The Swedish Model as a way to the full development of nations.

A game, some history and some empirical evidence

by

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Abstract. The Swedish model of industrial relations is often seen as a good one, both in terms of low relative poverty and development enhancement more generally. In this study, some of the dynamics behind these positive outcomes are unveiled. A theory is proposed and formalized in the form of a three-player mathematical game between national representatives of the government, the workers and the employers. Such a model is then tested, both (i) in the court of Swedish history and (ii) in a broader empirical setting. Findings point towards the idea that the model is (i) historically well founded in the Swedish case and (ii) able to predict similar outcomes in country-cases that more resemble the Swedish one, respectively. Its key message is that it may be smarter for civil society to foster cooperation within its categories, i.e., workers and employers, and directly avoid, as historically in Sweden, high gross income inequality between them to begin with, rather than fighting it back later through heavier income redistribution by the government. In this way, namely if civil society is cooperative, while containing rent-seeking behaviors at the government level, it is also possible to build state capacity and provide the society itself with more public goods, or with extra redistribution, for an initially given amount of fiscal withdrawal, thereby further increasing social welfare. The broadness of the coalition within such a cooperating civil society, indeed, helps avoid imbalance between players in the game, ultimately fostering national development.

Key words   Swedish Model   inequality   redistribution   public sector   welfare   development

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I. Introduction

Observers, for example Milanovic (2012), claim that today it matters more, in terms of comparative welfare, where one lives, i.e., in which country, than where one stays in society, i.e., which social class he/she belongs to. Still, *within*-country inequality represents a serious concern for an impartial spectator —almost as much as the one *between* countries in the world. However, there are nations, like the Swedish, that perform better on this regard, at least in terms of *income* equality.[1] It would be interesting to learn their "secret" recipe and good to replicate it, if possible, elsewhere in the world, especially where most needed because of striking income inequality and poverty levels. It is a goal in this piece of research to, at least partly, unveil the secret of Sweden, by learning from its history, and of countries alike, from broader data analysis.

There are different ways to look at the origins of relatively low income inequality in Sweden; one is income redistribution through taxes and transfers. See for example Kleven (2014). Our perspective, though, has to do with the compact *gross* income structure there, a structure where already relatively few people earn a relatively low wage to begin with. In other words, a structure with relatively low relative poverty rates. Hence, we are mainly interested in the good performance of the lower part of the income distribution; complementarily to the inquiry of other authors, like Björklund et al. (2012), with a focus on the very top of it. Arguably, the origins of such an outcome are to be found in what has become known as the Swedish Model, a model of industrial relations characterized by strong labor unions and cooperation between labor and capital, that would induce other desirable features in the economy like high social welfare notwithstanding a relatively light public sector, and ultimately development. In this picture, already fair pre-tax and pre-transfer income allocation within civil society would complement redistribution performed by the government. More than that, allocation of the first kind would make redistribution less needed, with positive consequences on the nation, through reasonably limited government size and government power and thus, in a sense, *less-extractive* institutions. A theory by Acemoglu and Robinson (2019).

This theory of less-extractive institutions sounds interesting, but we find that, on the one hand, it does not really formalize the dynamics at work between the government and the coalition of categories within civil society —laborers and capitalists/farmers— in a game-theoretic framework, as it could. On the other hand, the predictions of the implicit model its authors have in mind are compared with history and evidence only in a limited manner. No evidence for the specific mechanism is gathered except for the one that comes as an output of some historical analysis, by the way kept at a rather divulgative level, and for the case of Sweden only.

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[1] The distribution of wealth remains rather unequal today in Sweden. See Roine and Waldenström (2009).

Hereafter, we are going to: illustrate the main tenets of the theory and contextualize it in the literature (Section II); improve the formalization of the implicit model its authors have in mind (Section III); deepen their historical analysis to evaluate the applicability of the model to the Swedish case (Section IV); complement the empirical analysis with an additional body of evidence, comprising other countries too, to test the theory more fully (Section V). Some conclusions follow.

II. Theory

Sweden is often seen as a case of low relative poverty, high public provision, balance between government intervention and civil liberty, good economic performance. In this piece of research, in line with theorists like Acemoglu and Robinson (2019), we try to put these aspects together and explore the thesis that, at the basis of that balance, there is low inequality in gross income levels, which, creating a lesser need for the government to redistribute income, would have prevented the public sector from becoming problematically large and powerful in history, thereby enhancing development. Even though "much of this was not designed or planned in advance" (Acemoglu and Robinson, 2019, p. 457), it was at times in history even *deliberately*, in order to avoid this problem and achieve that balance, that Swedish civil society would have organized virtuously in what is today known as the Swedish Model of industrial relations, a model conducive for low gross income inequality at the bottom, in the sense of a relatively compressed income structure where relatively a few people earn much lower (pre-tax and pre-transfer) wages to begin with. From this viewpoint, a coalition of workers and employers would have managed, by directly keeping inequality in income allocation low, to historically circumscribe the role of the government and keep it better under control, thereby originating the mentioned development-enhancing balance.

This theory of (sometimes deliberate) human agency behind equality and development lends to: an improved mathematical formalization of the model at the basis; a deeper historical analysis, with the purpose of evaluating its applicability to the Swedish case; and some empirical testing to understand whether countries whose behavior is nearer, according to a proper metric, to the one of Sweden tend to perform similarly well in economic terms. Which overall will constitute our agenda. We will then see how findings are in the direction of corroborating the theory, in that they are reassuring about the model being historically well founded; and tend to be similarly good for countries more similar to Sweden. However, the scope of this section is purely theoretical: it is just to illustrate in details the theory sketched above and collocate it into a broader debate about inequality.

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Acemoglu and Robinson's theory, applicable to the Swedish case but with a more general reach in principle, is based on two concepts, that they classify resorting to two images, and that deserve some analysis: the one of a *Narrow Corridor*, present since the very title of their work, and the one of a *Red Queen Effect*, very recurrent throughout the work itself.

The first concept is tightly linked with what we have just introduced about the theory, namely, the idea of a balance in how a nation distributes power among the state/government, on the one hand, and (civil) society, on the other. In their words, the argument is that "for liberty to emerge and

flourish[2] both state and society must be strong" (Acemoglu and Robinson, 2019, p. 10). Neither too weak a state —one unable to well control violence, enforce laws and provide public goods— nor too weak a society —one unable to shackle state power— can be there together with the full development of a nation. Their opposites are necessary conditions for development. Between the two extrema of anarchy and a despotic rule, there would be a corridor where state and society "balance each other out". The authors resort to the image of a corridor, and "not a door", because development is a long process evolving in time. Moreover, such a corridor is pictured as narrow; the point was to characterize it as easy to go out of. It is, indeed, neither easy to counterbalance all the power of a heavy machine as the state, nor to avoid that society ends up prevailing with the huge load of particularisms and divisions it usually carries.

Relatedly, the second concept has to do with the idea of a struggle between the two entities, state and society; a struggle that can bring benefits to a nation under some conditions. Since in Carrol's story there is a character called the Red Queen who always has to struggle to maintain its position in the kingdom, the authors of *The Narrow Corridor* labelled such a struggle between states and societies to keep powerful as the "Red Queen Effect". See Box 1 below for more about the origins of this term and its implication. What is important to mention here is that, while all the running in the story brings the characters nowhere else, the race for power between states and societies can have good and far-reaching consequences for a nation. In the taxonomy of game theorists, it is not bound to always be *Zero-Sum*; it can eventually be *Positive-Sum*. This would occur when the two sides grow in influence not one at the expense of the other, but together. When both the state and society grow, while the balance between the two keeps there,[3] the nation as a whole would increase its overall payoff in terms of development. On the contrary, if one side grows cumbersome and overshadows the other, the premises for development would not be good. In this other case, what would be gained by one party would be lost by the other and the nation as a whole would be more likely stagnating.

---BOX 1. The Red Queen Effects. Origins and implications of the term----------------------------
The Red Queen Effect is something known to biologists, even before economists. It describes the effect of a process according to which individuals have to invest effort to defend their position in the environment. Thus, in a sense, it is the effect of just keeping things constant despite continuous investment. This effect is named after the famous character in Lewis Carrol's story *Through the Looking-Glass, and What Alice Found There*. In a passage of the story, Alice meets the Red Queen and cannot understand why, despite continuous running, the landscape does not change. When asked,

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[2] The meaning of such flourishing liberty here is very close to Sen's idea of development as freedom. See Sen (1999).
[3] This is the feature to be kept constant in the "run".

the Red Queen answers that in her kingdom it takes all the possible running capacity to keep in the same place. Acemoglu and Robinson (2019, p. 49) relate with this passage and, actually without any explicit parallel with biology, use it to conceptualize in a fancy way an important tenet of the theory they propose. That in their fight for survival, state and society always try to expand, keep their position unchanged or at least lose the minimum. If in this fight, one of the two gains a lot while the other loses that same amount of fitness, it resembles more a zero-sum game, with no growth overall for the nation. Conversely, if in this fight both sides manage to gain, and the balance of power is kept more even between the two, the game is more positive-sum and the nation overall will experience growth.

Ideally, a nation should stay in the corridor to thrive, and this is likely to happen when a state and a society grow balancedly together, not one at the expense of the other, and so the game is more positive-sum. Fair gross income allocation would be one of the ways through which the redistributive role of the government is contained and thus the balance with civil society better maintained.

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It is worth it to compare the structure of such a theory with another well-known theory about inequality in the economic field, the one by Piketty (2014). Differently from Acemoglu and Robinson, this author suggests that the inner forces of capitalism, due to a growth of the return to capital that is faster than that of national income, tend to produce increasing inequality, unless major exceptional events occur that revert the trend. One of these events, which comprise wars and many other phenomena in history, is the growth of the public sector, with more progressive taxation and redistribution. Thus, interestingly in one theory —Piketty's— we have that the target of lower inequality is reached through a larger public sector that performs the redistributive task, and in the other —Acemoglu and Robinson's— that the same target, plus development, are reached through a smaller public sector that leave income allocation more in the hands of civil society, to its autonomy. Our suggestion in this piece of research is that these two theories may be valid at the same time in a broader theoretical framework where, in order to prevent heavier income redistribution by the public sector, civil society organizes and allocates income already fairly to begin with. This "unified theory" not only provides a simple explanation that could help solve the apparent paradox of relatively light public sectors coexisting with superior national outcomes in terms of inequality and a far-reaching welfare state, but could ultimately shed light also on the study of cases, as the Swedish one, where such a puzzling pattern seems to foster development.

III. A game

The first part of our task has been to try and formalize the theory in a simple but still talkative way. Our suggestion is to build up our model on a kind of interaction as in the Prisoners' Dilemma game, between three players, which we shall call the Governor, the Laborer and the Liberal (who can be either a Farmer or another Capitalist).[4] So civil society has been split into two categories of players. Before defining the overall game, we start for clarity by introducing how a basic interaction between players is modelled in this framework. Each player, in an interaction with others, can opt either for a cooperative behavior or a non-cooperative one (sometimes also labelled as "defective" in the literature). When he/she cooperates, he pays a cost (c) and he/she generates a benefit (b) for the players whom he/she cooperates with. In a sense, the former player becomes a *donor*, and the latter players *recipients* as in Nowak (2006). When he/she chooses not to cooperate, a player receives a benefit or no benefit, according to the other players' choice, and he/she pays no cost. In this framework, a Prisoners' Dilemma arises in each interaction, which can be represented as a game like this (see Table 1 below). An assumption made is that the benefit given out is larger than the cost paid by a cooperator ($b > c$), so that a dilemma effectively arises, in the sense that the individually rational solution of the game delivers a lower payoff than the social optimum for each player ($0 < b - c$). An implicit assumption is also that the players have the same b and c, mirroring a similar cooperative potential in their hands.[5]

TABLE 1. Model of a basic interaction between one player and the others

		Player 2/3/…/n	
		C	NC
	C	*b-c, b-c*	*-c, b*
Player 1	NC	*b, -c*	*0, 0*

*

The overall game builds upon this one. Let us better characterize the choices upon the players for simplicity, and to have an intuitive grasp of ways in which each player can be or not be cooperative with the others. Let the choice upon the Laborer be for example as between protesting (P), when he/she is non-cooperative, or not protesting (NP) for a better treatment, when he/she is cooperative

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with other players. Let the choice upon the Liberal be as between paying a high wage (H), thus being cooperative, or a low one (L), thus being non-cooperative. Finally, let the choice upon the Governor be as between being inclusive (I), when he/she cooperates, or extractive (E), when he does not cooperate with the other players in society.[6] Note that the Governor also benefits from other players being cooperative. If the Laborer does not protest, indeed, when not specified otherwise, we assume it means there is not discontent among workers and thus more support for the government by them. If the Liberal pays high, when not specified otherwise, we assume it means the government is relatively resized in its redistributive role and thus more able to win liberal support. Cooperation works also the other way. Note that both players in civil society, in facts, benefit from the Governor being cooperative, as if the government provided more of a public good when inclusive.

Hereafter (see Table 2 below) is a graphical representation of the game, with payoffs in the column vector for every state of the world, given in the following order from the top to the bottom: Governor (Gov), Laborer (Lab), Liberal (Lib). Note that the game is not sequential; the representation was just chosen as a simple one for a game involving three players.

<p style="text-align:center">TABLE 2. The principal game</p>

Governor								
I					**E**			
		Liberal					Liberal	
		H	L				H	L
	NP	*Gov:* 2b-c	b-c			NP	*Gov:* 2b	*b (b)*
		Lab: 2b-c	b-c				*Lab:* b-c	*-c (b-c)*
		Lib: 2b-c	2b				*Lib:* b-c	*b (0)*
	P	*Gov:* b-c	-c			P	*Gov:* b	*0 (b)*
		Lab: 2b	b				*Lab:* b	*0 (b)*
Laborer		*Lib:* b-c	b	Laborer			*Lib:* -c	*0 (-b)*

In addition to what already explained, in the cells corresponding to the strategy profile (E, NP, L) and (E, P, L), the payoffs in parentheses represent extra possibilities that will be distinguished with the superscript "*bis*".

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[6] The cooperative strategy is always the first one from top down or from left to right; the non-cooperative one comes always second.

One is the possibility that the Governor makes an alliance with the Laborer, thus giving him/her a benefit, at a total cost b paid by the Liberal.[7] This scenario, which will be named (E, NP, L)^{bis}, payoffs in red, is descriptive of what can happen in countries, like Sweden, with historically relatively strong labor movements. In other countries, like Germany, labor movements were historically less able to get to rule, because of a lesser compromise with other, more liberal, political forces. The scenarios that better describe these countries are: (E, P, L)^{bis}, which is most likely politically unfeasible because of the loss of liberals' neutrality though, and, thus, eventually, (E, P, L), with non-cooperation prevailing. In the historical section later on (Section IV), we will better see how these different assumptions for different countries are consistent with findings by economic historians.

Although rather simplificatory, this game formalizes a bunch of other interesting dynamics. First of all, there can be seen how the state of the world where players play (E, P, L), to the right at the bottom of the tabular representation, despite being a Nash Equilibrium,[8] is sub-optimal for each of them if compared to the social optimum (I, NP, H), to the left at the top of the tabular representation. In the second place, we can see that both the Governor and the Laborer are worse off in that equilibrium with respect to how they are in (E, NP, L)^{bis}, which is still worse than the social optimum for every player.

These outcomes of the game correspond with three possible states of the world. The non-cooperative equilibrium (E, P, L) may represent the situation of many countries where there is relatively little cooperation between parties in civil society, as in the mentioned Germany back in the 19th century, and the government is not well in check. The strategy profile (E, NP, L)^{bis}, where the Laborer and the Governor are allied without strong cooperation with the Liberal, could be seen as a representation of the counterfactual, in countries like Sweden where it is not as unrealistic as elsewhere historically, in which the labor movement hypothetically had to rule but in the absence of a strong coalition with the liberals. The social optimum (I, NP, H) arguably recalls the actual situation of countries like Sweden, where there is cooperation between labor and liberal forces, and good checks on the government.

It is interesting to note, when comparing the non-cooperative equilibrium with the other two outcomes (the counterfactual scenario and the social optimum), that being the counterfactual scenario strictly preferred by both the Laborer and the Governor, and the social optimum by all players, over non-cooperation, there is room for self-reinforcing institutional arrangements that discourage defection, which is what pushes players away from the more cooperative achievements.

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[7] An assumption we make is that redistribution of a sum of money comes with a cost: the money is not transferred for free. We assume, in particular, that, being us near the point of optimal fiscal withdrawal, the total cost of redistribution equals its total benefit.

[8] A fixed point in the game from which no player has incentive to unilaterally move from. See Nash (1950).

One of such arrangements is a Gov-Lab coalition. It is, however, institutionally unstable "towards the top". When comparing the social optimum with this counterfactual scenario, indeed, it can be seen that in the former the Laborer gets the same plus he/she additionally receives the benefit from an inclusive Governor, which in the latter does not. In symbols, there is a Laborer's net gain from the hypothetical change of settings, that is

$$(2b - c) - (b - c) = b \quad .$$

The Liberal as well has something to gain, in that he avoids harmful redistribution and benefits from the public good let out by the inclusive Governor. The Liberal, then, will prefer that setting because of two sub-gains: the lower cost of direct income allocation versus indirect redistribution (for a given net benefit of the Laborer) and the lesser extraction by the Governor. In symbols, there is a Liberal's net gain from the hypothetical change of settings, that is

$$(2b - c) - 0 = 2b - c = (b - c) + b \quad .$$

Hence, there are incentives for both the Laborer and the Liberals to institutionally commit to cooperate as in the social optimum. We have noted that, in the change, the provision of public goods for civil society has increased. Note, however, that civil society would get overall richer by cooperating, even if the Governor defected:

$$2(b - c) > b - c \quad .$$

Even if the Governor defected, the same goals as before, the initial wage for the Laborer and the initial public good provision, as in (E, NP, L)^{bis}, would be maintained under the change of settings, but with a decrease in fiscal withdrawal in the new setting (E, NP, H). Also in the socially optimal setting (I, NP, H), fiscal withdrawal is the same as in countries other than Sweden, represented by the non-cooperative equilibrium (E, P, L), but the reach of public provision could be larger in that, with the same budget, the Governor can now provide extra redistribution or he/she can focus more on public good provision. If he/she is benevolent (which is not an assumption in our model) or shackled by civil society or simply willing to reinforce broader cooperation by civil society, he/she will increase the reach of public provision.[9] The Governor, indeed, would actually lose something in the change of settings from the counterfactual (E, NP, L)^{bis} to the social optimum (I, NP, H) because

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[9] In the case of Sweden, fiscal withdrawal has been maintained rather high and so has public provision —once the need for basic redistribution has been reduced. In the model, indeed, the government in Sweden has to take care of public good provision only, and/or possibly extra redistribution, with the same fiscal withdrawal (and budget) as in other countries, whose government has to take care also of basic redistribution. In presence of a reduction in the redistributive task of the government, though, there is theoretically more room for both things: either higher-level public provision can be achieved for a constant level of fiscal withdrawal or less fiscal withdrawal can be achieved for a constant level of public provision. In any case, it is true that, in a country where the need for basic redistribution is kept relatively low, for whatever given amount of social welfare, a lower fiscal withdrawal will be needed than in the case of a relatively high basic redistribution to be added as a government task. Public provision, thus, becomes an easier matter.

he/she will be more in check and will have to pay the cost of cooperation, but he/she would also gain the before missing support of the Liberal:

$$(2b - c) - b = b - c \ .$$

Importantly, note that the change itself would bring a more balanced state of things to the nation, characterized by relative abundance and equality within civil society, represented in the model by an even level of fitness for its players (see Figure 1 below), and an evenly high level of fitness for the government as well:
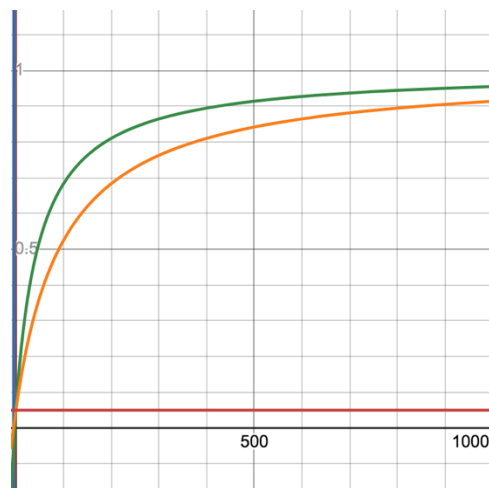
$$2(2b - c) > b - c \ ,$$
$$\pi(Lab) = \pi(Lib) = 2b - c = \pi(Gov) \ .$$

Also, when all players cooperate, sticking to the strategy profile (I, NP, H), the highest total payoff for the society of players, representing the whole nation, is reached:

$$\pi(N) = \pi(Lab) + \pi(Lib) + \pi(Gov) = 3(2b - c) \ .$$

It comes in the state of the world in which the Liberal pays well, the Laborer does not protest and the Governor does not get extractive.

Figure 1 – The convergence to equality within civil society in time.

Equality is measured in the graph by the ratio of the welfare of the Laborer over the welfare of the Liberal, taking also wealth into account; time is measured as the number of game periods played. Initially, at time zero, welfare is unequally distributed. If every period there is no additional net benefit for the players, there is no convergence to equality: the status quo is just maintained, as represented by the flat red line. If every period there is gain of an identical net benefit for the players, there is convergence to equality (with a unit value of the wealth ratio as a limit), as represented by the two hyperboles. Moreover, the greater the identical net benefit, the faster the convergence; as represented by the fact that the green curve approaches more the unit-value limit with the passing of time than the orange curve does.

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It is thus the Lib-Lab coalition that, by also keeping the Governor more in check, guarantees the social optimum. By circumscribing the need of heavy government involvement, indeed, while cooperating

within their coalition, laborers and liberals make less likely for it to be able to defect and, while expanding too much, move away from what is socially optimal.

However, the importance of the strength of labor movements is a message that the model conveys as well. Indeed, in countries, like Sweden, where the labor movement is in a stronger position to rule, its contractual power is greater and the liberals have to be more cooperative with it, if they want to avoid a less desirable setting for them, in which cooperation is more between the labor movement itself and the government instead.

To see this in the model, consider that while negotiating with employers, in countries like Germany, where workers have as an outside option a state of things (E, P, L) with payoff 0 for them, they are probably less able to make their voice heard than in countries, like Sweden, where their outside option (E, NP, L)$^{\text{bis}}$ delivers them a higher payoff of $b - c$.

Relatedly, another interesting form of instability, in part already discussed, is again the instability of the mentioned Gov-Lab coalition but "towards the bottom". Since $b > b - c$ for the Laborer, there is a risk from (E, NP, L)$^{\text{bis}}$ to end up in (E, P, L)$^{\text{bis}}$. In countries where the labor movement is historically relatively weak as an electoral force because of the lesser compromise with other more liberal political forces, though, the latter scenario represents rather what the labor movement itself would like to obtain, but realistically cannot because of liberals' opposition. The result is (E, P, L) more probably instead: low levels of national cooperation overall. It is the case of Germany. However, where the labor movement is historically relatively strong and more neutral by a liberal perspective, we may expect less instability of this kind, and (E, NP, L)$^{\text{bis}}$ can be considered relatively stable. It is the case of Sweden. We have seen the one for Sweden, but what about the more likely final outcome in countries, like Germany, with historically weaker labor movements?

TABLE 3. The principal game with a stronger Liberal (e.g., in Germany)

Governor										
I					E					
		Liberal						Liberal		
		H		L				H		L
Laborer	NP	Gov: 2b-c Lab: 2b-c Lib: 2b-c		b-c (-c) b-c (2b-c) 2b (2b)		Laborer	NP	Gov: 2b Lab: b-c Lib: b-c		b (0) -c (b-c) b (b)
	P	Gov: b-c Lab: 2b Lib: b-c		-c b b			P	Gov: b Lab: b Lib: -c		0 (b) 0 (b) 0 (-b)

Labor being a less veritable electoral force, the political arena is most likely dominated by more liberal voices there as in (I, NP, L). More inequality within civil society ($\pi(Lab) = b - c < \pi(Lib) = 2b$) and thus a weaker coalition between its parties are expected, with less compliant workers. It is not a very stable outcome. Even less, if one considers that the government is likely to be less in check, especially in case extra redistribution takes place heavily via the public machine as in (E, NP, L)[bis], at a total cost b for the government itself. Or, in terms of political balance, because of a weaker workers' side, with consequent increased risk of elite capture. (I, NP, L)[bis] somehow describes a government still in check, despite heavy extra redistribution. Less fitness than in the social optimum is enjoyed by the government anyway, also when free-riding, because even if it had to do with non-protesting labor, it would be without the liberals helping in assuring such an outcome ($-c < 0 < b - c < b < 2b - c$). Most likely, in these countries attempts to set a socially optimal institutional arrangement up are bound to fall down again into universal non-cooperation, i.e., non-cooperation between all players, via the mentioned asymmetric and unstable outcomes (I, NP, L) or (I, NP, L)[bis] and, more likely, (E, NP, L)[bis], payoffs in purple (see Table 3 above).

<div align="center">*</div>

Back to the Swedish case or alike cases, instability represents an interesting dynamic in terms of our game's predictive power there as well. In particular, a form of instability is, importantly, the instability of the socially optimal institutional arrangement. The same game, revisited (see Table 4 below) with the addition of two other possible outcomes in parentheses, (I, NP, H)[bis], payoffs in blue, and (E, NP, H)[bis], payoffs in gray, shows some instability of that form.

<div align="center">TABLE 4. The revisited game "1970s" version</div>

		Governor						
		I					E	
		Liberal					Liberal	
		H	L				H	L
	NP	Gov: 2b-c (b-c)	b-c			NP	Gov: 2b (b)	b (b)
		Lab: 2b-c (3b-c)	b-c				Lab: b-c (2b-c)	-c (b-c)
		Lib: 2b-c (b-c)	2b				Lib: b-c (-c)	b (0)
	P	Gov: b-c	-c			P	Gov: b	0
		Lab: 2b	b				Lab: b	0
Laborer		Lib: b-c	b	Laborer			Lib: -c	0

Even when the status quo is the social optimum, in which he/she is already paid well, the Laborer, indeed, could still try to call for further redistribution via the Governor, but probably with a less

enthusiastic Liberal as a side effect. In the historical section later on (Section IV), we will see how this type of instability of the social optimum was present in the 1970s in Sweden; thereby the name of the version of the model that take into account such a possibility (above).

Also, both the principal and the revisited game shows that the "temptation" for the Governor to grow larger in influence is always there. The coalition within civil society can reduce its reach, but the risk remains —the highest payoff of the Governor still is obtained through defection, in (E, NP, H) ($2b >$ $2b - c$) and in (E, NP, H)$^{\text{bis}}$ ($b > b - c$). What is more, the road from (I, NP, H)$^{\text{bis}}$, where the Laborer asks for more redistribution via the Governor even though already well-paid, to (E, NP, H)$^{\text{bis}}$, where the Governor has got extractive, is probably more straightforward than that from (I, NP, H) to (E, NP, H). This because, being the Liberal less enthusiastic (and thus the Lib-Lab coalition likely weaker and less able to shackle the Governor) and the Governor more active redistribution-wise in the former status quo (than in the latter), there is more room for the Governor's defection when starting from it, ceteris paribus.

In a sense, it is the same non-cooperative dynamic at the basis of cartels between oil companies: they could all agree to institutionally cooperate by reducing the production of oil, so as to let its price increase, and benefit from that as oligopolists; but this agreement was actually not stable, there being incentives for the parties to unilaterally break it and defect (in the particular case, by producing and selling more oil than agreed, while other player-companies were limiting their own production in a cooperative fashion).

Back to our case, the problem with similar free-riding dynamics is that they depress cooperation, with less benefits let out by players within society and thus less welfare in the end. Recall that when all players defect in the game, the lowest total payoff for the society of players as a whole is reached: $\dot{0}$. It is what Acemoglu and Robinson (2019, p. 464) labelled a *Zero-Sum* Red Queen Effect, versus the *Positive- Sum* one. See again Box 1 (above) for a more detailed discussion. The second kind of effect is generated when strategic coalitions of players are formed and cooperation arises among them, in the end for the benefit of the society of players, or the nation, as a whole. In the absence of specific mechanisms or institutional arrangements though, the non-cooperative equilibrium remains an attractor for players.

<p align="center">*</p>

One of such institutional arrangements is the Lib-Lab coalition. We have already argued that a Lib-Lab coalition can make the Governor's defection less likely. In case the Governor still does defect though, we have to highlight another specific mechanism at work, when the game is played in a democracy. Namely, that out of a consensus within the same coalition he/she can always

democratically be sent home with a zero payoff. This is another mechanism fostering cooperation, intrinsic to the fact that the game is played in a democratic institutional framework.

The same game as before, revisited (see Table 5 below) with the addition of another possible outcome in parentheses, (E, NP, H)[bis], payoffs in green, shows that if the Governor defects, the risk is there for him/her to lose the support of a wounded civil society. Both the Laborer and the Liberal, indeed, have a strong preference for the inclusive attitude by the Governor of before ($2b - c > b - c$), and can threaten to use their constitutional power in a democracy in order to force such an inclusive attitude on his/her part. In the historical section later on (Section IV), we will see how this type of instability of the social optimum was present in the 1990s in Sweden, thereby the name of the version of the model that take into account such a possibility (below).

By the way, this version of the game can be also read in another talkative manner, consistently with other considerations before. Starting from the Gov-Lab coalition in (E, NP, L)[bis], indeed, there is an incentive for the Liberal to push for sending the Governor home, under the neutrality of the Laborer, as shown in the passage to (E, NP, H)[bis]. From that status quo, the Governor in turn will try to gain the Liberal's support, and if, additionally, the Laborer pushes as well while looking forward to a new inclusive Governor, the Governor himself/herself will have no choice but to either become inclusive himself/herself or become the *old* Governor, thereby anyways leaving the floor to the social optimum institutional arrangement.

TABLE 5. The revisited game "1990s" version

		Governor					Governor		
		I					**E**		
			Liberal					Liberal	
			H	L				H	L
	NP	Gov:	2b-c	b-c		NP	Gov:	2b (0)	b (b)
		Lab:	2b-c	b-c			Lab:	b-c (b-c)	-c (b-c)
		Lib:	2b-c	2b			Lib:	b-c (b-c)	b (0)
	P	Gov:	b-c	-c		P	Gov:	b	0
		Lab:	2b	b			Lab:	b	0
Laborer		Lib:	b-c	b	Laborer		Lib:	-c	0

*

As pointed out also in Box 1 (above), although involving some cooperation, all these effects are generated still in a context of conflict between players, where every player keeps "fighting" rationally for *his/her own* best interest (somehow resembling the Red Queen in Carrol's story, who always had

to run in order to keep *her own* position unchanged in the kingdom). Box 2 (below) contains a representation of the same games in the form of a dialogue.

---BOX 2. The same game(s) in the form of a dialogue---

In this box, we incidentally propose, following the approach by Green (1993), a representation of the same versions of the game in a dialogic form, for the purposes of greater clarity.

As Green's three players in his different context, our three players —the Governor, the Laborer, and the Liberal— can be thought as interacting verbally with each other in a similar fashion to the following.

Note that there is correspondence between the four dialogues I-IV (below) and the four Tables 2-5 (above).

I. The principal game

LABORER: «Oh, Governor, you who rule upon society, please go and take some money away from the Liberal, who has much, and give some to me, who have little. In exchange for that, I will not protest anymore and will be supportive of your rule upon us».

GOVERNOR: «Well, Laborer, your request has been listened to and I will do as you ask. I will go to the Liberal, and he will have to give me some money as a tax, which I will partly transfer to you, net of the cost of this same operation to redistribute income».

(The Liberal hears that.)

LIBERAL: «Listen Laborer, I do not like this agreement you made with the Governor. Consider my alternative proposal instead: I can give you directly as much as the Governor offered to give you, but do not you call for the Governor to intervene in our affairs anymore. In this way, we will have him more in check and it will be way better for both of us!».

II. The principal game with a stronger Liberal (e.g., Germany)

LIBERAL: «Since you Laborer are so busy with ideological quarrels out of the Parliament and I have the most powerful voice here, I will find a way to pay you less».

GOVERNOR: «Liberal, you really are the most powerful citizens' representative in this Parliament. Do as you wish. (Since the Laborer is almost out of the Parliament and the Liberal does whatever he likes, I will not care anymore for the good of my citizens)».

LABORER: «It is impossible to live in this country, with a Liberal that pays badly and moreover with a Governor that provides a few public goods. I will seriously consider protesting».

(As social discontent grows.)

LIBERAL: «Governor, in order for the Laborer's protests to cease, I suggest that you give out some more public goods. It will weigh on the public finances, but in exchange you will have social rest».

GOVERNOR: «Liberal, I know you are the most powerful citizens' representative in this Parliament, and I take into account what you suggest. I myself would prefer avoiding more redistribution as it would hit heavily on the public finances, I will think about public good provision. Either way, it is not easy without any cooperation of you!».

III. The revisited game "1970s" version

LABORER: «Oh, Governor, you who rule upon society, please go and take some money away from the Liberal because, although he already pays me well, he still has a lot more than me. In exchange for that, I will not protest anymore and will be supportive of your rule upon us.

GOVERNOR: «Well, Laborer, your request has been listened to and I will try to do as you ask. I will go to the Liberal, and try to use my authority to collect some money as a tax, which I will partly transfer to you, net of the cost of this same operation to redistribute income».

(The Liberal hears that.)

LIBERAL: «Listen, Laborer, I do not like this new agreement you tried to make with the Governor. I have actually been paying you well lately and I really cannot offer you more. Try whatever with the Governor, whom I do not trust anymore. The two of you will not have my support!».

IV. The revisited game "1990s" version

GOVERNOR: «Oh, Civil Society, I have to use my authority heavily here but for the greater good of all of us, the nation;[10] you Laborer just have not to protest for a better treatment and you Liberal just have to pay as usual».

LABORER and LIBERAL: «We actually do not believe your recipe to be beneficial for us. Let us see what you are capable of doing without our support!».

III. 1 A game. A wrap-up

To briefly sum up the section, the baseline game is built so as to have universal non-cooperation, i.e., non-cooperation between all players, as a Nash equilibrium. Nevertheless, there are incentives for the players to find institutional ways to cooperate and reach states of the world that are superior for them.

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[10] Especially in democracies, when governments take decisions that decrease social welfare, they usually justify that by summoning some kind of greater good, in order for them not to lose civil support. Interestingly, the Civil Liberty Index we will exploit in Section V also captures this aspect of reality.

One is the Gov-Lab coalition, which can be considered pretty stable "downwards", in the sense that parties involved will not look for more extreme formulas of the coalition itself, at least in countries like Sweden, because of the likely result in that case of falling again into the non-cooperative equilibrium, at the "bottom" of the game (down to the right side of the tabular representation).

However, this coalition is not really stable "upwards", at least institutionally, in the sense that laborers and liberals are both incentivized to seek cooperation with each other, while circumscribing the redistributive role of the government, and reach the social optimum, at the "top" of the game (up to the left side of the tabular representation).

Although not a Nash equilibrium strictly speaking, once this outcome is reached, institutional arrangements are likely to bloom that stabilize it. Indeed, if either the Laborer or the Liberal stop cooperating, the Governor is more likely to get extractive; and the result is again either the non-cooperative equilibrium, which is worse for each player, or the counterfactual Gov-Lab coalition, which is inferior in value for both the Laborer and the Liberal. It is, hence, better for them to find institutional ways to protect cooperation under the social optimum.

If, from the reached social optimum, the Governor anyways managed to free-ride on civil society as a whole, it could still be sent home with zero payoff out of social consensus in democracies. It is, hence, not only more difficult in the presence of a Lib-Lab coalition for him/her to defect, but also better for himself/herself to keep cooperative ("1990s" scenario).

If from the social optimum the Laborer and the Governor tried a further alliance, the Liberal would exit the three-fold coalition and they would again end up into the former Gov-Lab alliance; then, the Liberal could still propose the social optimum as a better arrangement for them to the Laborer, or vice versa ("1970s" scenario).

One more time, although a less pervasive Governor is beneficial for the society of players in this game, there is a point for a nation in having an initially weaker Liberal, and an initially stronger Laborer able to enter a coalition with the Governor. It is that, to push the Governor out of his/her business, the Liberal, in the setting he/she may propose, would have to assure the Laborer at least as high a wage as the latter would receive under such a Gov-Lab coalition. If that counterfactual wage is relatively high in a country, the Liberal has to commit more seriously to keep up with it. So, an initially stronger Laborer is the one that may kick-start the whole process in a sense.

<div align="center">*</div>

Having thus defined the game, we are naturally left with an agenda. First of all, has the game got something to tell us about history? We should be able to assess whether these dynamics, which the game highlights, can actually be qualitatively found in the history of Sweden. More in particular, we are left with three main questions. The first one is: were there relatively strong labor movements

historically in Sweden, which justify the assumption of a better outside option for workers there? The second one is: was there an exceptional degree of cooperation between labor and capital in the country at some point in time that prevented government's influence from growing too large on civil society, as in the social optimum of the game? The third one is: was there at times some instability in this pattern, which can be seen as due to defection pushing towards individually more rational choices that combined together in the interaction, though, are eventually socially undesirable, as in a typical Prisoners' Dilemma? In the second place, we will test more quantitatively our main claims. The next section (Section IV) is more historical. The section after (Section V) will be more empirical.

IV. Some history

The second part of our task, having formalized Acemoglu and Robinson's theory into a game in the mathematical sense, has been to verify its applicability to the history of Sweden. Were really the theoretical mechanisms highlighted by the game present in the historical developments of the country? Were there relatively strong labor movements in Sweden? Was there actually a coalition of laborers and farmers/capitalists that prevented government's influence to grow too large on civil society? In this chapter, we will show that yes, the model helps explain the reality we observe, i.e., the Swedish relatively compressed income structure, relatively high levels of public provision and development, and this by taking into account true key historical events: it is historically founded. In this way, when checking the applicability of a game-theoretical explanatory framework to a case in economic history, our exercise here will resemble the one of, e.g., Greif (1993). In the exercise, we will consider five major phases of the country's timeline. A coalition between laborers on the one hand and farmers/capitalists on the other is particularly evident in the 1930s, but it was not a dynamic confined to the decade. It is one that has its origins in the former history of the country, and that it does not cease with the decade, going on instead in the Post-War years, until the 1970s. Interestingly, in the 1970s, and then again in the 1990s, the coalition shows some instability. In the following subsections, each of these historical phases is analyzed in more detail. The historical work made by Acemoglu and Robinson (2019, p. 449) will be in some cases complemented and improved with some additional relevant analysis proposed by other scholars.

IV. 1 Origins

The origins of the pattern of relatively low inequality in Sweden in the twentieth century are often seen as dating very far back in time, as if the pattern was the result of a very long-term trajectory. Acemoglu and Robinson (2019, p. 449) seem not to care too much about the very origins of the pattern, but they are no exception when they refer to Sweden as having a "long history of parliamentary tradition" and to a landed aristocracy that by the nineteenth century "had lost much of his wealth and power" there.[11] See also Acemoglu and Robinson (2019, p. 182). However, it is acknowledged that "the extent of the suffrage was limited" until the beginning of the last century (Acemoglu and Robinson, 2019, p. 449).

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[11] Roine and Waldenström (2009) are less hasty in stating that wealth concentration decreased during the agrarian state and early industrialization. However, they do state that it decreased starting from WW1 and across the twentieth century until the 1980s. Also, Roine and Waldenström (2008), note that parallelly "the income share of the Swedish top decile drops sharply over the first eighty years of the twentieth century". Most of the decrease seems to have taken place before the expansion of the welfare state: "by 1950 Swedish top income shares were already lower than in other countries".

According to Bengtsson (2019), this aspect is crucial. In countries like Germany, where the political involvement of the middle class was already larger, the middle class itself tended to ally with the upper classes in a liberal coalition against workers. In Sweden, on the contrary, the middle class looked downward and there came to be a broad proto-socialdemocratic coalition between it and workers, both excluded from suffrage and both willing to make their voice heard more in the political arena. This broad "small-folk" alliance put Sweden on "a democratic and egalitarian rather than an authoritarian route". Some authors, like Perry Anderson commenting about Britain, where Lib-Labism, i.e., liberal influence over workers, was strong too,[12] think that this phenomenon diluted and weakened the effectiveness of the social democratic labor movements. Others, like Hurd and Bengtsson (2019) himself, argue that such a fusion placed them "in a strong position to reform society". They impute to it the fact that the Swedish labor movement was uniquely strong.

We embrace the second point of view. It is, also, something politicians at the time were increasingly aware of, like the one quoted by Acemoglu and Robinson (2019, p. 449), the socialist Branting, who in 1886 is arguing that the working class "needs the help" of the middle class, and vice versa, in order to turn the Swedish workers' party (SAP) into a credible electoral force.

This historical scenario, thus, shows some degree of cooperation between workers, represented by the Laborer in the game, and employers (farmers or other capitalists), represented by the Liberal in the game. A coalition of the two representative players seems to be present in Swedish history since roughly the 1870s. The attested presence of a similar coalition suggests the idea that players in it were more likely to play their cooperative strategy when interacting with each other, i.e., NP (not to protest) the Laborer and H (to pay well) the Liberal. What about the Governor? We have noticed how politicians at the time started feeling the need to be more and more inclusive of both categories within civil society to successfully and democratically gain power enough to rule steadily. However, we will argue in the next subsections that later in history the fact that the Lib-Lab coalition helps keep the government shackled can be seen more clearly.

IV. 2 The 1930s

The Great Depression meant hard times for Western countries overall during the decade. However, the reaction to it considerably differed across them. While countries like Germany, which experienced the birth of Nazism, went out of the corridor in these years, Sweden stands out as a good example of how far ahead nations can go when they stay in it. Indeed, Sweden managed not to abandon the balance between its enlarging state capacity and its empowering civil society, which allowed Positive-Sum Red Queen Effects to be at work.

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[12] Because Britain industrialized before the spread of socialism. Bengtsson (2019).

We have discussed in the previous subsection how the SAP played an important role at the beginning of the century in the achievement of universal male suffrage, getting to involve in the political sphere also categories other than workers, like farmers, that did not have representation before. The involvement of farmers did not end with representation. They had clashing goals in some ways: workers wanted higher wages, while farmers did not want to pay them; workers did not want food prices to go up, while farmers wanted agricultural price support. In the 1930s, despite such clashing goals, the two categories found a compromise. The SAP entered an alliance with the Agrarian Party, that achieved a result characterized by state intervention in two senses: government spending in the industrial sector was pushed up, together with wages, while protectionist measures were introduced that increased agricultural prices domestically. A compromise sometimes labelled by historians as the "Cow Trade".

This policy package did not meet initially the approval of the business community, who was afraid to lose competitiveness because of the higher wages to be paid. However, the situation changed later on in the decade. The broad support received at the elections in 1936 led to a greater involvement of the business community in the coalition. In 1938, a meeting in Saltsjöbaden of the representatives of trade unions, farmers and also business interests with the government, ended up with the homonymous agreement. Not only the Saltsjöbaden Agreement was characterized by the acceptance by employers of higher wages for workers in exchange for more cooperative labor relations (e.g. reduced strike activity), it also marked a procedural twist in negotiations to set wages with regard to the role of the government. As a method "for avoiding costly disputes", like reported by Schön (2012) in his *History of Modern Sweden*, the agreement set the standard of no government involvement in such negotiations.

This historical scenario somehow recalls, and better corresponds in the model with, the strategy profile (I, NP, H), in the upper left corner of the tabular representation of the game, in which the influence of the government is kept under control by the two categories in civil society, workers and employers, cooperating with each other. As noticed, in this scenario, the social optimum is reached, with the nation overall enjoying the highest possible payoff.

IV. 3 The Post-War Years

In the post-war years, after WW2, the Lib-Lab coalition kept going and generated further developments. Consensus grew around the concept that the Swedish state should promote both equality and growth. On this note, it is relevant to highlight that they were the years of the fortune of the Rehn-Meidner model. It was a centralized wage setting model, in which wages were fixed through social bargain for all firms at the industry-level. On the one hand, this created wage compression

between workers, with people doing the same job being paid the same everywhere. On the other hand, it meant, for businesses with a productivity above average, that they had not to pay higher wages, and thus could retain the higher profits they get —which also had the effect of incentivizing investment and innovation.

Regarding the government side, it was a period of outspring. The ascent of the *welfare state* meant not only more generous benefits, but also universal coverage for the population. The important thing to note is that this ascent on the government side, was accompanied by an empowerment on the side of civil society, which guaranteed a balanced trajectory of the Swedish nation towards progress. Acemoglu and Robinson (2019, p. 452) point out several mechanisms through which civil society kept the Leviathan shackled. The first they mention is just the coalition between laborers and liberals. The presence of laborers within the ruling political force was a shield against the possibility of "elite capture", while the presence of liberals within the ruling political force was a shield against "nationalizations and expropriation of capital".

In the next subsection, we will see an example of how at times trade unions pushed for further wage increases but the SAP used to resist the pressure. Another example of pressure towards imbalance that is resisted by the ruling party is given in the last historical subsection. This second example shows pressure towards imbalance of a different flavor, being about pressure not by workers and the government against employers, but against workers, and employers as well, by the government. In either case, the message is that the Lib-Lab coalition, by avoiding drifts to government overinfluence in one sense or the other, kept Sweden in the corridor for development. Overall, also moments of decreased balance in Swedish history help shed light on the dynamics at play and better test the ability of the proposed model to portray reality.

IV. 4 The 1970s

The 1970s registered the first time, after decades of victories, that the SAP lost an election. Acemoglu and Robinson (2019, p. 452) claim that this was a manifestation of the coalition's power to avoid communist drifts and reorient political action when such a risk was concrete. Here briefly how it went. The debate in the decade was about profits, seen by someone as "excess profit", obtained by those firms that had a higher-than-average productivity but still paid the average wage in the industry to their workers, according to the Rehn-Meidner model. In particular, at the time there were political currents near trade unions pushing for the creation of wage-earner funds, collecting these extra-profits and distributing them to workers. The SAP, which usually resisted similar pressures, in this occasion did not. The existence of the ruling coalition was felt by large part of the public opinion as under attack, opposition to the SAP grew and the result was the mentioned electoral defeat (in 1976). Thus,

the liberal wing of Swedish civil society prevented more extreme reform from taking place and government influence to grow too cumbersome at the expense of market incentives.

IV. 5 The 1990s

Acemoglu and Robinson (2019, p. 455) rather generically refer to another episode in the 1990s in which "some of the regulations" were pushed "too far" again and the Swedish political system reoriented itself in response, under the leadership of the Lib-Lab coalition.

There was again some pressure towards the instability of the coalition; but this time the pushing forces were not generated by workers. They were acting *against* workers instead, and against employers too, and they were generated by the government. Erixon (2011) argues that the 1990s represent "the most obvious departure from the Saltsjöbaden Agreement" in Swedish history. Let's consider what happened starting from a little earlier.

In the post-war years trade unions typically pushed for wage moderation out of concern for macroeconomic stability and in line with the Saltsjöbaden Agreement of 1938. The prevalent idea at the time was to combine expansionary economic policy for full employment in the Keynesian way and price stability. Also, under fixed exchange rates, external balance was a goal; and it was thought that employment would benefit from wage restraint through improved Swedish market shares.

In this context, voluntary income policy, in the sense of no government involvement in wage negotiations, did not exclude a high public pressure on trade unions to accept moderate wage increases. What is more, on some occasions of extraordinary overheating, during the 1970s (the so-called "Haga Agreements" after OPEC I) and the 1980s (the so-called "Rosenbad Rounds" after the boom), there was a return back to three-party negotiation. At the peak of overheating in 1990, the social democratic government proposed a drastic income policy arrangement "including price and wage freezes and also a ban on strikes" (Erixon, 2011, p. 277). The proposition, however, was rejected by the Parliament, which led to a government crisis and the resignation of the Minister of Finance (Feldt). The agreement of 1938 had been put under pressure, but eventually the result was another historical "no", by a united Swedish civil society, to larger government involvement.

VI. 6 Some history. A wrap-up

Two important aspects emerge from late modern Swedish history. The first aspect is that labor movements actually were relatively strong, if compared to the ones in other European counterparts of Sweden, like Germany, in that they were in a stronger position to rule and bring reform to the nation, thanks to a greater compromise with liberal demands that made them a more veritable electoral force. The second aspect is that, besides the historical signs of such a cooperation with each other by

national stakeholders within civil society, there exists historical evidence documenting that at the same time, during the last century, they were together engaged in the effort to circumscribe government power to interfere with their interests. This pattern historically helped Sweden keep on track, despite minor episodes of instability, with quite a light public sector, notwithstanding relatively low income inequality and high levels of public provision, with comparative development as an outcome. In the following section, we will further put under scrutiny this proposition, by empirically testing it in a stricter sense.

V. Some empirical evidence

In this section, we propose an econometrical analysis, as a complement to the evidence from Swedish history and to all the evidence that Acemoglu and Robinson (2019) gathered and based their theory on, to further test its validity. The theory of the public sector as a backstop for equality by Piketty (2014) has some relevance too, in how we will interpret our results. Consistently with the rest of the work, this analysis relates with civil liberty and inequality as a topic, and in particular collocates into a strand of the scientific literature attempting to evaluate the effect, functional or disfunctional, of civil liberty and inequality on development outcomes; and the likely mechanisms through which it operates. More in particular, we have tried to isolate the extent to which civil liberty impacts development through variations in gross income inequality. The theoretical claim is the same we have been proposing until this point, that the choice of more civil liberty, in the form of less government involvement, is politically feasible where workers are kept happy by employers with what they receive as a wage. So, the choice of increased civil liberty, in the form of less redistribution, very likely produces distributional consequences, with less gross income inequality as a first outcome, in democracies. Retaining this change in inequality as a proxy of how much the government is resized in its redistributive function, i.e., of how much the need for redistribution by the government is reduced by civil society, we can measure how much civil liberty impacts development through the reduction in redistribution by the government.

This reduction could have effects on development in different ways. The ones we are interested in are public sector channels: the government, now at least in part liberated from its redistributive role, will have more budget available for public provision and will be more shackled by, or better in check from the point of view of, civil society. However, these are not the only ways in which civil liberty, through variations in gross income inequality, can affect development. A variation in inequality, in our sense, and thus in relative poverty, indeed, can also affect how much people are effectively capable to make a good use of their formal civil liberty. In principle, we would like to isolate the effect of civil liberty on development through the public sector channels, that we are interested in, on the one hand, from the effect through poverty, that is a confounder, on the other hand; but we will see that the two variables that mediate the effect are empirically proxied together by a same indicator disposable in our dataset: the Low Pay Ratio. This means that our inference will be subject to omitted variable bias, as long as we are not able to isolate the impact looked for, the one of public sector channels, from the impact of another confounding variable, poverty. We will, therefore, suggest a way to mitigate this bias. Having introduced the aim of this section, we can now enter more deeply into the proposed methodology.

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First of all, a brief recap of the theory we should have in mind thanks to the previous sections and that we are now going to test. A cornerstone of the theory of the *Narrow Corridor* (Acemoglu and Robinson, 2019) is that, for nations to thrive, a government should not grow too cumbersome and overshadow civil society. Sweden, according to its authors, is an example of how categories within civil society organized so as to be freer from government interference in a key aspect of economic life: income allocation. Income allocation occurs via (direct) distribution and (indirect) redistribution, and an important part of it is (gross and net) wage setting. If capital form a coalition with labor and they are cooperative in wage setting, in the sense that they agree upon a reasonably high wage, they can keep the government out of the process. In this way, indeed, there is less need for the government to perform its basic redistributive role, it gets more able to focus on other aspects of public provision, and has less room to get extractive,[13] with positive effects on development —which are called the *Positive-Sum Red Queen Effects*. In addition, for labor and capital to willingly enter their coalition, it is reasonable to think that their condition was improved by the coalition itself with respect to a more Pikettyian scenario wherein there is more redistribution via the state.

With this theory in mind, and after having tested its historical plausibility, we can check more formally what evidence has to tell about it. Our research questions will be two. According to the data, do nations with freer civil societies tend to achieve as a consequence better development outcomes? If so, and always according to the data, is it partly through improved gross wage setting, as a mechanism, that freer civil societies impact development outcomes positively?

To test these claims, we propose an econometrical framework wherein, with countries in the European Union as a sample, first of all, the effect of higher scores of the Civil Liberty Index during the decade 2008-2017 (`civil`) on income per capita in 2018 (`pcgdp2018`) is measured. The two variables are the proposed proxies for civil liberty[14] and development, respectively.

Income per capita in 2006 (`pcgdp2006`) is introduced as a control variable. This also helps methodology wise rule out reverse causality, as for example in Alence (2004). In this way, indeed, the possibility is controlled for that initial (pre-crisis) levels of the dependent variable in our regression, which again is an income variable proxying for development, may have had an impact on subsequent levels of the dependent variable itself and of the independent variable, the proxy for civil liberty, to begin with, before the latter had an impact on the former.

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[13] With respect to a hypothetical country-case in which gross income distribution was less fair but the required results were the same.

[14] A better description of the Civil Liberty Index can be found at the source, reported in the Appendix, part A. What is important to note is that the Index comprises, among others, aspects like the "extent to which private property rights are protected and private business is free from undue government influence" or the "extent to which the government invokes new risks and threats as an excuse to curb civil liberties" or whether "citizens are free to form professional organizations and trade unions".

As an additional control variable, an indicator of inequality in the income distribution is introduced, which measures the average income share accruing to the bottom 50% of the income distribution during the same decade as before (`bottom50_avg`). Indeed, not only the effects of civil liberty may differ across countries with different average (per capita) income levels, but also across countries with different income distributions.

Moreover, in order to control for other country characteristics that could drive the result, five sub-continental dummies are introduced for Scandinavia (`SCAND`), North-Western Europe (`NWEST`), the PIIGS (`PIIGS`), Eastern Europe (`EAST`) and the islands (`ISL`). [15] Results are reported in Table I below.[16]

TABLE I. The baseline regression

Dependent variable: Income per capita in 2018 (`pcgdp2018`)	
Regressors:	
Civil Liberty Index (`civil`)	5490.31
	(0.03)**
Low Pay Ratio (`lowpay`)	No
Income per capita in 2006 (`pcgdp2006`)	Yes
Bottom 50% income share (`bottom50_avg`)	Yes
Country-group controls (`SCAND`, `NWEST`, `PIIGS`, `EAST` and `ISL`)	Yes
Number of observations	27
R^2	0.91

A significant effect of civil liberty on development is detected. Given the broad manner the Civil Liberty Index is built in, however, with civil liberty also reflecting other functionings than those just related to income allocation (e.g., the freedom of the press or freedom from torture in a country), the impact on development we are measuring is not very neatly that of civil liberty *in income allocation*: it is the one of civil liberty broadly intended instead.

That is the reason why later, starting from this baseline econometrical framework, we have performed a mediation analysis, checking whether the detected effect is partly mediated by a variable, the Low Pay Ratio (`lowpay`), representing the share of wage earners earning a gross wage that is less than two thirds of the median (in 2018 or anyway in the most recent disposable year before the Covid Pandemic). If part of the effect was mediated by such a variable, in absence of other confounders,

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[15] See the Appendix, part B, for a classification of countries into country-groups.
[16] See the Appendix, part C, for the Stata output. Names of the variables in Stata are reported in parentheses in the table.

evidence would imply that civil liberty has an impact on development in part specifically through freedom from government interference in income allocation. Indeed, for labor to accept less government interference in the process of income allocation, thereby allowing it to be freer, capital has to pay well; which results in smaller Low Pay Ratios and a more compact gross income structure being likely correlates where this specific kind of civil liberty, freedom in income allocation, is increased relatively to other countries, as it was the case in Sweden. Results are reported in Table II below.[17]

TABLE II. Mediation analysis

Dependent variable: Income per capita in 2018	
Regressors:	
Civil Liberty Index (`civil`)	5229.36
	(0.05)**
Low Pay Ratio (`lowpay`)	Yes
Income per capita in 2006 (`pcgdp2006`)	Yes
Bottom 50% income share (`bottom50_avg`)	Yes
Country-group controls (`SCAND`, `NWEST`, `PIIGS`, `EAST` and `ISL`)	Yes
Number of observations	27
R^2	0.90

In numbers, roughly 5% of the general effect of civil liberty on development can be specifically attributed to freedom through income allocation. The two tables, indeed, show the results of mediation analysis: when the mediating variable `lowpay`, proxying also for the need of government involvement and thus possibly extraction, is introduced, the coefficient of civil liberty, representing its impact on development, decreases from about 5490 to 5229 dollars, which is roughly a 5% decrease. This percentage is an estimate of the relative importance for development of such a specific kind of freedom, freedom in income allocation, with respect to civil liberties more in general. The fact that it is a relatively small number come not as a surprise: as already noticed, the Civil Liberty Index registers freedom in a very broad, multi-faceted manner.

However, a problem is still there at this stage of the analysis: the Low Pay Ratio is also correlated with poverty and poverty may have an impact on development; two facts that together, in a form of omitted variable bias, would work as confounders and prevent us from isolating the specific impact we were looking for. To test our theory, we were, indeed, specifically looking for the impact on

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[17] See the Appendix, part C, for the Stata output. Names of the variables in Stata are reported in parentheses in the table.

development of freedom in income allocation through the specific channels involving the public sector; and not generally for that and additionally for the impact of civil liberty, through more or less poverty, on development —with the two impacts taken altogether.

---BOX 3. How omitted variable bias due to poverty is reduced in the estimate---------------------

One concern in the econometrical analysis is that, in settings where poverty is more widespread, civil society may be less able to substantially make the most of its formal liberty. For example, in a country where there is a good level of freedom of the press in principle, but newspaper agencies have no money enough in facts, how can media coverage be satisfactory and enhance development by improving transparency and accountability of politicians? In our European sample there are not so extremely poor countries as in other parts of the world, like Sub-Saharan Africa, but still the concern may be applicable to the comparison of countries with very different poverty ratios.

Since our measure of the need for redistribution in a country is a poverty ratio, the aforementioned concern could give rise econometrically to omitted variable bias due to poverty. In other words, in the regression we may not be measuring the impact on development of civil liberty through increased public provision or a government better in check (proxied by a fairer pre-tax income allocation which determines a lesser need for the ordinary redistributive function via the state), but we may in part be measuring the impact on development of civil liberty after controlling for poverty. In order to reduce this bias, that stems from the fact that our proxy of the need of less redistribution may be a signal of less poverty at the meantime, we have added a control for poverty in our two regressions. This assures that at least the income share accruing to the lower part of the income distributions of two countries in the sample to be compared is the same. Among the "other things being equal" of ceteris paribus analysis, in this way, there is also average poverty. However, two countries with a same income share accruing to the lower part of their income distribution, may still differ in terms of poverty structure in important ways. That is why we added an extra device to our methodology (see Figure 2 below).

Once roughly quantified the bias, we will be able to take it into account formally in our inference. This quantification is possible thanks to some knowledge about the shape of the gross wage distribution. The Low Pay Ratio will then represent the need for redistribution, cleaned by the bias due to different substantial capabilities associated with formal civil liberty under differently compressed wage structures, a bias quantified as the probability of randomly choosing a richer individual from the more compressed distribution than another random individual in the less compressed one. In future research, it would be good to go beyond the linear approximation made here and relax the assumption of symmetry of the gross wage distribution itself, by allowing for more flexibility, and thus for possibly more complex and realistic functional forms (involving skewedness,

lognormality, etc.). In particular, an extension of this work would be to take into account differences between countries in inequality patterns also in the upper part of the distribution, allowing them not to necessarily mirror the ones in the lower part of the distribution.
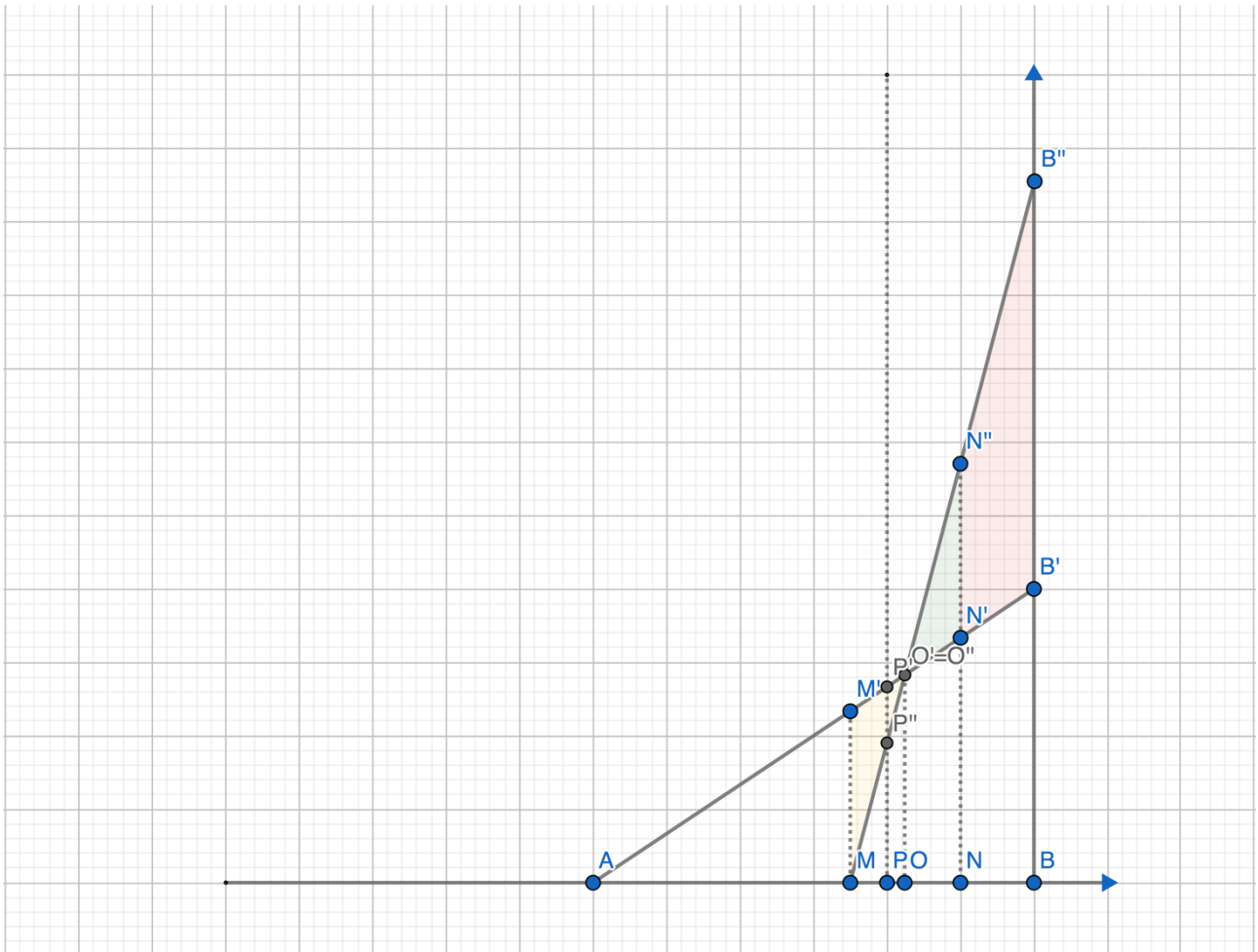
Figure 2 – **Magnitude of the bias due to poverty in a plot of income (x-axis) and population proportion (y-axis).**
A locates on the x-axis the zero-income threshold. The y-axis crosses the x-axis in B in correspondence with the median income. The line parallel to the y-axis and passing through P crosses the x-axis in correspondence with the "low pay" (2/3 of the median) income threshold. Note that the name of a point lays always up on the right of the point itself. It can be seen how the passage from one to the other of two different income distributions, one less compact (e.g., Germany), represented by the line AB', and the other more compact (e.g., Sweden), represented by the line MB'', implies a certain degree of improvement in terms of comparative poverty of individuals —given a same income per capita in the two cases (corresponding with the median income by assumption for simplicity). The ratio of the red area over the sum of the red area itself plus the green one quantifies the probability that, chosen one individual from the (more compressed) distribution "of arrival", he/she is richer than a comparison individual in the (less compressed) distribution "of departure". With the two triangles AB'B and MB''B equivalent in terms of area by construction, indeed, it can be seen how, under the second (more compact) distribution, there is a positive number of extra individuals who are richer than O: the segment O'B'' lays above the segment O'B'. The area in between these and the segment B'B'', which is thus delimited by the triangle O'B''B', represents how much the total extra probability in the second distribution is with respect to the one associated with the less individuals who are equally rich in the first distribution. However, a comparative worsening can also be observed in the same passage

across distributions. Some individuals in the second one, its poorest individuals, are actually less than the individuals as rich as them in the first distribution: the segment MO' lays below the segment M'O'. The area of the triangle MM'O', which is equivalent by construction to the area of the triangle O'N''N', represents how much is the total missing probability suffered because of less individuals in the second distribution with respect to the probability associated with the more individuals who are as rich in the first distribution.

The difference between the two areas OB''B' and O'N''N', which is delimited by the quadrilateral N'N''B''B', hence, represents the total amount of the extra probability associated with the more individuals in the second distribution that is not compensated by a missing probability suffered because of the less individuals in the second distribution enjoying same incomes (with respect to counterparts in the first distribution). This means that the area of such a quadrilateral gives us an idea of the average magnitude of the net improvement in terms of comparative poverty implied by the passage from the less compact distribution to the more compact distribution. This net improvement represents a bias for the purposes of our estimation, in that, in order to interpret the effect of civil liberty, through public sector channels, on development more correctly, we would need this area to be null, with all the gain in terms of comparative poverty, in the passage across income distributions, compensated by an equivalent loss. In this way only, we would be able to exclude that the estimated effect is due to differences in comparative poverty and interpret the effect itself as due to the public sector channels instead (recall that the effect through the public sector channels is just what we would have liked to isolate and prove to be there, if possible). In the passage across income distributions, the larger is the non-compensated (net) gain in comparative poverty, the larger is our estimation bias; the larger is the extent to which the gain in comparative poverty is compensated, the smaller is our estimation bias. Exploiting this fact, and thus looking at the relative magnitude of the bias under different circumstances, we can infer more correctly and go forward in the direction of an unbiased estimate of the effect (to be estimated in order to corroborate or reject the theory). When comparing two differently compressed income distributions, the proportion of the area representing the bias with respect to the total area representing extra income can theoretically vary from 0, in which case extra income for some income levels is entirely compensated by missing income for others, to 1, in which case extra income is not compensated at all. See the Appendix, part D, for more details about calculations.

Once taken also this bias into account, we are ready to interpret our results more causally. This interpretation comes, after calculations that are specific to the choice of a country and thus of the associated "jumps" in civil liberty and relative poverty, that we need to hypothesize in a what-if analysis, in order for that country to adhere to the Swedish Model more fully.

To give a numerical example, should my country —Italy— have implemented a reform with Sweden as a model in 2018, thus increasing civil liberty from 8.2 to 9.4 out of 10 points, we have estimated it would gain roughly 5490 euros per capita, ceteris paribus, from every one-point increase in civil liberty. Of this gain, however, only 261 euros would be really obtained, by increased civil liberty, through differences related with the income allocation process, in particular differences in the gross wage structure (the Low Pay Ratio was at 4% for Italy and at 3% for Sweden).

As argued above, this theoretical gain specifically obtained on average from increased civil liberty through variations in gross wage structure, should be "cleaned" because in part reflects the reduction of relative poverty that would result from the reform and/or to other variations in relative poverty, and only in part effectively reflects variations due to the public sector channels (more public provision

and/or a better-in-check public sector, due to less redistribution). Having computed that the first effect, the one through variations in relative poverty, is near 5% in this case,[18] for an increase of the Civil Liberty Index of 1.2 points, the gain for Italy effectively due to public sector channels, would be around 298 euros per capita. In a country of more or less 59 million people, this means that the gain for the nation would reach the threshold of 17 billion euros. To have an intuitive grasp of what this would mean, consider that it is more than the yearly expenditure in military forces by the Italian Ministry of Defense, which amounts to less than 13 billion euros in total.[19] In sum, with a conservatively high marginal cost of public finance at 1.5 (Bastani, 2023), such a reform would mean that, for example, the pressure on the Italian public budget due to expenditure in military forces could almost entirely (87%) be eased. It is not a negligible gain.

Italy is a country with a relatively close wage structure to the one Sweden. More towards the other side of the spectrum, France, with a similar score of the Civil Liberty Index in 2018 (8.5 points out of 10), had a pretty much less compressed wage structure, the Low Pay Ratio (10%) being more than three times higher than the Swedish one. Should France, with a population of more or less 68 million people, implement a reform and reach the Swedish standards too, with a poverty bias computed at 30%,[20] the gain is estimated at more than 11 billion euros. In sum, again with a conservatively high marginal cost of public finance at 1.5 and once accounted for inflation in the last couple of years,[21] thanks to such a reform, for example, the recent 10-billion public expenditure cut that France has had to announce (this year in February), in order to meet its goal in terms of deficit/gdp ratio,[22] could have been almost entirely (90%) avoided. Again, to say that it is not a negligible gain.

Despite just a fraction of the impact of civil liberties in general, specifically having more civil liberty in the sense of stronger constraints on government involvement in income allocation, still seems a source of non-negligible increases in income for citizens in Europe. This body of evidence is in favor of our theory. It is important to remark, however, that, besides benefits captured by income per capita as a metric, there are other benefits, not necessarily captured in a complete way by the metric itself, that would follow from embracing the Swedish Model. Important ones are low relative poverty and high-level public provision; but also a balance in the distribution of power may exceed the economic gain strictly intended. All these factors are considered by Myrdal (1974) as components of development conceived in a satisfactorily broad manner, when he refers to it as the "movement

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[18] Following the methodology illustrated in Box 3. See the Appendix, part D, for more details.

[19] https://www.difesa.it/assets/allegati/2569/2a09f43d-8fec-4650-83f6-39f0e56750c5.pdf At page I-5 of this official document by the Italian Ministry of Defense, in the table, it can be read how expenditure for the military personnel was around 9 billion euros in 2018.

[20] Following the methodology illustrated in Box 3. See the Appendix, part D, for more details.

[21] https://www.inflation.eu/en/inflation-rates/france/historic-inflation/cpi-inflation-france.aspx

[22] https://www.lemonde.fr/en/france/article/2024/02/22/france-announces-10-billion-euro-budget-cuts-as-growth-slows_6548218_7.html

upward of an entire social system". Where the social system should be intended to include "generally economic, social and political stratification", in particular "the distribution of power in society", and "consumption provided collectively", like "education and health".

V. 1 Some empirical evidence. A wrap-up

To sum up our econometrical analysis, our main theoretical claims have been supported by empirical evidence. It has been found out that, indeed, the impact of civil liberty on development in part runs through something happening at the gross income allocation level; something which is different from the outcome of the process in terms of poverty. We argue that this *something* is represented by a feature of the process of income allocation itself: freedom from government interference. When income allocation remains more an affair between major categories within civil society, and the government has to perform less basic redistribution, it can focus more on other aspects of public provision and is more "shackled", as in Acemoglu and Robinson's theory, ceteris paribus. As a consequence, their Positive-Sum Red Queen Effects are produced, as partly reflected also by development outcomes narrowly defined in terms of economic performance (GDP). Similarly, in cases in which a shift to higher scores of civil liberty happens within a country, our findings make us think that, for parties within civil society, entering their coalition should mean an improvement of the conditions that they would otherwise experience. In particular, capital would have to be worse off in the absence of the coalition with labor, and this may be due to the fact that in such a counterfactual scenario labor would enter a coalition with the government and manage to organize heavier redistribution via the state in the Pikettyian fashion. Overall, the presented findings also help rationalize why democracies sometimes could deliberately opt for a shift to higher scores of civil liberty and fairer gross income distributions.

VI. Conclusion

Piketty (2014) depicts a scenario wherein inequality as a general rule tends to increase in the contemporary world under the forces of capitalism, unless there is some major exceptional event occurring, like some form of stronger redistribution of income, through taxes and transfers, performed by a public sector that grows larger for particular reasons in history.

Acemoglu and Robinson (2019) argue something apparently different. In their theory, a public sector that grows larger and larger is seen as problematic. It is by limiting its growth that nations manage to thrive in their quest for development. More in particular, with Sweden as a model in history, they suggest that when income allocation took the form of being freer from government interference, as an affair more between workers and employers, the consequences were positive for the nation. This, however, can only happen where there is low gross inequality and workers are happy with how much they already receive from employers. In this sense, theirs is a theory in which relatively low gross income inequality, through less need for redistribution, less government intervention required ceteris paribus, and thus less room for the government to get extractive, leads to a more balanced national structure, where "the Leviathan" is shackled and civil society is not oppressed —which is ultimately functional for development.

This other causal path, then, runs from low gross income inequality to development, through a *smaller* public sector. A larger one is not wished like in Piketty (2014) as a backstop to the capitalistic tendence to inequality. Rather, it is by cooperative forces within a capitalist civil society that inequality is fought, and without the need to resort to heavier regulation. Actually, it is thanks to the avoidance of this drastic solution that in the end not only low inequality is achieved anyway, but also development objectives are better met. Nevertheless, as we have pointed out, for that to be the case, an implicit condition may have to be met: that in the absence of cooperation with employers, workers can credibly threat to cooperate with the government. It is probably in order to avoid cooperation of this second kind (à la Piketty) that cooperation of the first kind (à la Acemoglu/Robinson) arises.

In this piece of research, with this "unified theory" in mind, we have done three things. First, we have formalized its main propositions in a model with the help of game theory. Second, we have verified that the model is well applicable to the history of Sweden. Third, we have gathered some additional evidence, coming from econometrical analysis, in favor of the idea that nations with a freer civil society, that directly takes care of inequality within its parties, and a less pervasive government, at least in the specific field of income redistribution, perform economically better.

Regarding the first contribution, our model —a three-player game, in the mathematical sense, between a Governor, a Laborer and a Liberal, with universal (i.e., between all players) non-cooperation as a zero-payoff Nash equilibrium— formalizes the concept of a Lib-Lab coalition,

superior in terms of total payoffs to a Gov-Lab coalition. In particular, the first coalition leads to the same result as the second for the Laborer while additionally delivering him/her more public goods, because the Governor is kept more under control, thus avoiding extractive drifts by him/her. It is superior for the Liberal too, who benefits from a non-protesting Laborer and, by paying him/her (well) directly, enjoys the increased public good provision as well and does not undergo extra extraction by the Governor for redistributive purposes either. For the Governor, it is superior as well, even though requiring him/her to renounce to get extractive, because it delivers a non-protesting Laborer and also a compliant Liberal. Despite being socially superior, the Lib-Lab coalition is unstable in absence of other cooperative schemes, because the Laborer and the Liberal have conflicting goals and are both incentivized to defect while the other is cooperating. The Governor, on his/her behalf, is incentivized to defect as well, free-riding on other players, which is relatively difficult, though, in presence of a coalized civil society.

These dynamics in the game are all well represented in the history of Sweden. The second contribution of our research is having clarified how historical outcomes there, like equality and development, can be explained by the mathematical model, built starting from assumptions that it makes sense historically to start from. In order to better do this, in some cases we have also complemented and improved the brief history of the Swedish model by Acemoglu and Robinson (2019), relating with former literature. What emerges is that the Swedish corporatist model has deep historical roots (although probably not as ancient as a narrative would make us think) and that relevant attempts to circumscribe the role of the government are recorded in the country's history.

In the third place, in this study we have econometrically tested that greater civil liberty, (also) through less heavy redistribution via the state, tends to enhance development in a country. It is likely that achievements in terms of civil liberty were politically feasible in democracies only where workers did not feel the need to resort to the other possibility of theirs, the one of calling for more redistribution via the state. This also implies that employers wanting to keep the public sector out of income allocation, had to keep up with demands by workers themselves, demands which were probably higher where workers had higher-level outside options, in countries like Sweden, with stronger labor movements.

Overall, not only would such a Red-Queen kind of dynamic, in the jargon of before, be conducive for lower inequality within civil society in some countries, but would also allow for more public provision in those countries for a given level of fiscal withdrawal and help keep their government better in check, eventually being positive-sum for their nations' development. Same concept phrased differently, the one through more public provision and a government better in check is a potential pathway through which gross income equality is functional for development; and, conversely,

through less public provision and a government worse in check, gross income inequality is disfunctional for it.

In sum, the historical experience of Sweden and recent patterns in the most similar countries to it in the European Union both point towards a potential way for other countries to develop. With development not just strictly intended as the achievement of high income per capita, but intended, more broadly, as that plus the achievement of low relative poverty rates and the achievement at the same time, and safely from the point of view of the non-extractiveness of institutions, of high-level public provision —what we may altogether retain as a good definition of the "full development" of a nation. This trajectory strongly recalls what Myrdal (1974) considered the only satisfactory definition of development, namely the "movement upward of an entire social system".

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---Appendix---

A. Data sources

Data for income per capita in 2018 and 2006 are from the *Maddison Project Database 2020*.

https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2020?lang=en

Data for the Civil Liberty Index are from *Our World in Data*.

https://ourworldindata.org/grapher/civil-liberties-index-eiu?tab=table

Data for the bottom 50% income share are from the *World Inequality Database*.

https://wid.world/data/

Data for the Low Pay Ratio are from *ILOSTAT*.

https://rshiny.ilo.org/dataexplorer58/?lang=en&id=EAR_XTLP_SEX_RT_A

B. Classification of countries into country-groups

Country-group	Country
SCANDINAVIA	Denmark
	Finland
	Sweden
NORTH-WESTERN EUROPE	Austria
	Belgium
	France
	Germany
	Luxembourg
	Netherlands
PIIGS	Ireland
	Italy
	Greece
	Portugal
	Spain
EASTERN EUROPE	Bulgaria
	Croatia
	Czech Republic
	Estonia
	Hungary
	Latvia
	Lithuania
	Poland
	Romania
	Slovakia
	Slovenia
ISLANDS	Cyprus
	Malta

Characteristics that countries in a same group may have in common are many. Notably, countries in Scandinavia are well-known for their strong public sectors; countries in North-Western Europe have historically solid economies; countries notorious as PIIGS had severe problems with debt sustainability in the aftermath of the crisis; countries in Eastern Europe share a recent history of communism.

C. STATA output

Table I. The baseline regression

Source	SS	df	MS			
Model	3.1951e+09	7	456447198	Number of obs	=	27
Residual	237279913	19	12488416.5	F(7, 19)	=	36.55
				Prob > F	=	0.0000
				R-squared	=	0.9309
				Adj R-squared	=	0.9054
Total	3.4324e+09	26	132015781	Root MSE	=	3533.9

pcgdp2018	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
civil	5490.31	2259.143	2.43	0.025	761.8691	10218.75
pcgdp2006	1.003254	.1348767	7.44	0.000	.7209539	1.285554
bottom50_avg	-14638.35	37216.61	-0.39	0.698	-92533.6	63256.91
SCAND	-4187.238	3852.83	-1.09	0.291	-12251.3	3876.828
NWEST	-406.8067	3685.206	-0.11	0.913	-8120.031	7306.418
PIIGS	-3049.757	3244.073	-0.94	0.359	-9839.68	3740.165
EAST	4750.69	3009.567	1.58	0.131	-1548.405	11049.79
ISL	0	(omitted)				
_cons	-43333.63	19317.85	-2.24	0.037	-83766.36	-2900.896

Table II. Mediation Analysis

Source	SS	df	MS			
Model	3.1961e+09	8	399511428	Number of obs	=	27
Residual	236318873	18	13128826.3	F(8, 18)	=	30.43
				Prob > F	=	0.0000
				R-squared	=	0.9312
				Adj R-squared	=	0.9006
Total	3.4324e+09	26	132015781	Root MSE	=	3623.4

pcgdp2018	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
civil	5229.359	2509.125	2.08	0.052	-42.11743	10500.83
lowpay	64.47928	238.3211	0.27	0.790	-436.2147	565.1732
pcgdp2006	1.005596	.1385624	7.26	0.000	.7144873	1.296705
bottom50_avg	-11321.27	40080.11	-0.28	0.781	-95526.46	72883.92
SCAND	-7959.401	5136.223	-1.55	0.139	-18750.2	2831.402
NWEST	-4540.676	3972.3	-1.14	0.268	-12886.17	3804.816
PIIGS	-7028.311	4018.723	-1.75	0.097	-15471.34	1414.713
EAST	0	(omitted)				
ISL	-4383.839	3370.53	-1.30	0.210	-11465.06	2697.382
_cons	-38272.94	18710.95	-2.05	0.056	-77583.19	1037.319

D. Omitted variable bias due to poverty. Calculations

The OVB due to poverty was calculated following the methodology in Box 3, as the red area N'N''B''B' in Figure 2 (which is equivalent by construction to the area of the white triangle AM'M), over the total area of the triangle PB''B' (which is equivalent by construction to the area of the triangle APM).

This can be viewed as a quantification of the probability that a random individual in the second (more compressed) distribution is richer than a random individual in the first (less compressed distribution). Indeed, it is a simplification of the formula

$$\frac{AM'M + N'N''B''B'}{AM'M + N'N''B''B' + MM'O' + O'N''N'} = \frac{2N'N''B''B'}{2N'N''B''B' + 2O'N''N'} = \frac{2N'N''B''B'}{2(N'N''B''B' + O'N''N')} = \frac{N'N''B''B'}{PB''B'}$$

When in possess of this ratio as a percentage, the total effect estimated from the regressions in Table I and II, which amounted to € 261 per capita for every one-point increase in the Civil Liberty Index, has been reduced by the percentage itself, due to the bias. The idea is that, in absence of the bias, the estimated effect would be fully at work due to our public channels of interests; if the effect were completely due to the bias, the effect due to our public channels of interest should be estimated as zero; in cases in between, the less it is reduced by the bias, the larger, in proportion, the estimate of the effect of interest should be.