Now, if we do some simple math, we see that:

$$welfare = output / person / month$$
$$= (ouput/1000) / (person/1000) /month$$
$$= perceived \ aristocratic \ output / aristocrat / month$$
$$= aristocratic \ welfare$$
$$= welfare$$

Thus, we see that these two units are comparable. In the model, Aris_Des_Eco_Wel is initialized equal to 65.

Religious Effort (Rel_Effort)

This variable represents the role of the church during the Renaissance as a stabilizing influence on the population. Religious effort (Rel_Effort) is a weighting fraction used to determine the strength of religious influence (Rel_Infl) upon popular norms (Pop_Des_Free, Pop_Des_Eco_Wel). Its outflow is a normal first order decay, while its inflow is formulated as a normal rat~ imes the effect of opposition to the status quo (N_I_R_E and EORE). As the lower class begins to upset the status quo, the religious institution is apt to step up its efforts to calm the people, serving as a tool for the aristocracy and executive to control popular interests. We see this tendency in the table function EORE (Effect of Opposition on Religious Effort) (Figure B.1.11).

Religious influence (Rel_infl) is measured in composite units (both economic and political dissonance--welfare and freedom) and is equal to the difference between religious norms (Rel_Des_Free, Rel_Des_Eco_Wel) and popular norms (Pop_Des_Eco_Wel, Pop_Des_Free) times the level of religious effort.
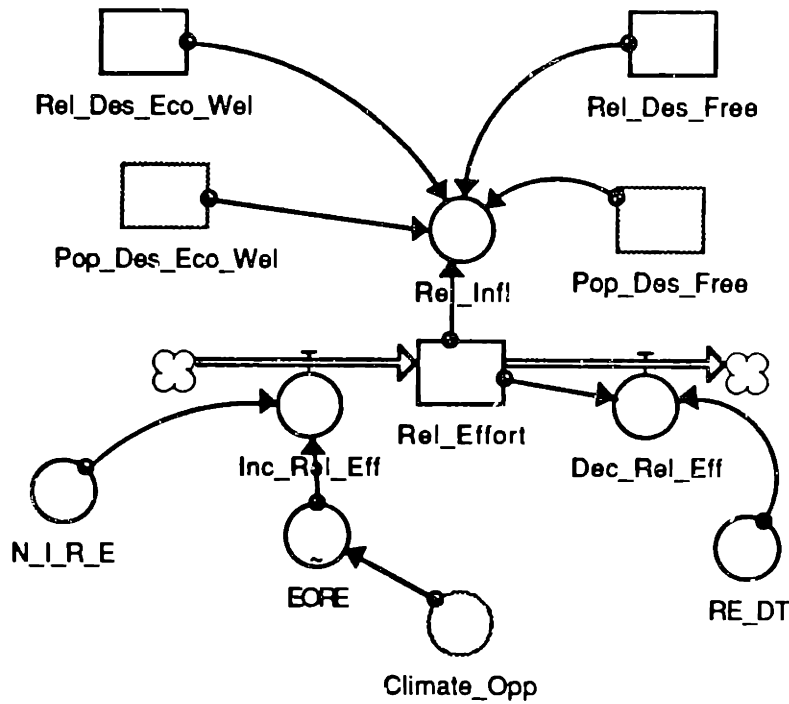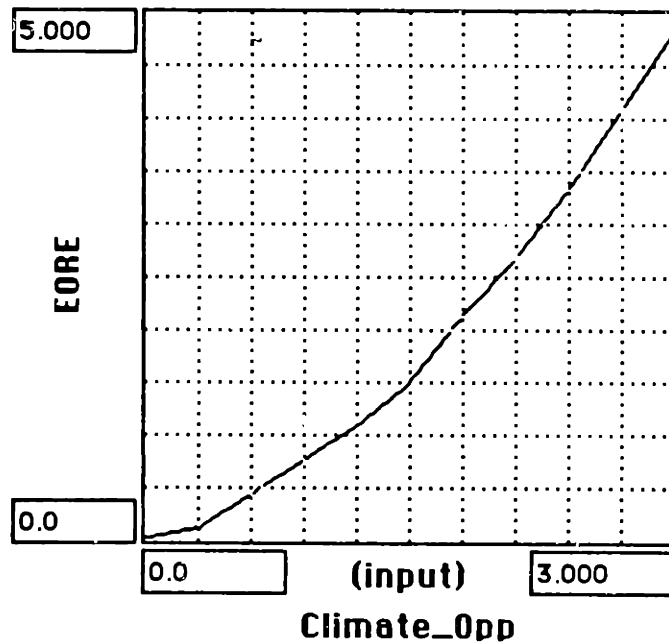
Figure B.1.10: Religious Effort

Figure B.1.11: The Effect of Opposition on Religious Effort

B.2 The Legislative Sector

Political Law (Pol_Law)

The law reflects society's consensus concerning the norms which should be implemented by

the government. Political Law (Pol_Law) is measured in units of freedom and begins with an initial value of 50. If the civil liberties and guidelines which political law consists of were executed both faithfully and perfectly by the executive, they would result (in equilibrium) in a level of Pol_Freedom=Pol_Law.

Political Legislation is the rate of change in Political Law. All three political actors—the populace, the aristocrats, and the executive—have some influence over legislation (Pop_Leg_Infl, Aris_Leg_Infl, Exec_Leg_Infl, respectively). These influences describe the relative weights of each of these groups within the legislature and thus sum to one. Initially they are all set equal at 1/3. Political Protest (Pol_Protest) will almost always have as it's purpose the increase of the level of freedom mandated by political law (Pol_Law) and is thus positive. Aristocratic political discontent is usually indicative of a desire to reduce the level of freedom—it will thus be negative. Executive political discontent may be either negative or positive depending on the current state of freedom and the executive's personal political desires (Exec_Des_Free). The current rate of political legislation is arrived at by multiplying the discrepancy of each faction (protest for populace, discontent for executive/aristocrats) by its respective legislative influence.
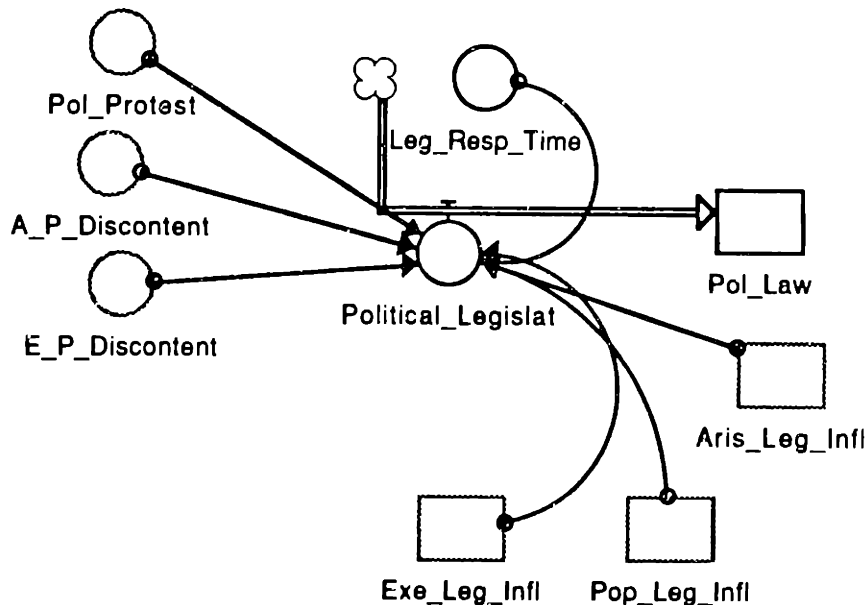

Figure B.2.1: Political Law

Economic Law (Economic_Law)

Economic law is measured in units of welfare and is with respect to the populace. If these laws were implemented faithfully by the executive, output fraction of production allocated to the populace would be manipulated in an attempt to raise economic welfare to the level mandated by the

law. Unlike the level of freedom, there is no certainty that government goals will ever be reached--it is possible that total production is not high enough to provide the desired level of economic welfare.

Economic legislation (Eco_Legislation) is the rate of change in economic law. Its formulation is identical to that of Pol_Legislation. The desires of the political factions for change are weighted by their respective legislative influences to arrive at the current legislation.
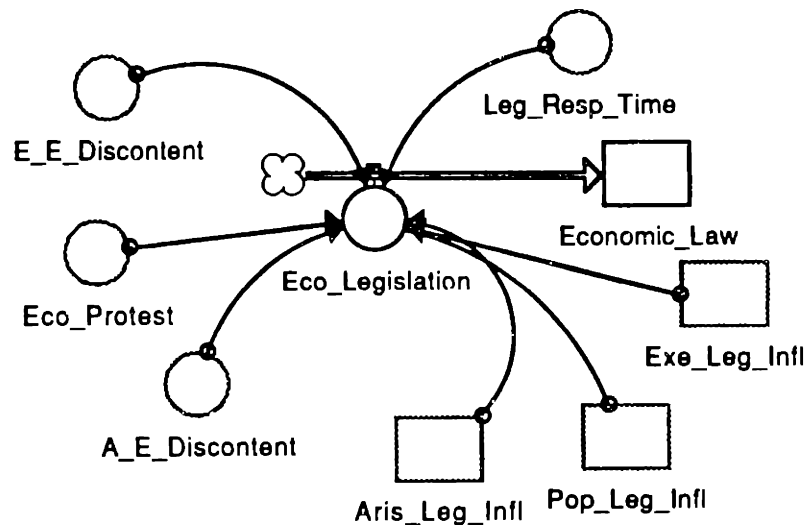

Figure B.2.2: Economic Law

Legislative Influence (Exec_Leg_Infl, Pop_Leg_Infl, Aris_Leg_Infl)

Each political faction has some degree of influence over the legislature. The distribution of this influence shifts as representatives and their particular views are removed, replaced, and retired. The sum of this triad of influences must always be equal to one, and of course no influence may become negative. Initially, all three legislative influences are set equal to 1/3.

The rate of change of executive legislative influence (D_PELI, D_AELI) is equal to the difference between the rate at which the executive is able to seize power (Exec_Seiz_LI) and the rate at which the populace or the aristocrats are able to seize power (Pop_Seiz_LI, Aris_Seiz_LI). The rate at which the executive is able to seize legislative influence (Exec_Seiz_LI) is equal to a normal rate of influence seizure (N_Seiz_Infl) times the level of executive competence (Exec_Comp) times the level of executive power (Exec_Power) times EEPRLI. EEPRLI (Effect of Executive Power Ratio on Legislative Influence) is a table function that reflects the difficulty of maintaining high legislative influence without a high level executive power. EEPRLI reflects the fact that executive power and executive legislative influence are coupled in many subtle way (see