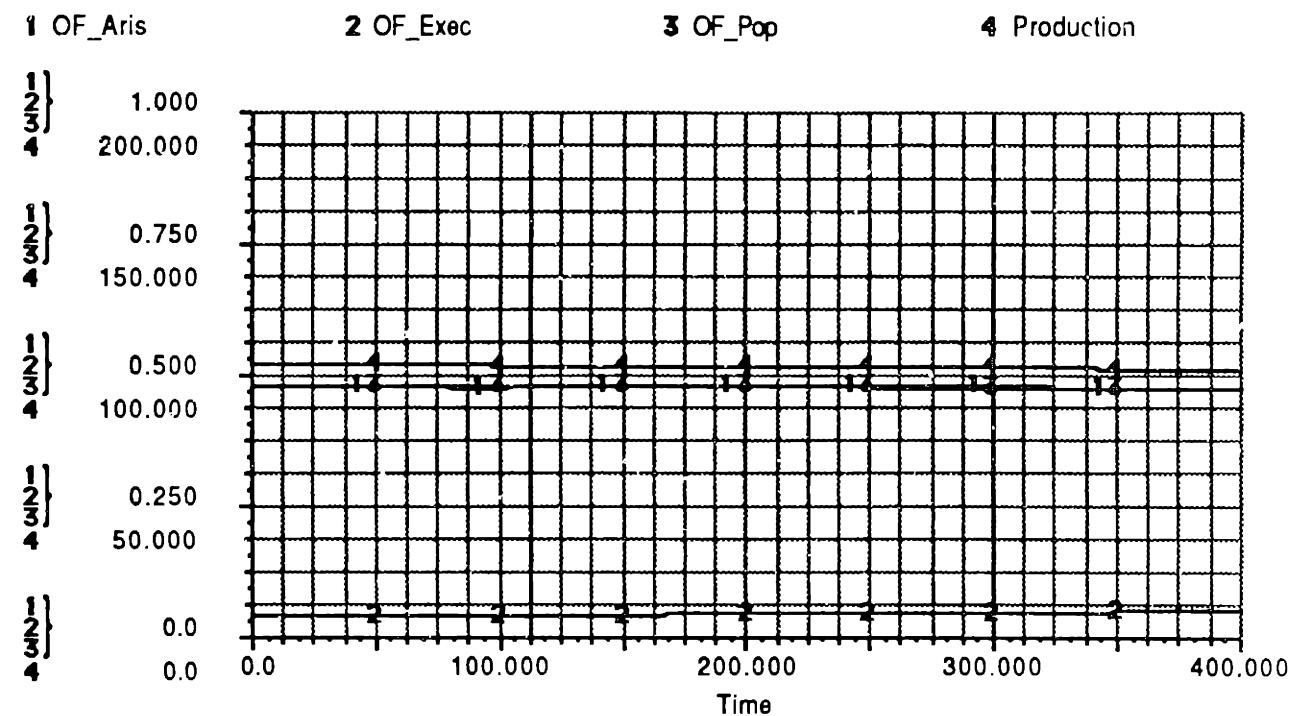
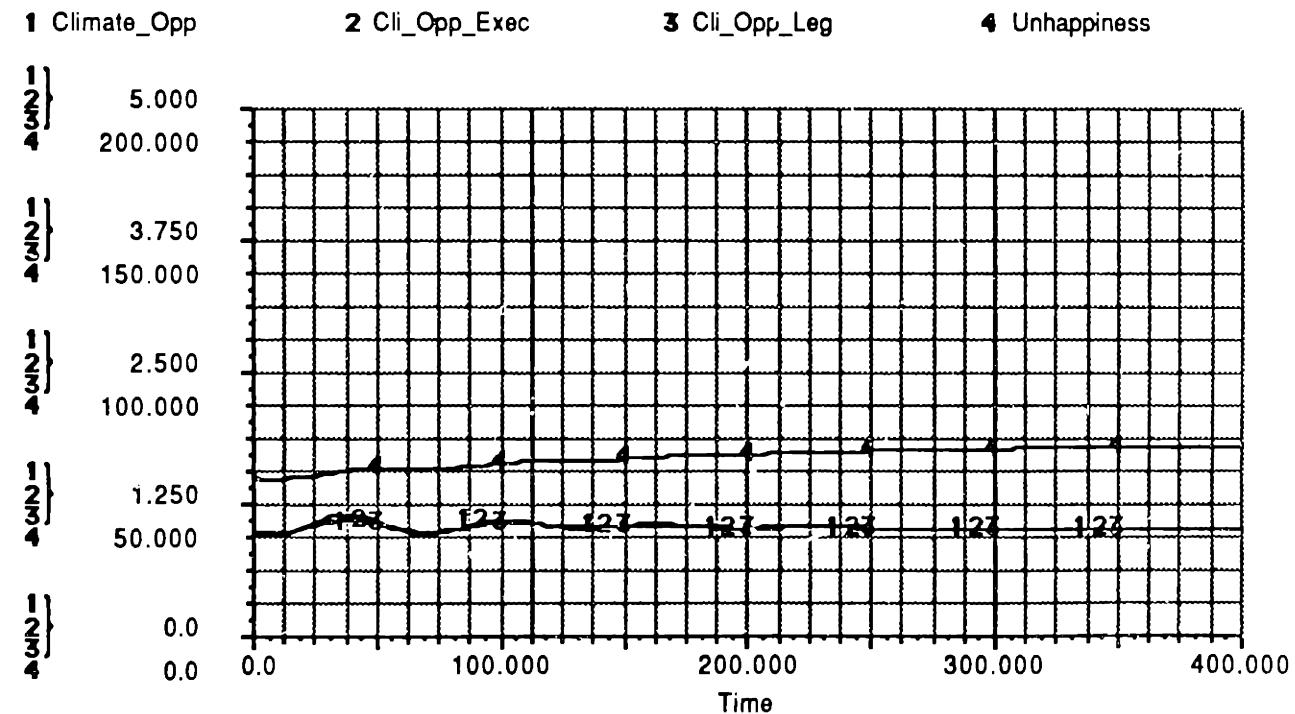


Appendix A: Graphic Output from Scenarios

Graph 79



Graph 80



Appendix B: Description of Model Structure

B.1 Class Conflict and Popular Norms

Popular Desired Freedom (Pop_Des_Free)

The value of the level Pop_Des_Free represents the norms of the populace concerning the "just" level of civil liberties which should ideally be maintained. It is measured in intensive units of freedom (civil liberties/person/month). Freedom is scaled from 0-100. A level of freedom=100 represents chaos, while freedom= 0 represents mechanism. At equilibrium, the state variable Freedom is set equal to 50 and Pop_Des_Free is 65.

There are a number of factors which affect the rate of change of Pop_Des_Free. Political protest (Pol_Protest) tends to make the community more aware of injustice. Public Opposition to the Government (Opp_Gov) and the Exec(Opp_Exec) can elevate radicals to the forefront of the popular movement, polarizing the community and forcing the population to take a more extreme stance. Traditional values concerning freedom (Trad_Pop_Des_Free) serve as an anchor, representing the influence of the elder spokesmen in the community (who have obviously accepted the status quo--otherwise they would never have come to be elder spokesmen). These traditional values may also be derived from other sources--institutional influences, modes of production, natural conditions, social history. Even though traditional values change only slowly, they do nevertheless change. In the model traditional desired freedom is influenced both by current values (Pop_Des_Free) and unchanging environmental conditions (EEOPDF: Effect of Environment on Political Desired Freedom).

Machiavelli also suggests that religion has a large effect on the actions of the populace. In the model this is accomplished by Rel_Infl. In another section religious desires are represented, and as popular norms begin to deviate from religious desires, religious influence will become proportionally greater in an attempt to curtail this trend. Finally, we must also consider the ability of the Executive to influence popular opinion through "propaganda" (Prop_Infl). The effects actually modeled in Prop_Infl actually consist of a number of processes in addition to what is traditionally thought of as propaganda. These may include executive support for those who agree with his policies, conscription for those who don't agree, removal and/or silencing of dissidents, etc.

By comparing the level of popular desired freedom (Pop_Des_Free) to the government's

Appendix B: Description of Model Structure

policy concerning freedom (Gov_Pol_Free) we are able to determine the discrepancy between the populace's desired state and actual state. This is known as the popular political discontent (P_P_Discontent). All things being equal, a higher degree of discontent leads to more political protest (Pol_Protest) in order to bring about more favorable conditions by amending the laws. However, the ability of the populace to protest "unfair" measures is limited by the level of political freedom (Pol_Freedom) and economic welfare (Eco_Welfare). The effects of these two state variables are represented by the table functions EPF_Protest (Effect of Political Freedom on Protest)(Figure B.1.2) and EEW_Protest (Effect of Economic Welfare on Protest)(Figure B.1.3). When levels of economic welfare and political freedom are high, the population can protest freely. However, when freedom=0 in the society, protest is by definition impossible. Likewise, when the economic welfare of the populace is low, it is much more difficult to protest government policies. (NOTE: It is quite likely that lack of economic welfare, i.e. hunger, could be a motivation for protest. This causal loop is accounted for in the formulation of popular economic discontent and is not to be confused with the effect of a low level of economic welfare on protest.)

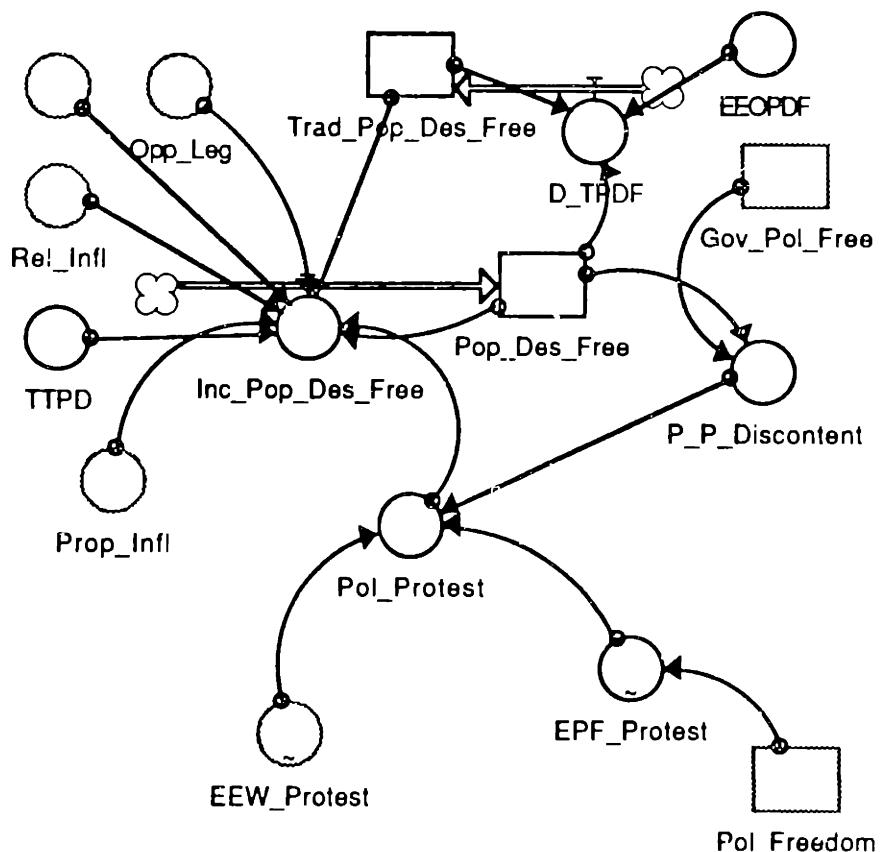


Figure B.1.1: Popular Desired Freedom

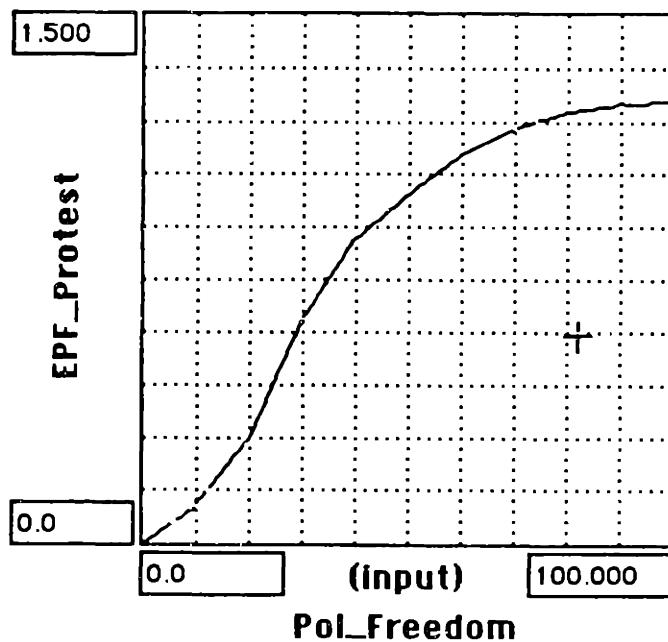


Figure B.1.2: Effect of Political Freedom on Protest

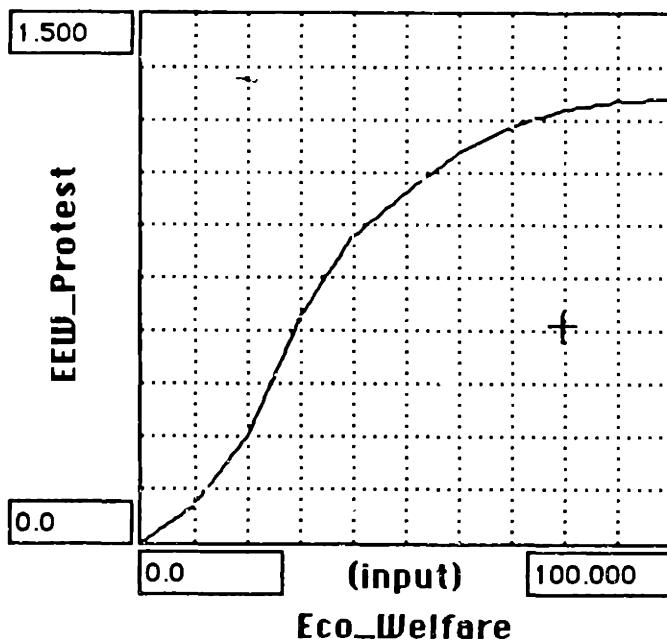


Figure B.1.3: Effect of Economic Welfare on Protest

Aristocratic Desired Freedom (Aris_Des_Free)

This level is also measured in units of freedom. Machiavelli claims that the aristocracy and populace are engaged in a continual class struggle. In the model this is reflected by the low initial value of aristocratic desired freedom (Aris_Des_Free) in the model. The value of Aris_Des_Free reflects the aristocrats' judgement of the proper level of civil liberties for the populace and is set