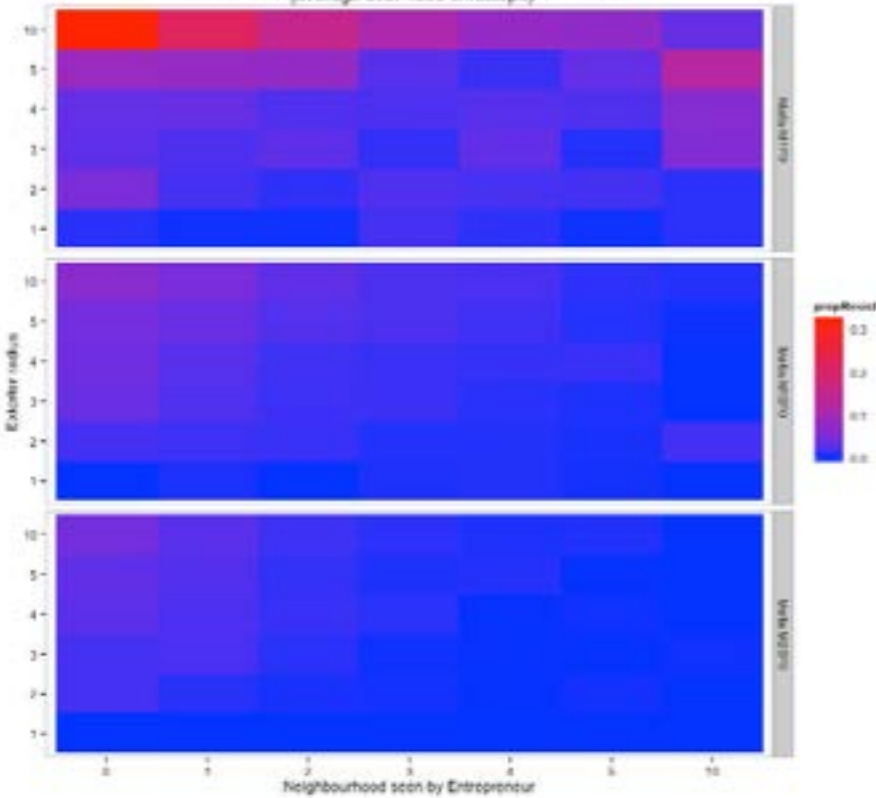
• Resistance

- Fakers increase resistance
- neighbourhood radius decreases resistance and punishments
- extorter radius increases resistance

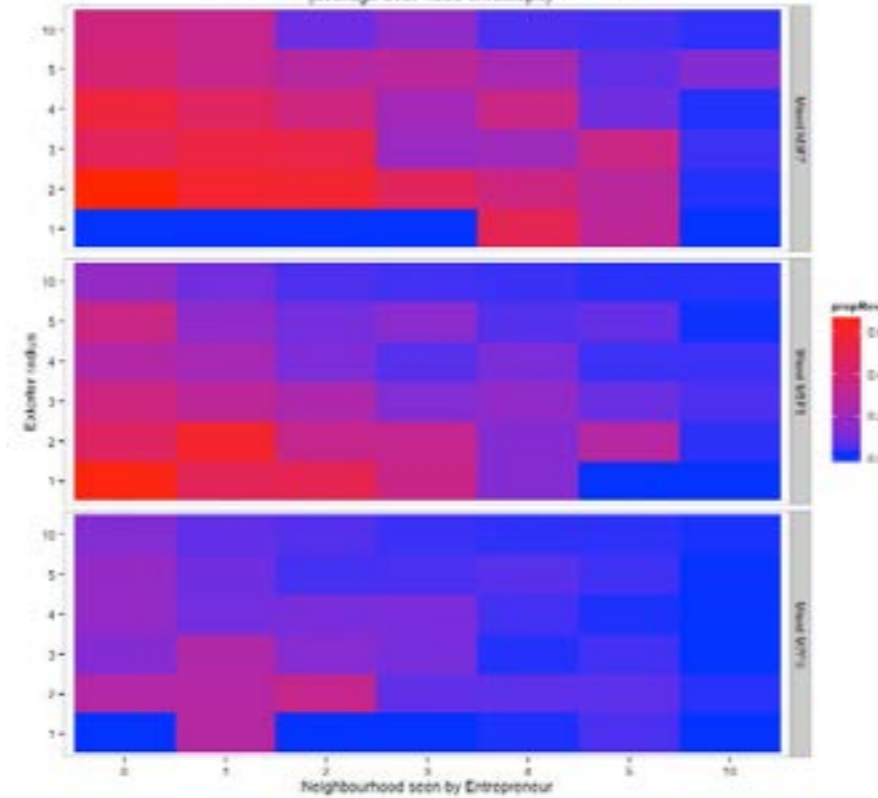
• Punishments

- Fakers increase punishments
- neighbourhood radius decreases punishment
- extorter radius increases punishments

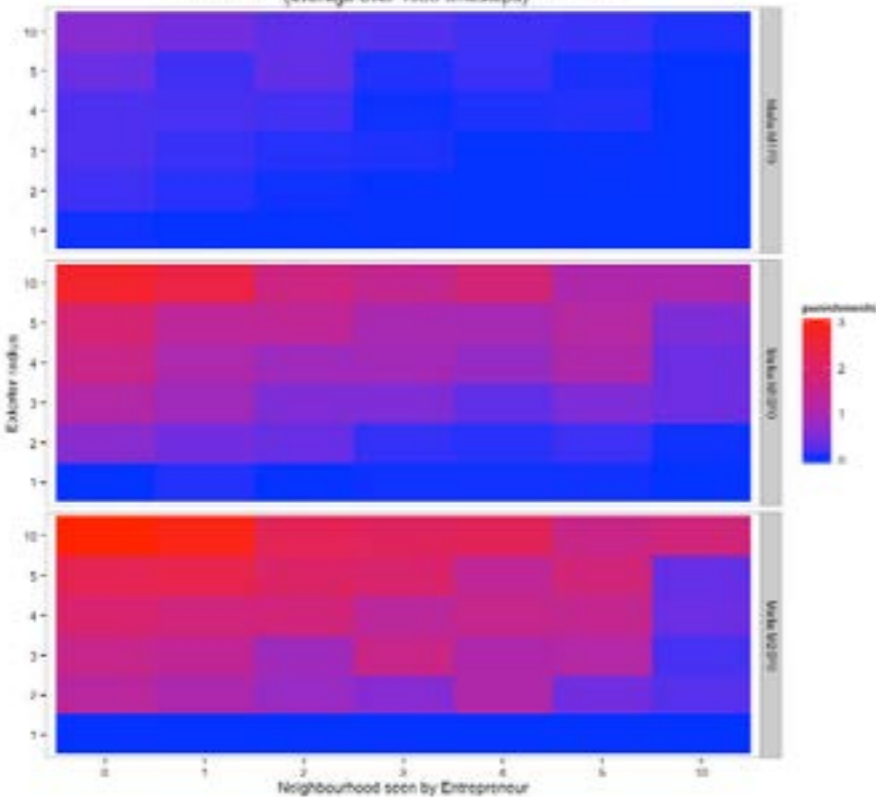
Effect of extorter and entrepreneur radii on Mafia wealth
(average over 1000 timesteps)



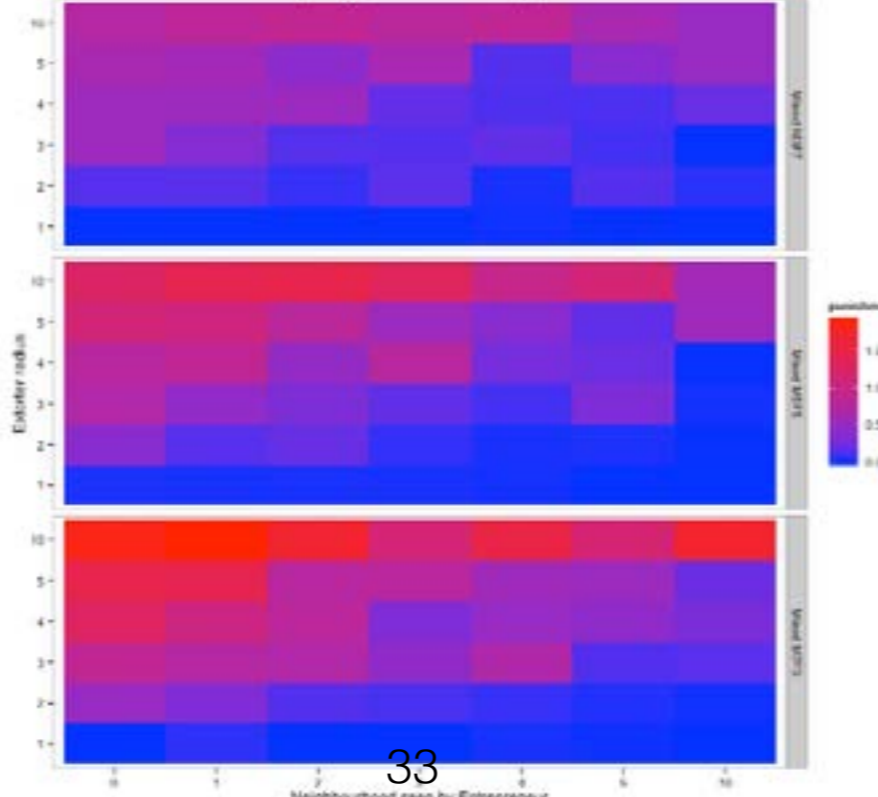
Effect of extorter and entrepreneur radii on Mafia wealth
(average over 1000 timesteps)



Effect of extorter and entrepreneur radii on Mafia wealth
(average over 1000 timesteps)

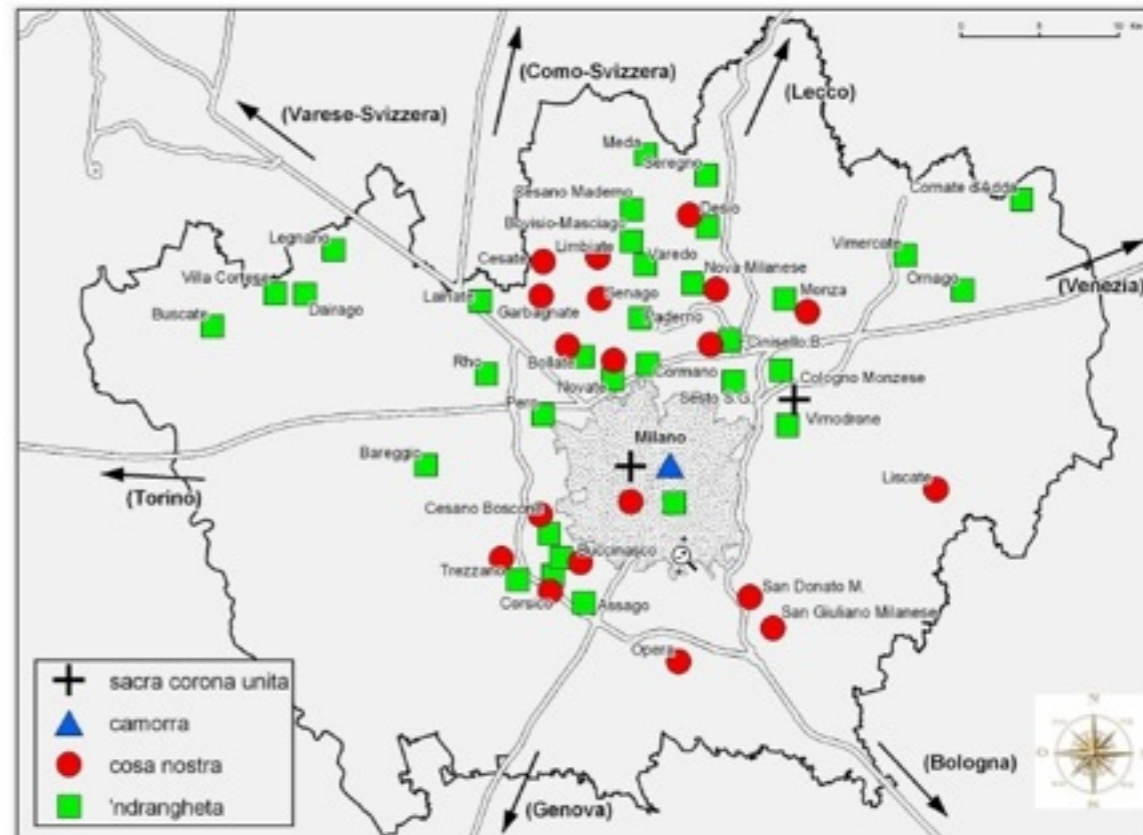


Effect of extorter and entrepreneur radii on Mafia wealth
(average over 1000 timesteps)



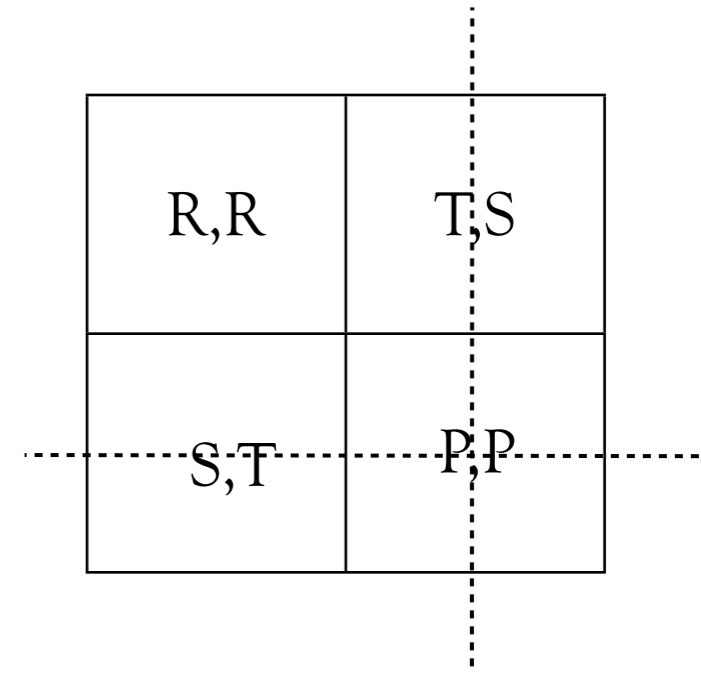
Extortion Rackets as Tragedies

- Seen a model interaction between extorter and victim (2 person PD)
- Also an interaction between the victims:
 - For each individual victim it is better to pay and not be punished
 - For all it would be better if nobody paid and everyone would denounce
 - Classic n-person Prisoner's Dilemma



Traditional Solutions to N-PD

- Altruism
- Norms
- Regulation
- Institutions

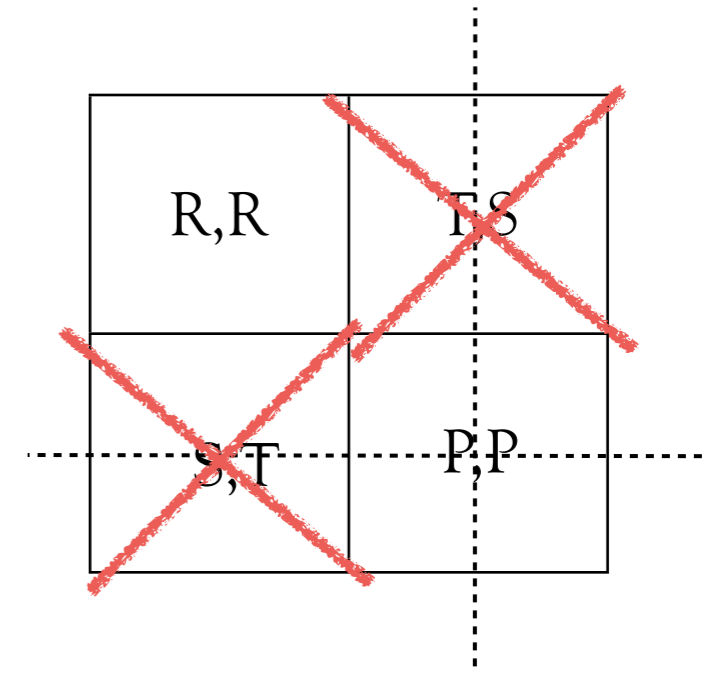


Traditional Solutions to N-PD

- Altruism
- Norms
- Regulation
- Institutions



artificially
constraining
choice



Traditional Solutions to N-PD

- Altruism
- Norms
- Regulation
- Institutions



artificially
constraining
choice

R,R	T,S
S,T	P,P

A 2x2 payoff matrix for a Prisoner's Dilemma game. The top-left cell contains 'R,R', the top-right 'T,S', the bottom-left 'S,T', and the bottom-right 'P,P'. The entire matrix is crossed out with a large red 'X'. Dashed lines indicate the horizontal and vertical axes.

Novel Solution

- Changing the Game
- Team Reasoning

R,R	T,S
S,T	P,P

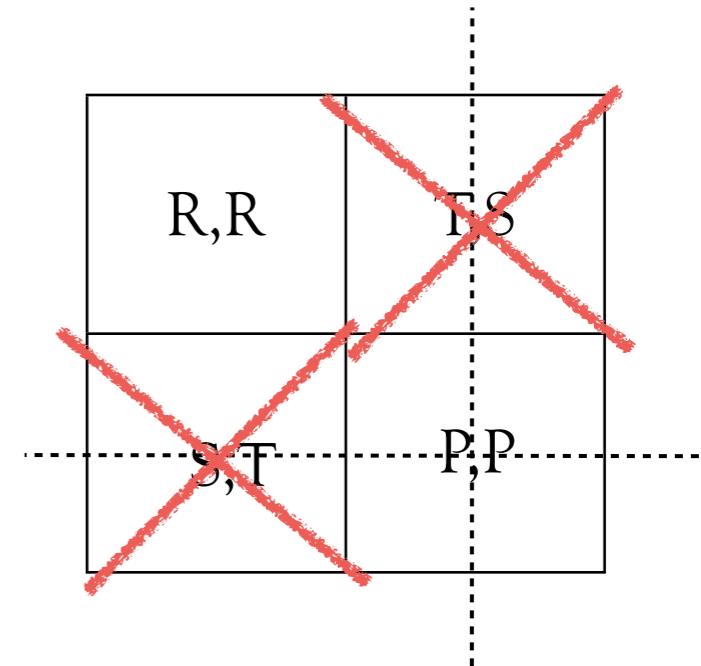
A 2x2 payoff matrix for a Prisoner's Dilemma game, identical to the one above. A dashed diagonal line runs from the top-left corner to the bottom-right corner, crossing through the 'R,R' and 'P,P' cells.

Traditional Solutions to N-PD

- Altruism
- Norms
- Regulation
- Institutions

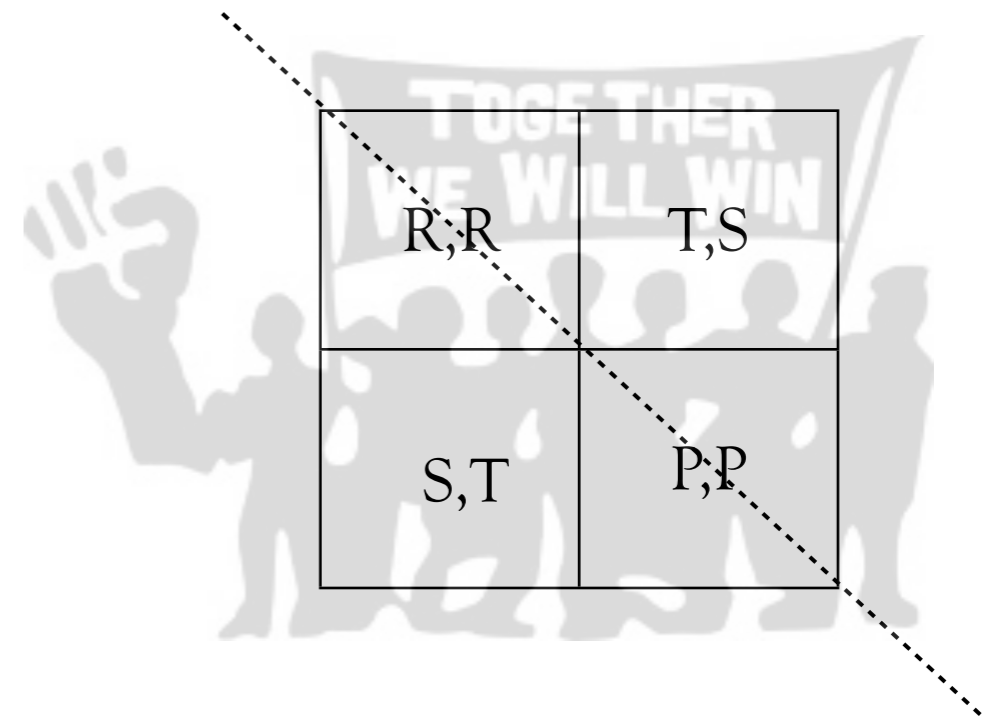


artificially
constraining
choice



Novel Solution

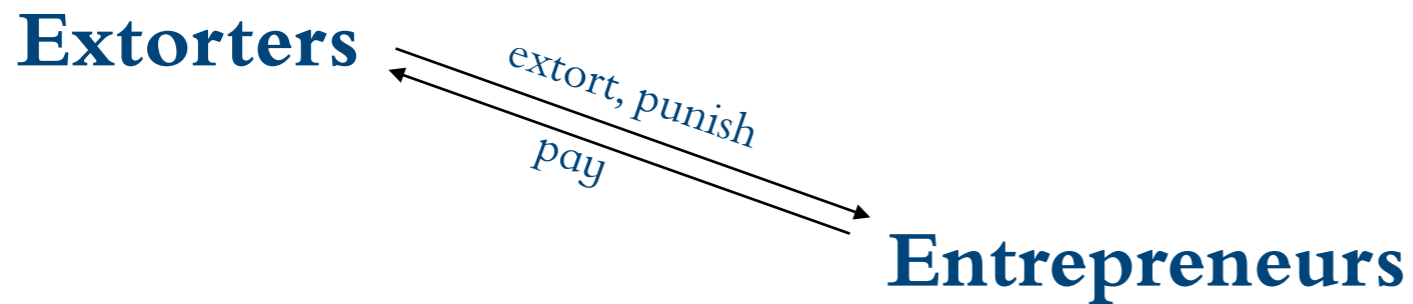
- Changing the Game
- Team Reasoning



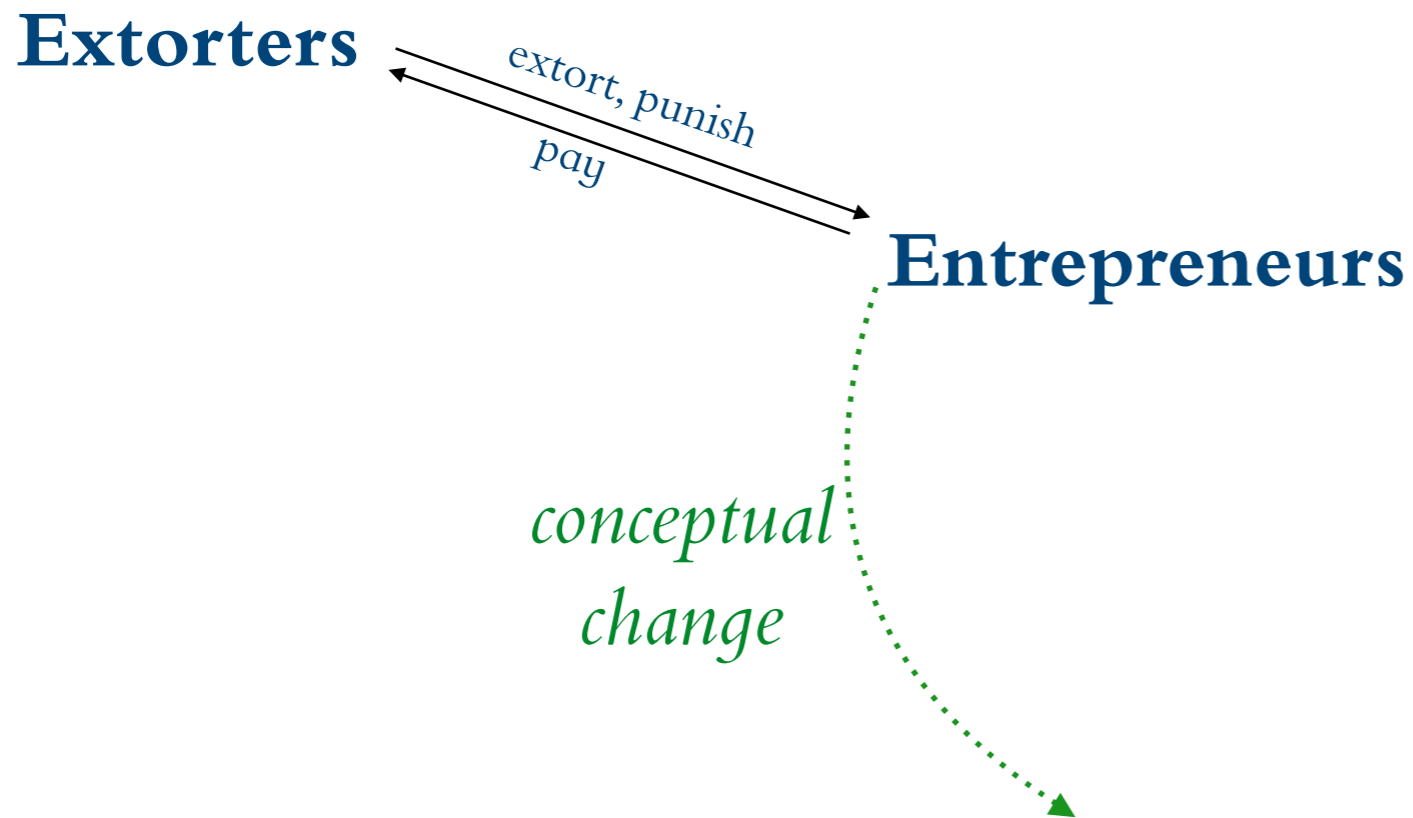
How can looking at a situation differently
change the world?



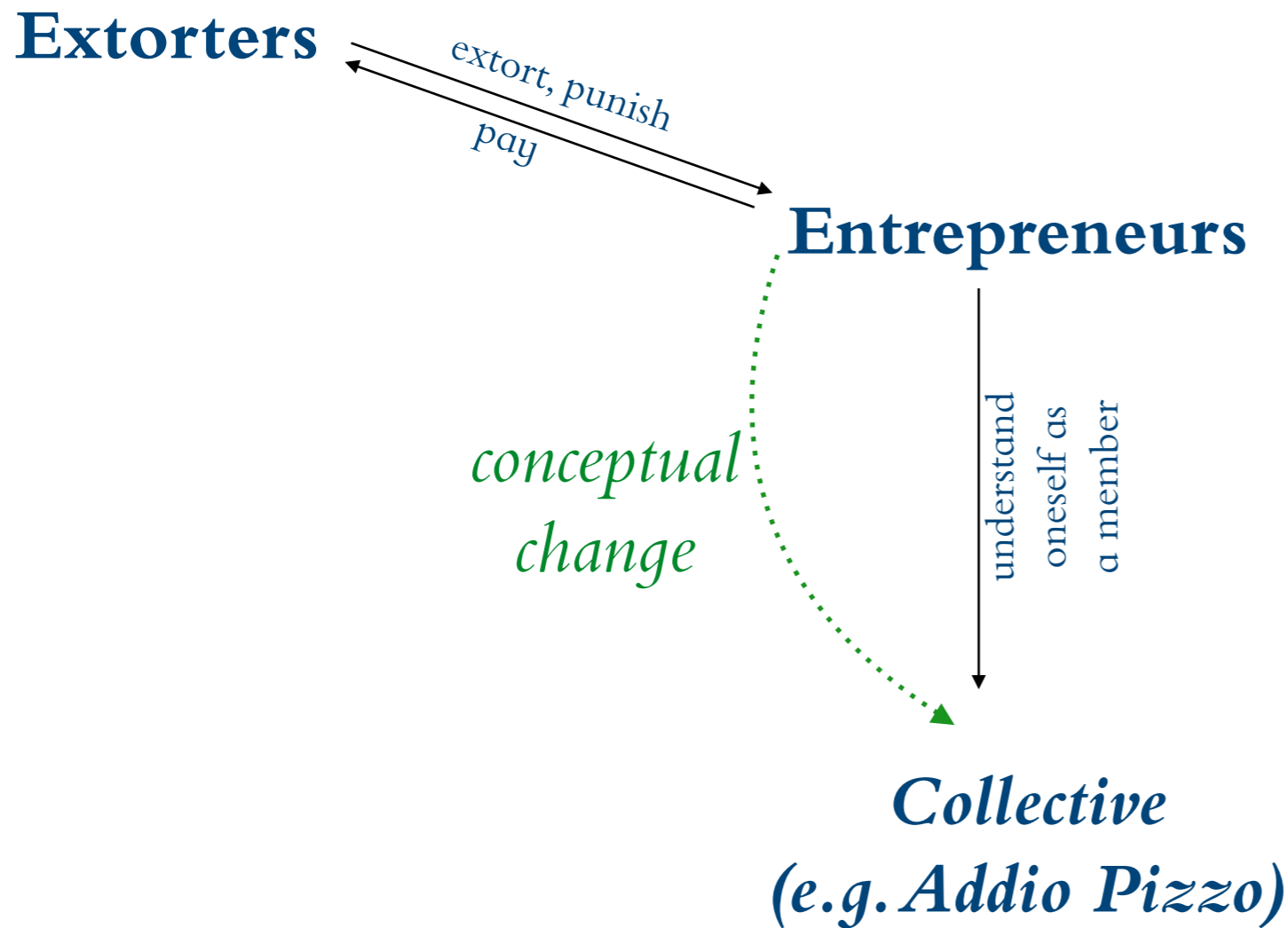
Extending the Model



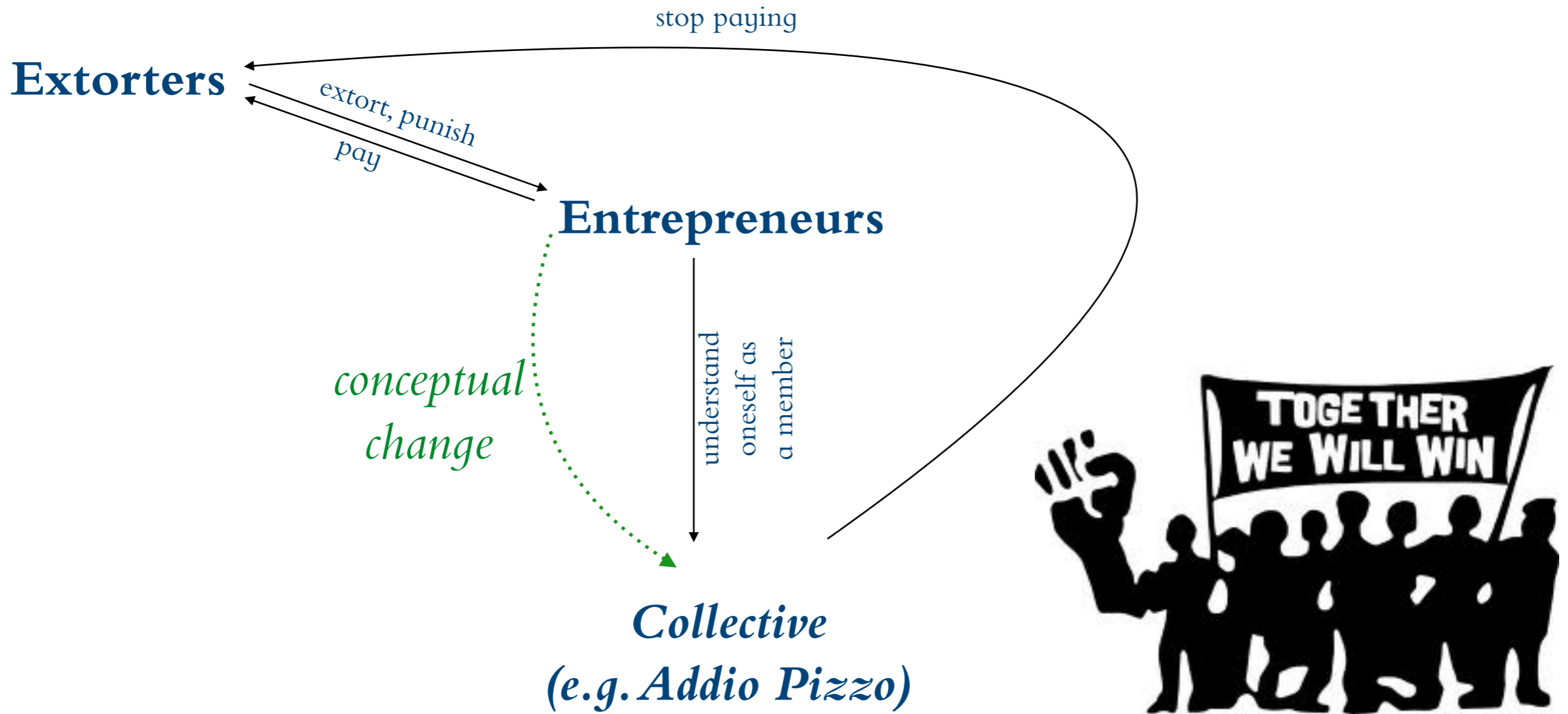
Extending the Model



Extending the Model



Extending the Model

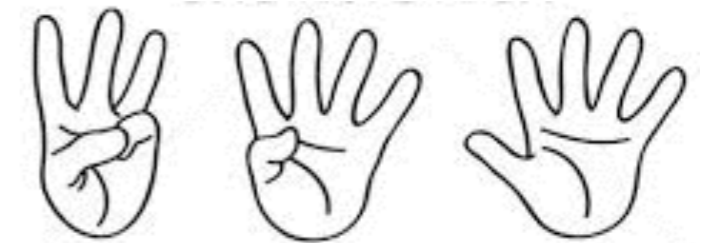


Mafiosi and Fakers

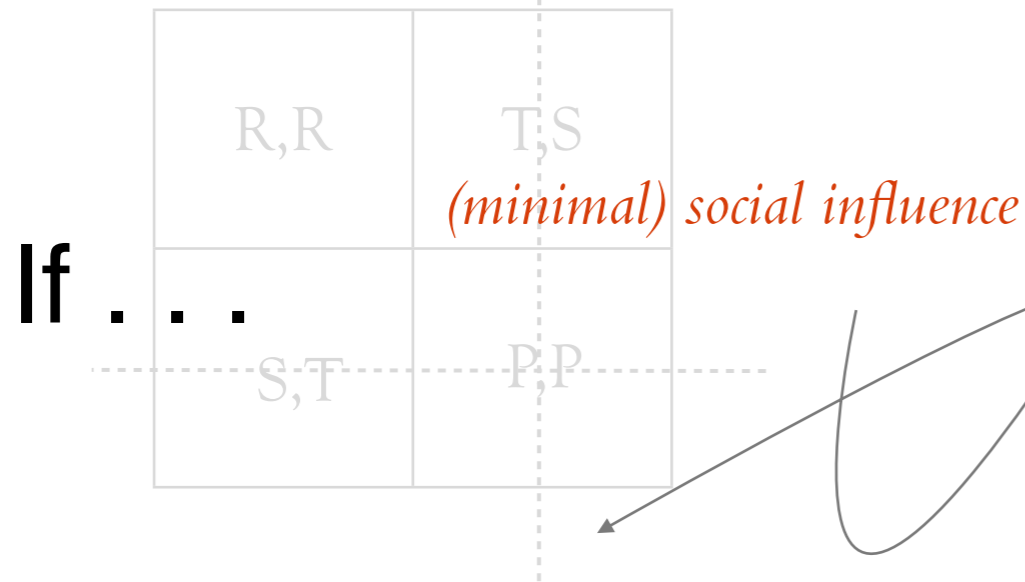


- Entrepreneurs: Collectivists or Individualists
- Extorters: Mafiosi or Fakers
- Mafiosi extort and punish, Fakers only extort, never punish
- Entrepreneurs decide to pay or not depending on experience

- Income, *Pizzo*, Punishment Cost, Damages (kept constant)
- Extorter Radius
- Neighbourhood Radius
- **Group Radius**
- Number of Entrepreneurs
 - **Ratio of Collectivists and Individualists**
- Number of Extorters
 - Ratio of Mafiosi and Fakers



Collective Decision Making



group payment

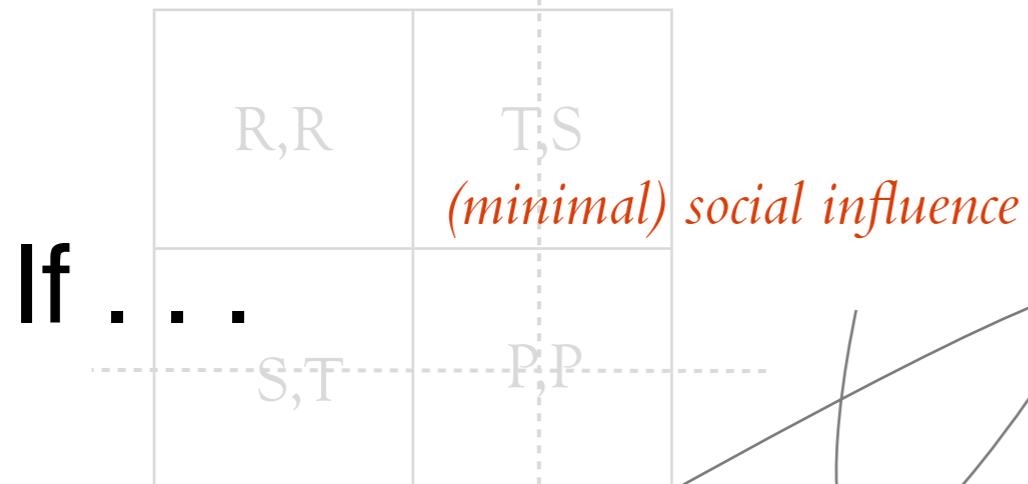
$$\text{punishment-probability} * \text{possible-damage} < \text{group-wealth} + \text{group-pizzo}$$



solidarity component

. . . refuse payment.

Collective Decision Making



group payment

$$\text{punishment-probability} * \text{possible-damage} < \text{group-wealth} + \text{group-pizzo}$$

solidarity component



. . . refuse payment.

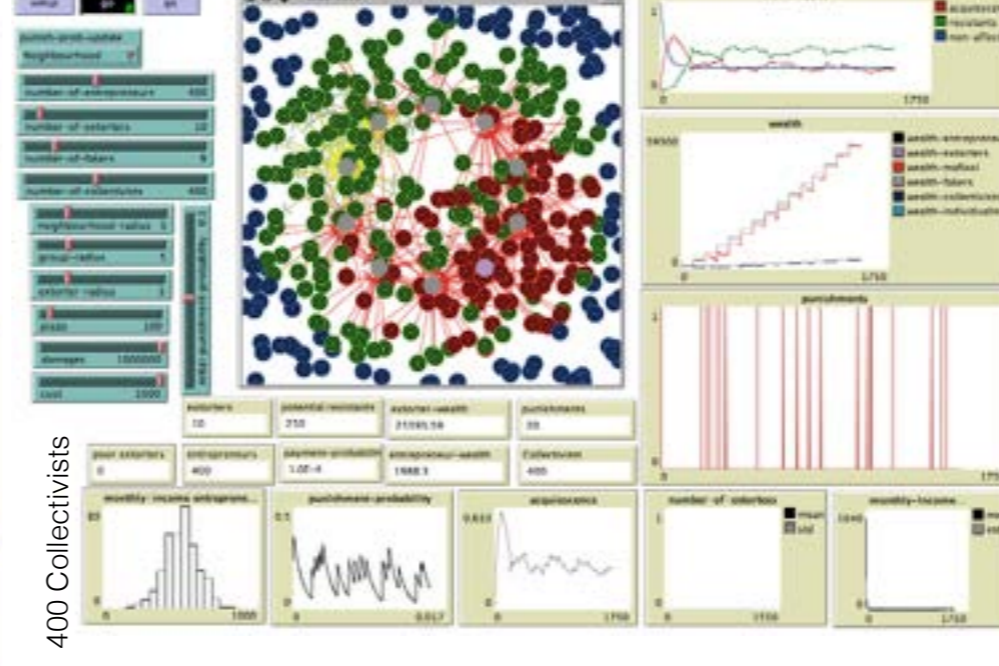
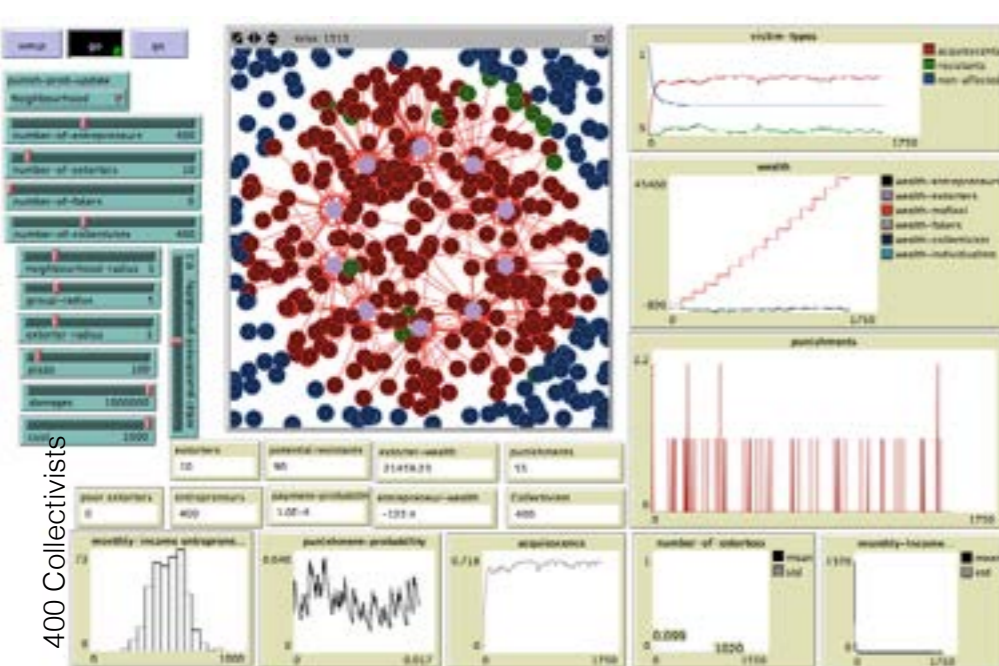
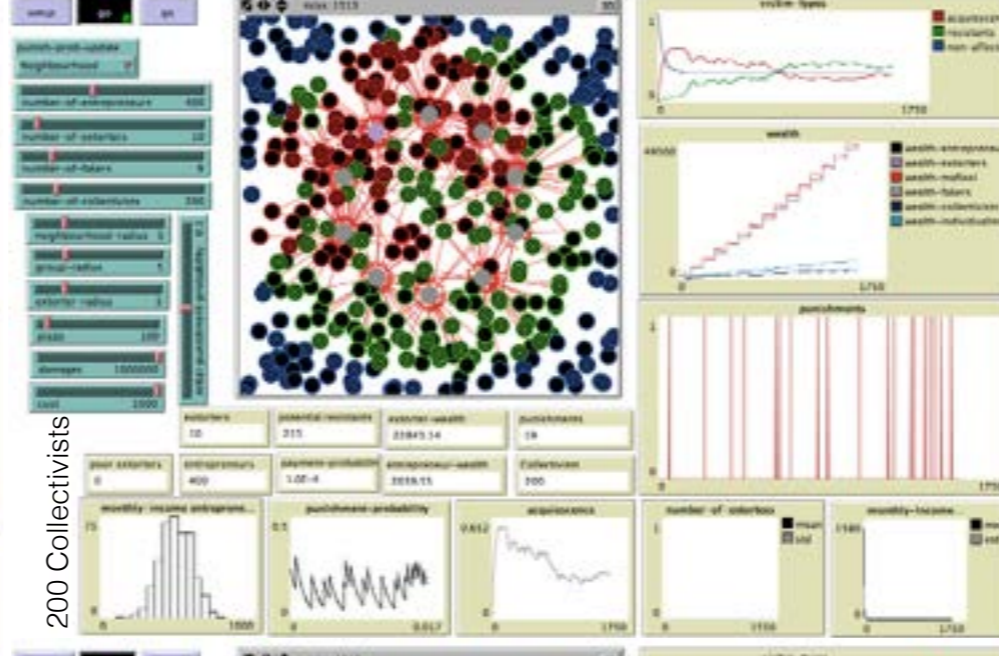
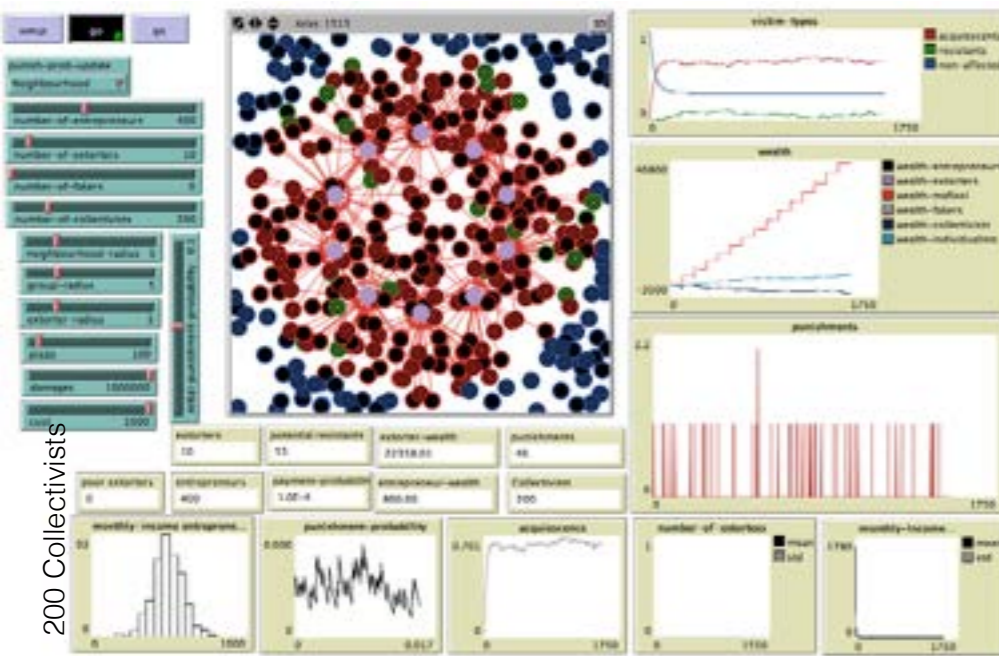
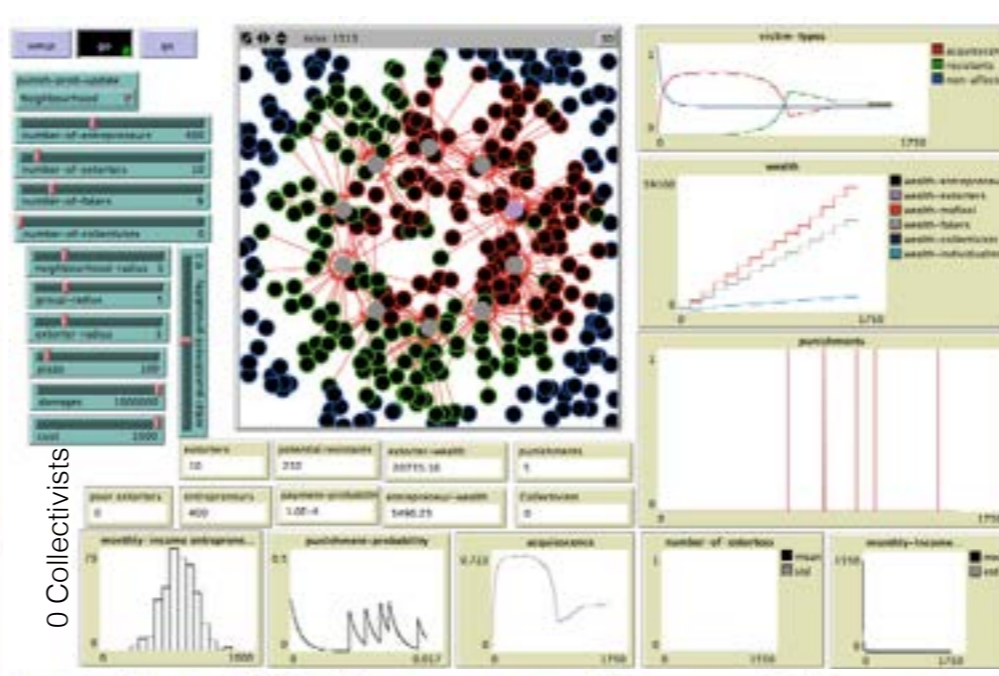
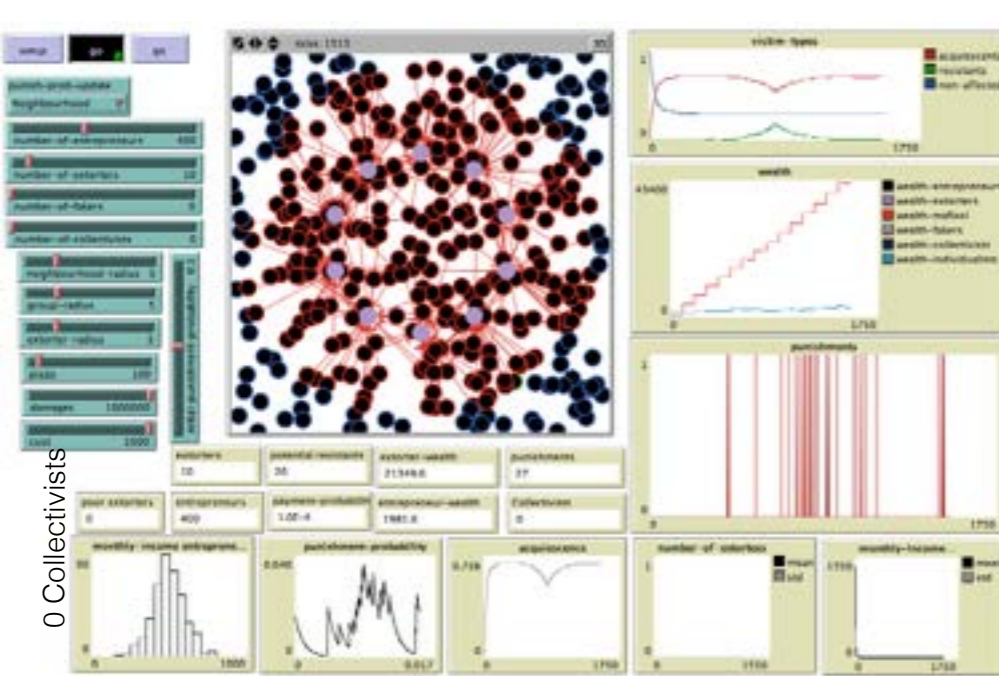
Analysis

- Two Scenarios
 - Pure Mafia over 1, 10 and 20 Extorters
 - Mafia and Fakers over 3:7, 5:5 and 7:3 Ratios
- Number of Collectivists over 0, 50 and 100%
 - Punishments
 - Levels of Resistance

Comparison

- **Pure Scenario**
- collectivists have **little impact** on Mafia
- **punishments increase** (27/46/55)
- **individualists better off than collectivists** in mixed case

- **Mixed Scenario**
- collectivists **detrimental** for Mafia
- punishments **increased** (5/19/20)
- resistance **starts earlier** the more collect
- resistance levels **more consistent**



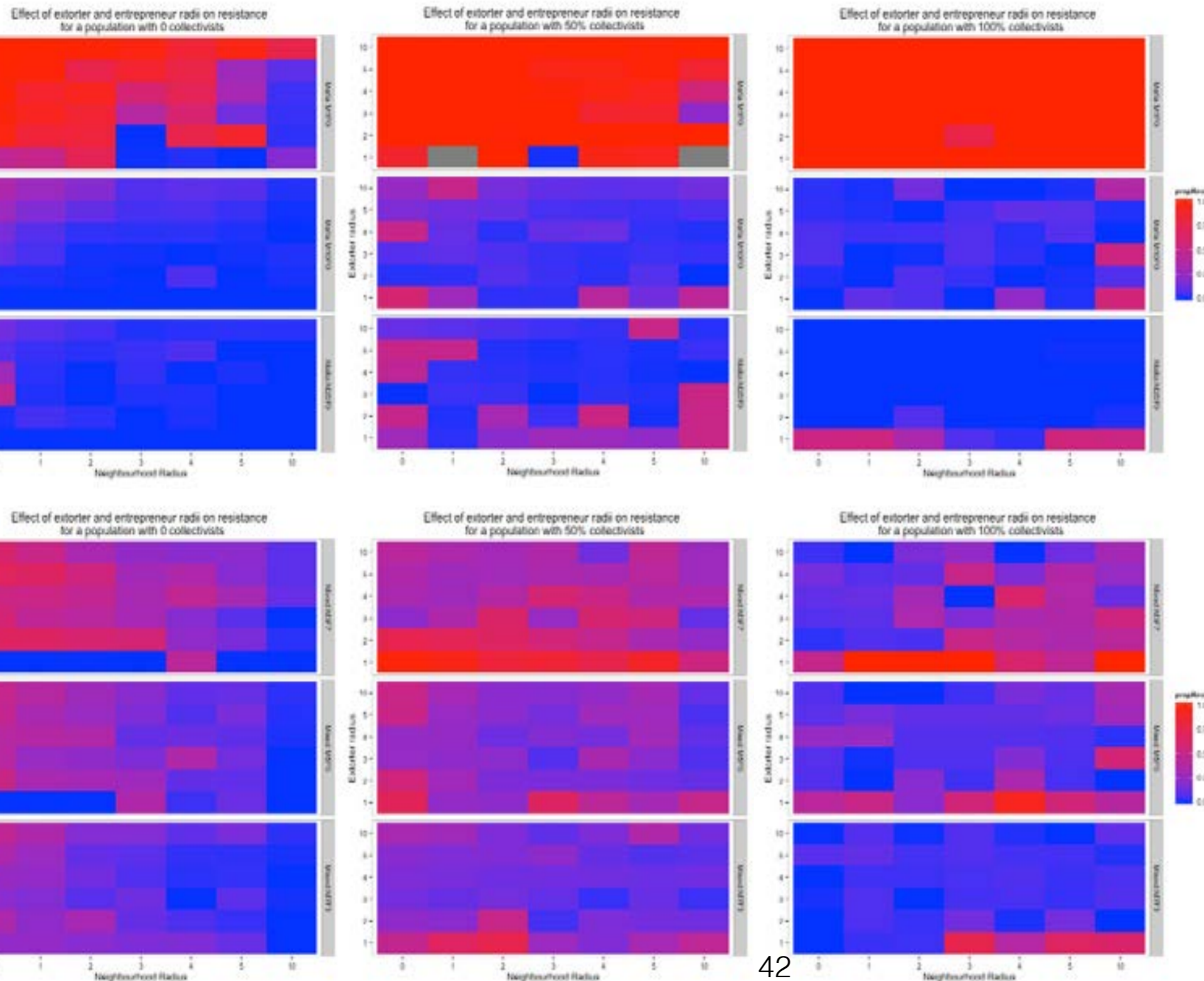
Extorter Radius, Resistance and Levels of Collectivism

• Pure Mafia

- Resistance is high for single Mafioso
- It even increases for increasing collectivity
- More Mafioso reduce the level of resistance dramatically
- Collectivism makes little change

• Mixed Scenario

- fakers increase the levels of resistance
- For this scenario increasing collectivism has a detrimental effect for extorters



Group Radius, Resistance and Levels of Collectivism

Comparison

- **Pure Mafia**

- Collectivism decreases the strong influence of the neighbourhood radius

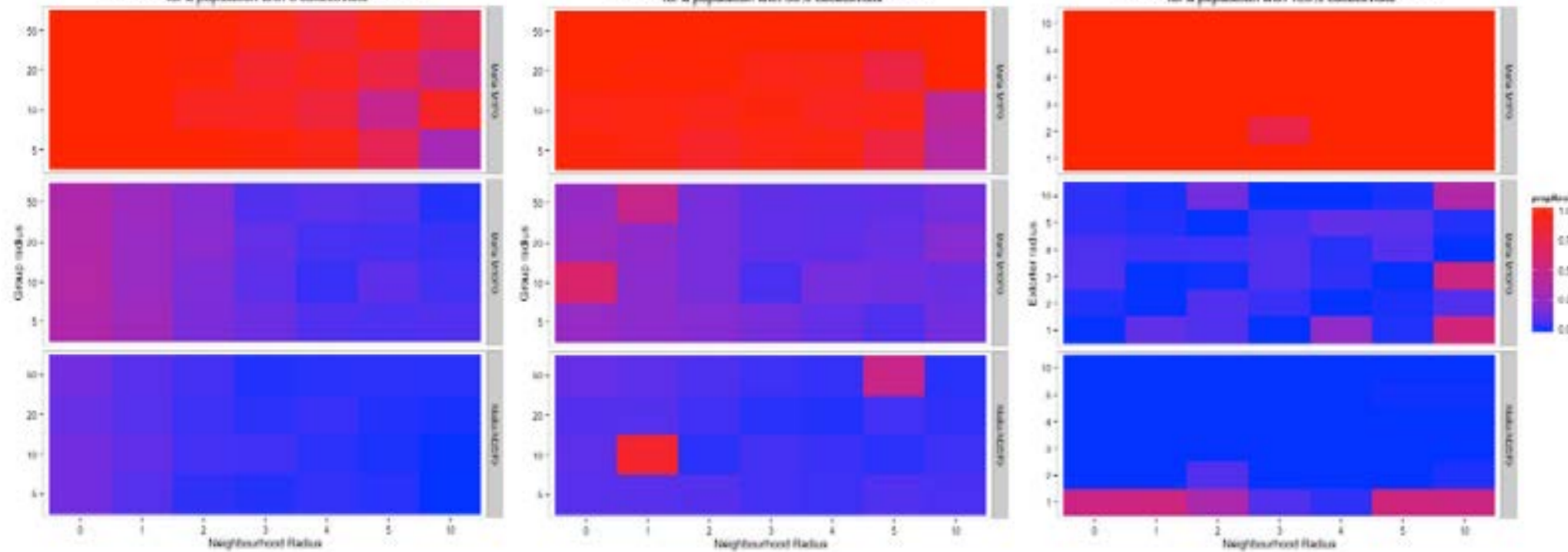
- **Mixed Scenario**

- fakers increase the number of punishments
- Overall levels of punishment still very low

Effect of extorter and entrepreneur radii on resistance for a population with 0 collectivists

Effect of extorter and entrepreneur radii on resistance for a population with 50% collectivists

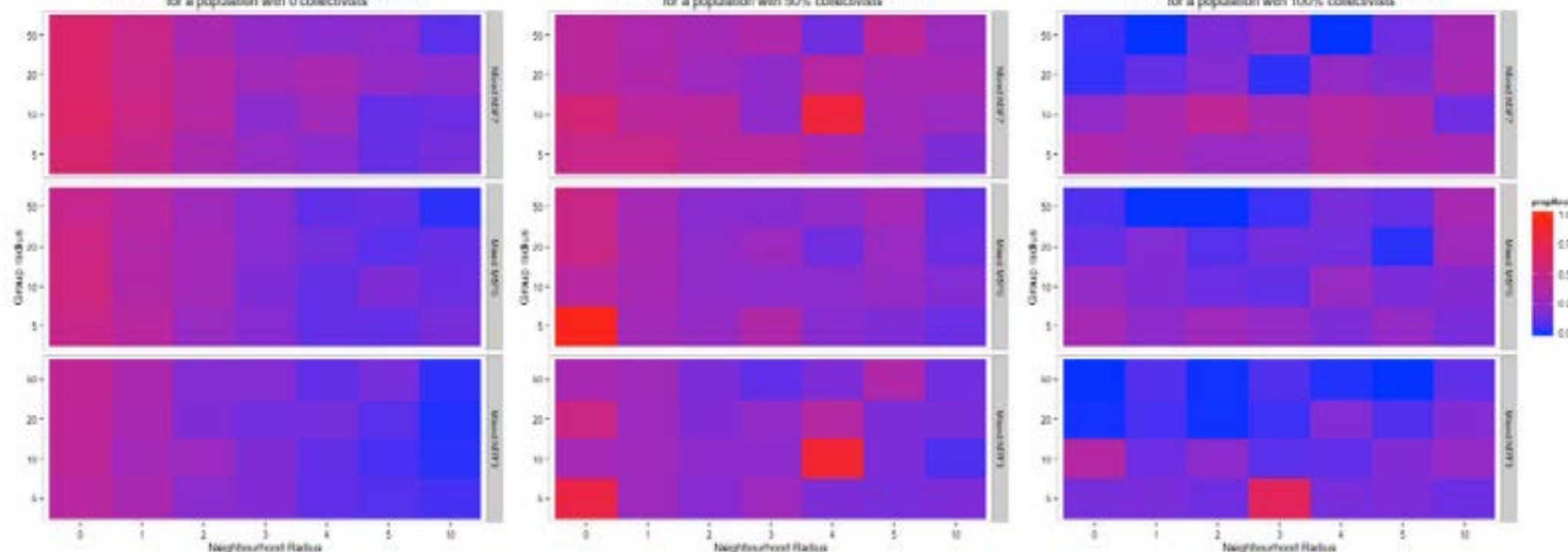
Effect of extorter and entrepreneur radii on resistance for a population with 100% collectivists



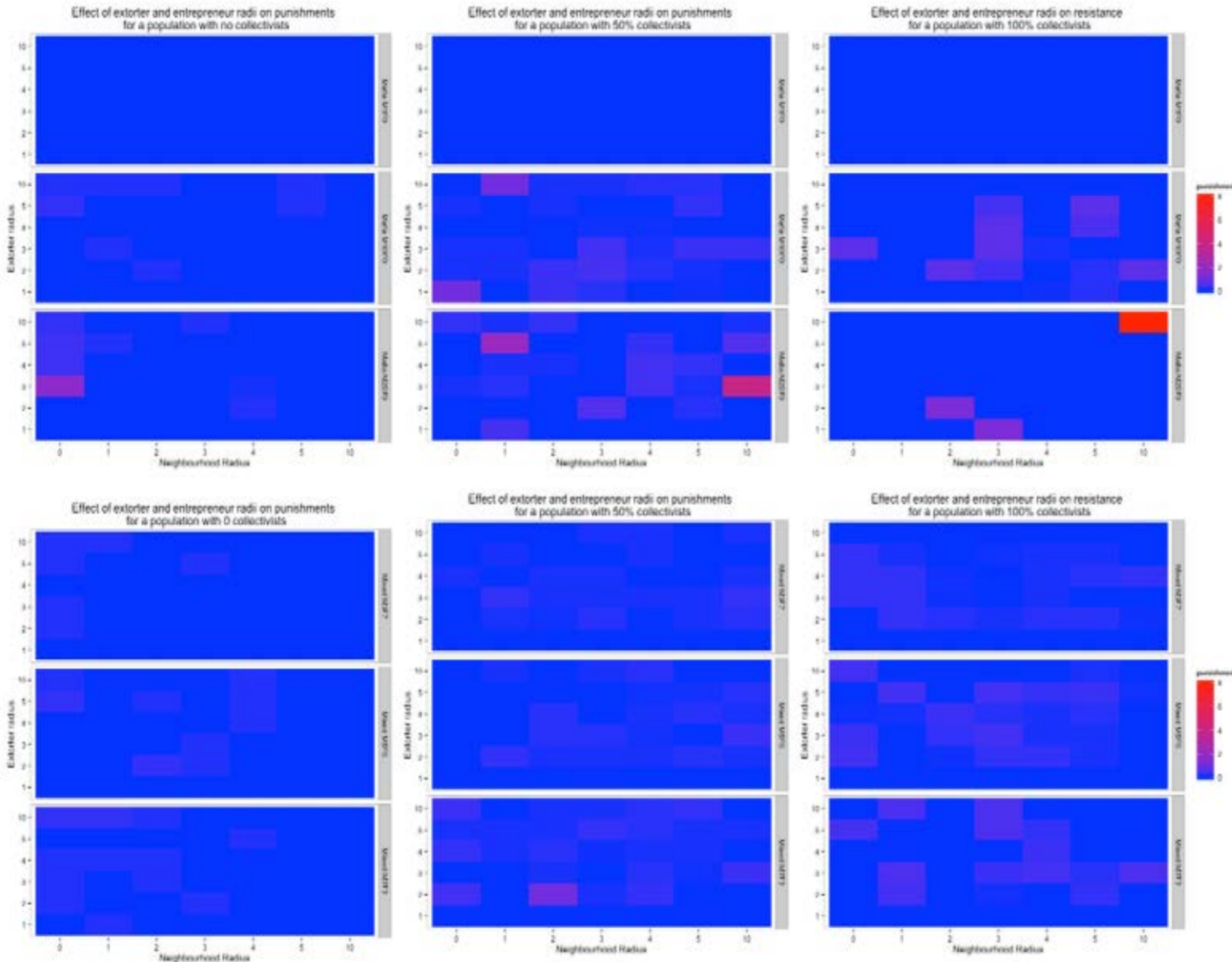
Effect of extorter and entrepreneur radii on resistance for a population with 0 collectivists

Effect of extorter and entrepreneur radii on resistance for a population with 50% collectivists

Effect of extorter and entrepreneur radii on resistance for a population with 100% collectivists



Extorter Radius, Punishments and Levels of Collectivism



• Pure Mafia

- punishments are high for single extorter who cannot rely on other agents.
- punishments decrease for more Mafiosi (reputation sharing)
- punishment also reduces for higher levels of collectivists

• Mixed Scenario

- fakers increase the number of punishments
- Overall levels of punishment still very low

Simulation Narratives

Police

We wanted to see the influence of punishment on acquiescence.

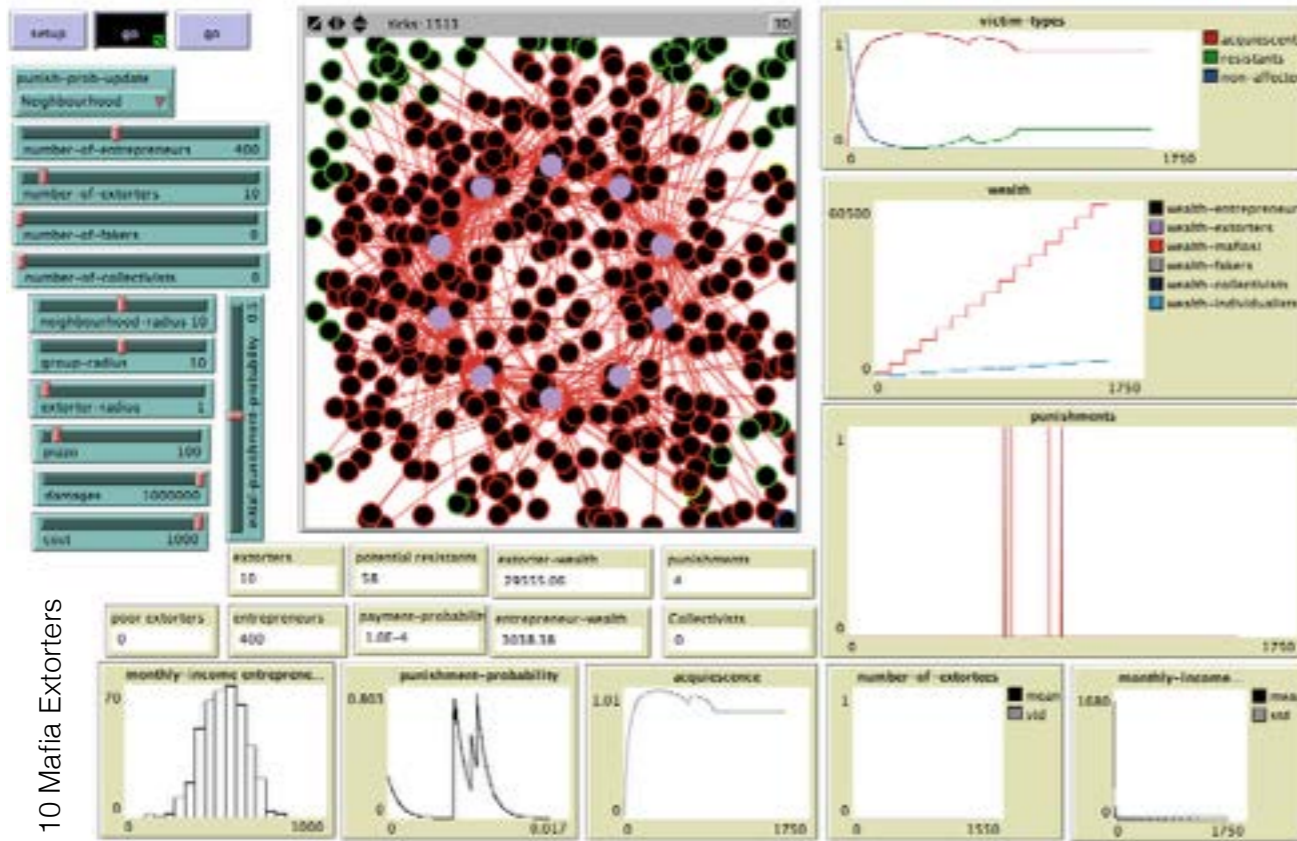
Interpret a decreasing extorter radius as the police effectively moving in and fakers as Mafiosi under close surveillance.



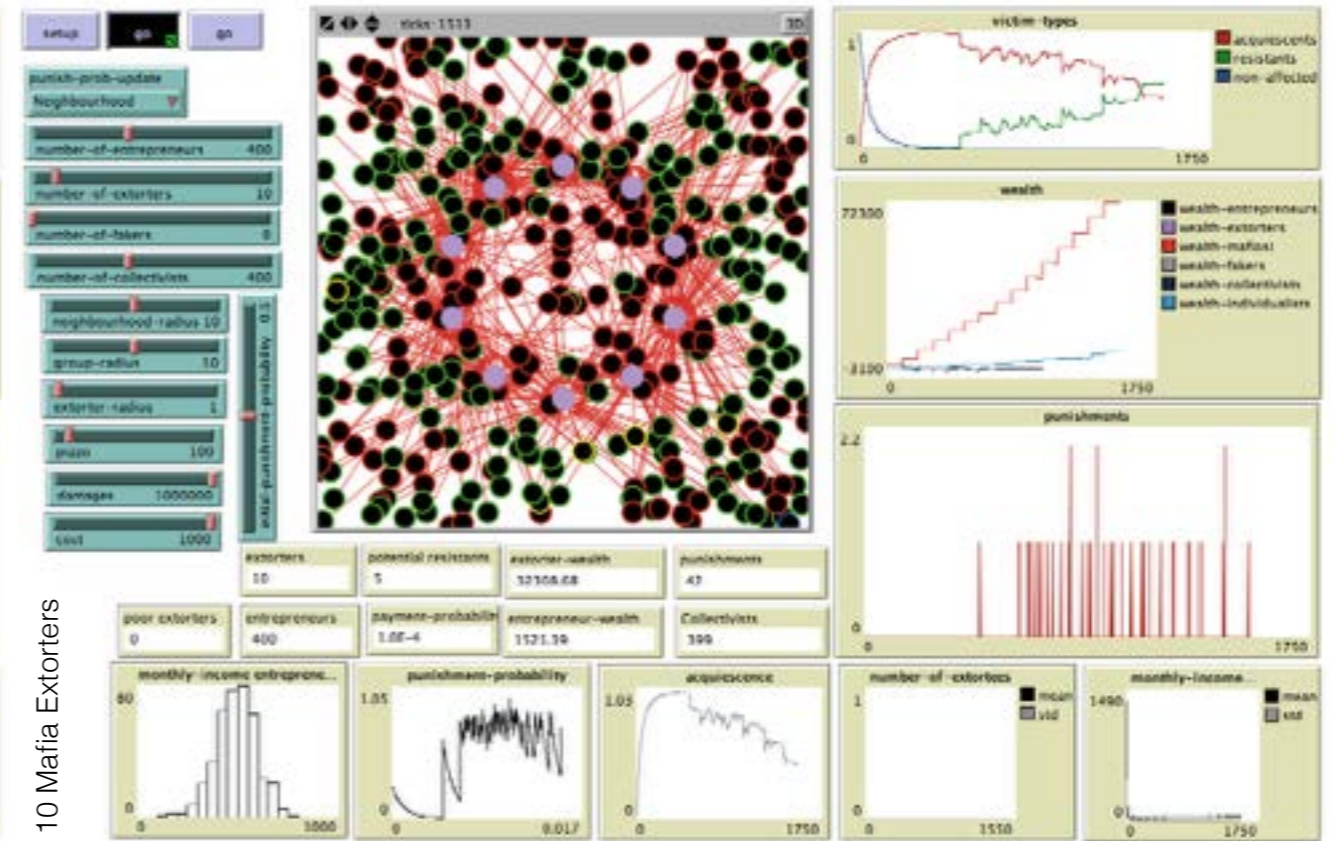
Individualists

Increasing Collectivists

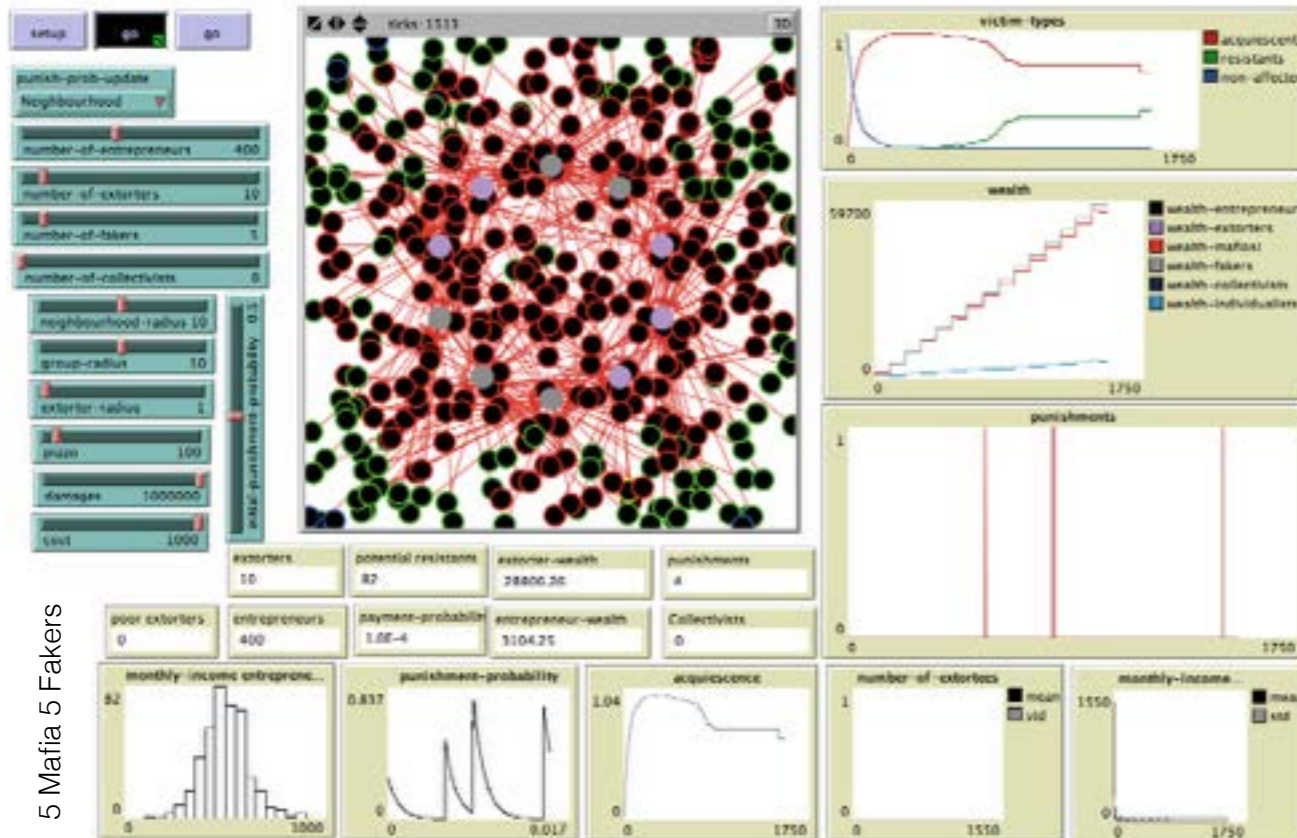
10 Mafia Extorters



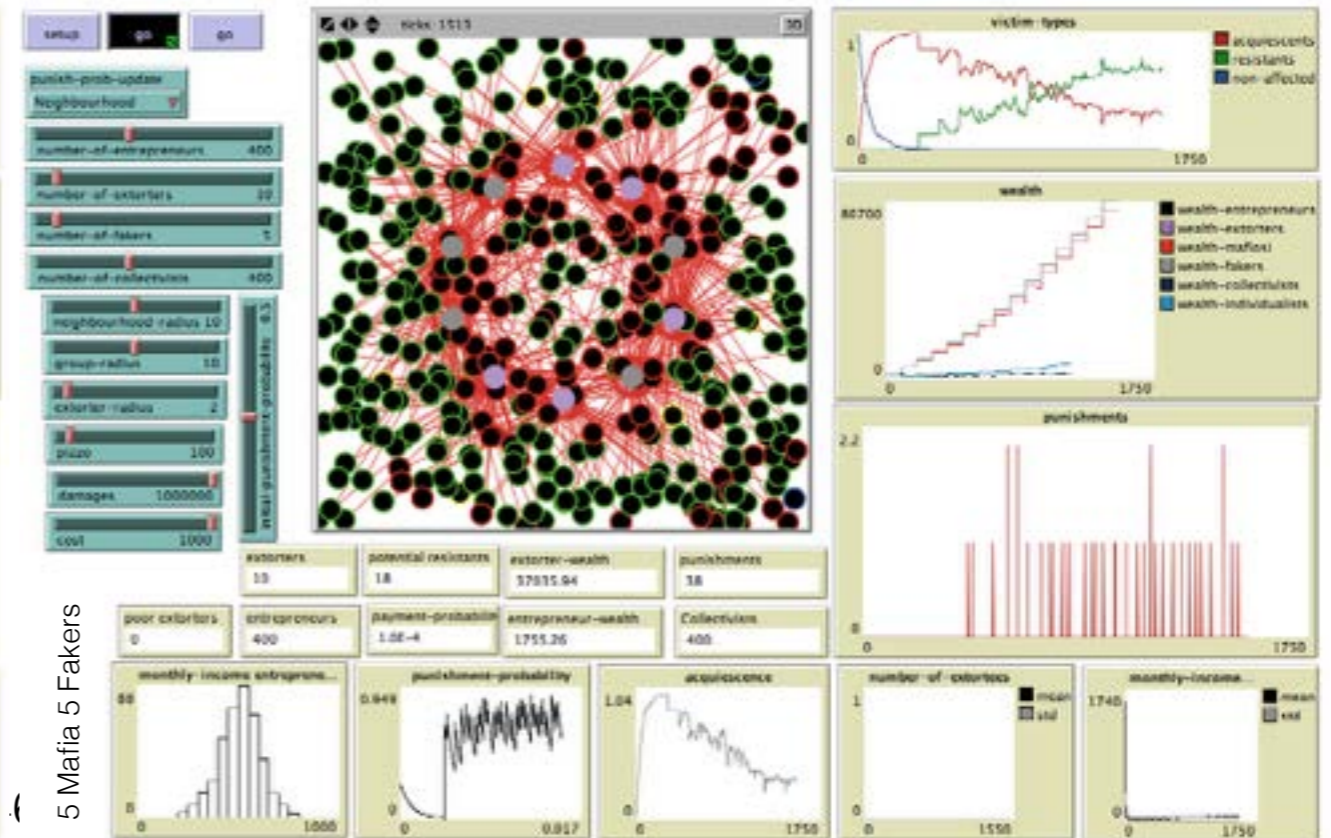
10 Mafia Extorters



5 Mafia 5 Fakers



5 Mafia 5 Fakers



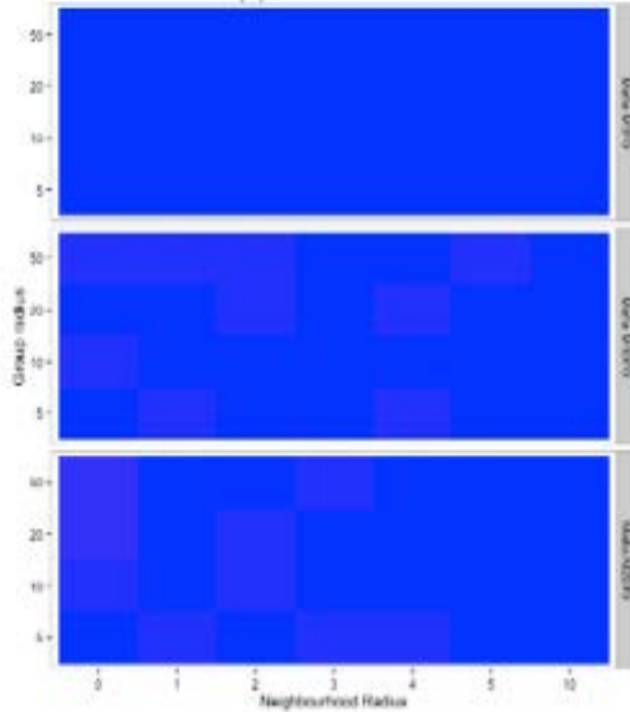
Groups Radius, Punishments and Levels of Collectivism

Comparison

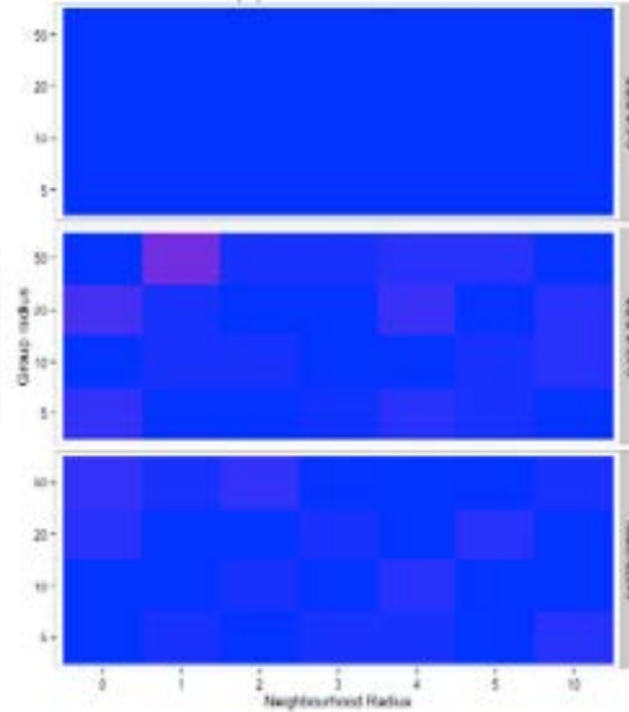
- **Pure Mafia**

- very little change to the levels of punishment
- punishments very very low in all cases

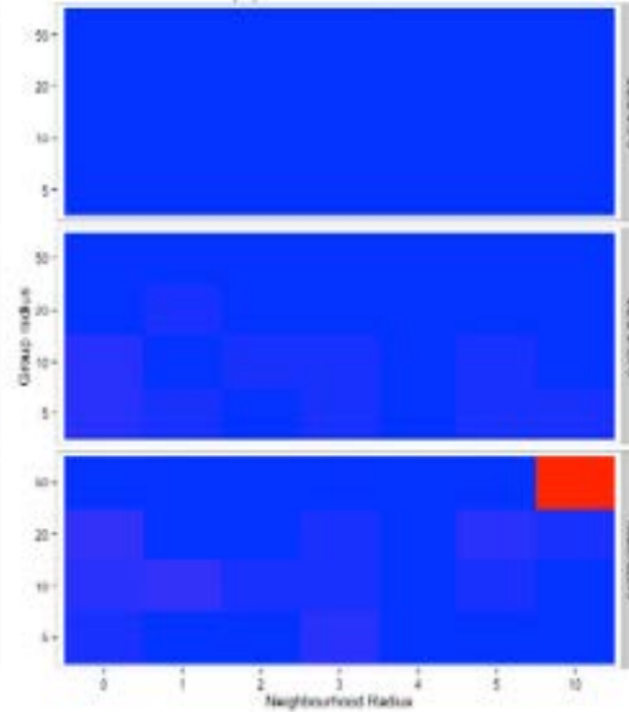
Effect of extorter and entrepreneur radii on punishments for a population with no collectivists



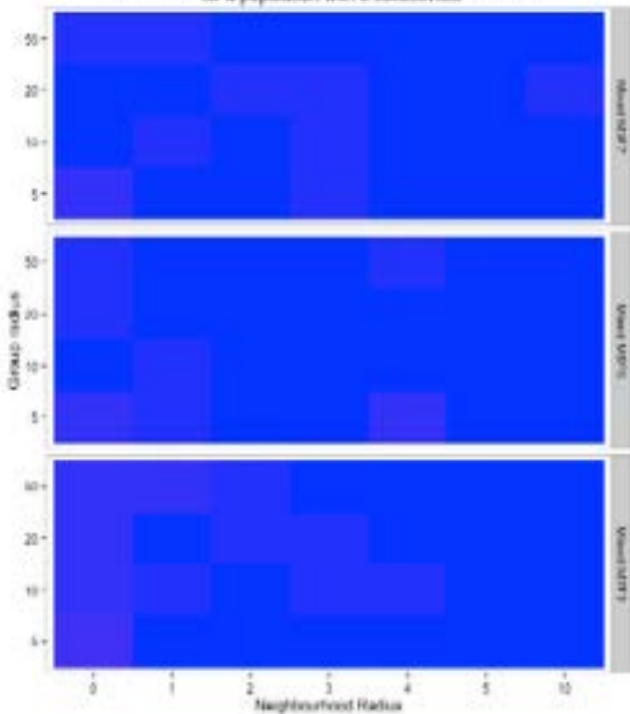
Effect of extorter and entrepreneur radii on punishments for a population with 50% collectivists



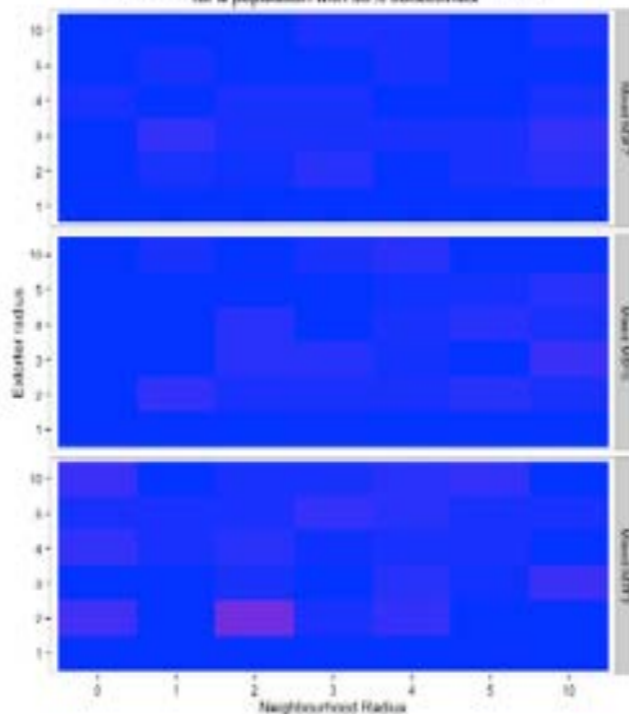
Effect of extorter and entrepreneur radii on resistance for a population with 100% collectivists



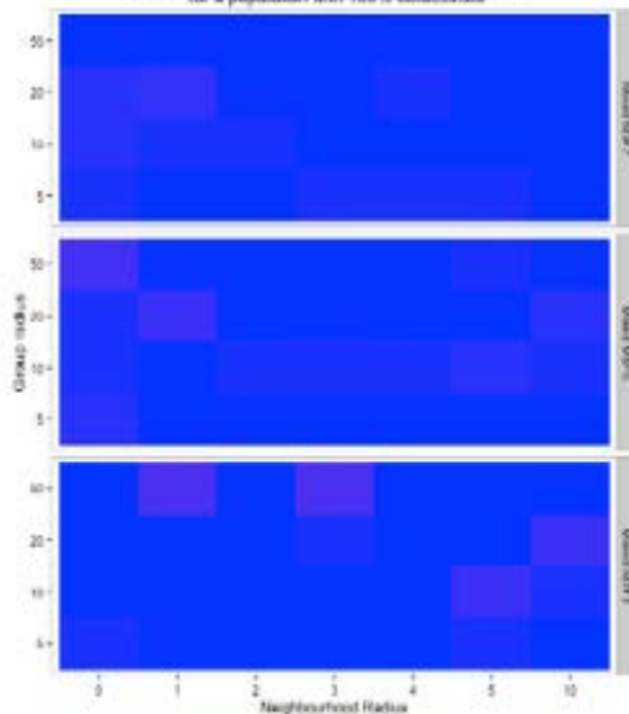
Effect of extorter and entrepreneur radii on punishments for a population with 0 collectivists



Effect of extorter and entrepreneur radii on punishments for a population with 50% collectivists



Effect of extorter and entrepreneur radii on resistance for a population with 100% collectivists



- **Mixed Scenario**

- fakers increase the number of punishments

Conclusions

- Simple models investigating some fundamental dynamics (deterrence/resistance)
- Individualist and collective model
- Pure Mafia and Mafia Faker Scenario
- Collectivists lead to higher resistance in the mixed scenarios
- In pure Mafia scenario it does not really help, however

Future Work

- Social Structures
 - Current networks versus transitive groups
- Dynamic Collectives
 - people changing their disposition depending on circumstances
- Other implementations of collective decision making
 - Currently very simple implementation - many others possible
- Generalise the model of “Collective Decision Making”



Thanks!