



Universidade Federal do Rio de Janeiro
Instituto de Economia
Programa de Pós Graduação em Economia da Indústria e Tecnologia

Armando Nogueira da Gama Lamela Martins

ECONOMICS OF RULE OF LAW: HOW TO DESIGN IT AND HOW THE PEOPLE
REACT TO IT

Rio de Janeiro
2023

Armando Nogueira da Gama Lamela Martins

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Tese de Doutorado apresentada ao Programa de Pós-Graduação em Economia, Instituto de Economia, da Universidade Federal do Rio de Janeiro, como parte dos requisitos necessários à obtenção do título de Doutor em Economia.

Orientador: Pedro James Frias Hemsley

Rio de Janeiro
Setembro de 2023

M386e Martins, Armando Nogueira da Gama Lamela
Economics of Rule of Law: How to design it and
how the people react to it / Armando Nogueira da
Gama Lamela Martins. -- Rio de Janeiro, 2023.
162 f.

Orientador: Pedro James Frias Hemsley.
Tese (doutorado) - Universidade Federal do Rio
de Janeiro, Instituto de Economia, Programa de Pós
Graduação em Economia, 2023.

1. Rule of Law. 2. Justice Design. 3. Conflicts
and Development. 4. Inequality. I. Hemsley, Pedro
James Frias, orient. II. Título.

Acknowledgements

Dissertation is not merely a final text; it is a journey that involves numerous individuals providing both professional and emotional support. Conducting research during a pandemic is no small feat, considering the emotional challenges life throws at us. Expressing gratitude to those who have assisted me in this endeavor is an attempt to encapsulate, in words, the appreciation for their contribution to my personal and professional growth.

First and foremost, I would like to extend my heartfelt gratitude to my advisor, Prof. Pedro Hemsley. Our profound discussions on research and career have constantly motivated me to strive for excellence. I am certain that your guidance has shaped me into a compassionate and productive scholar.

A big thank you to Prof. Flavio de Moraes for his insightful feedback on this work and for being a personal inspiration in pursuing a career in law and economics with cutting-edge research. I also extend my gratitude to Prof. Paulo Corval and Prof. Eduardo Val, who have accompanied and motivated me since my undergraduate days.

To my closest colleagues at IE-UFRJ, namely Maria Eduarda, Fernanda, Mateus, Mariana, Danielle, Pedro, Lívia, Laura, Andrea, Danielle, and Matheus, I am immensely proud of our network of self-help and emotional support throughout our time in graduate school.

I would also like to express my appreciation to the individuals who warmly welcomed me at the European University Institute. My sincere thanks to my supervisor, Prof. Andrea Ichino, as well as the leaders of the political economy working group, Prof. David Levine and Prof. Zeinab Aboutaleb. I am grateful to the kind administrative staff, Martina and Lucia. To my fellow Ph.D. friends, Olatz, José, Miguel, Alaitz, Piotr, Dalila, Belén, Philip, Yannick, Marcin, Thomas, Nicole, Konuray, Christina, Jan, and the post-docs, Weiwei, Umberto, Junze, and Asli, I wish you all the best in your careers!

Furthermore, I would like to acknowledge the scholars I encountered in Italy who expressed great interest in my research: Prof. Diogo Britto, the post-docs Manoel Gehrke in Bocconi, and Umberto Nizza in Verona. Special thanks to Prof. Mounu Prem, one of my main references for the Collective Memory paper, whom I met during a Bocconi seminar. I am grateful for his valuable feedback on this work. I would also like to extend my gratitude to Prof. Paolo Pinotti, who graciously welcomed me during the Transatlantic Workshop on Economics of Crime and invited me to join the post-workshop dinner. Lastly, a

special shout-out to my brilliant friend Lucas Warwar, who came to my aid when I found myself locked in the restaurant bathroom that night!

To Profs. Mireille Razafindrakoto and François Roubaud, who invited me to visit IRD-Dial, Profs. Valeria Pero and Anne Sophie Roubillard for their assistance throughout the process, and Prof. Thomas Calvo, who served as my supervisor at the institute, thank you for your support. I am grateful to Profs. Marion Mercier, Sandrine Mesplé-Somps, and Sidartha Gordon for their kind and enlightening comments on my research. Additionally, I would like to thank all the Ph.D. students I had the pleasure of meeting: Mathilde, Antoine, Alexandre, Jeanne, Yvan, Santiago, Mathilde, Camille, Olivia, Adrien, Cecile, Florence, Andrea, and Charli... Your warmth and genuine interest during my stay were truly appreciated, and I hope to reunite with you soon for a game of pétanque and a glass of Pastis at Canal Saint-Martin!

Last but not least, I extend my gratitude to all my friends at Fiaschetteria de La Cure, and especially to the kind waitress who, on my final day there, raised a glass of wine with me to democracy.

I would like to express my gratitude to Profs. Laura Schiavon, Laura Karpuska, Gabriel Cepaluni, Luis Martinez, and José Pereira dos Santos for their kindness in providing informal feedback on my work and encouraging me to pursue an international career.

To Jamil Civitarese, Ingrid Xavier, Arthur Pacheco and all my personal friends who are scattered across different social circles and weird chat groups, I am truly grateful to have found such a nurturing and supportive environment among you all.

To my family, including Armando, Ygara, Paulo (father and son), Mauriane, Airton (father and son), and Patrícia, thank you for your unwavering presence and support throughout this journey. To my beloved girlfriend Gabrielly, you have made our busy lives together so much sweeter and lighter. I love each and every one of you!

Lastly, I want to dedicate a special mention to my mother Mauriza (in memoriam). She taught me the values of diligence and kindness. I hope that wherever she is, she can see and take pride in my accomplishments. I am certain that the candle still flickers in the Chiesa di San Lorenzo in Poggibonzi, a testament to the eternal flame of love and remembrance. Thank you, Mom.

Arthur: I am your king!
Woman: Well I didn't vote for you!
Arthur: You don't vote for kings!
*Woman: Well how'd you become
king then? (holy music up)*
*Arthur: The Lady of the Lake - her
Arm clad in the purest shimmering
samite Held aloft Excalibur from
the Bosom of the water, signifying
by Divine providence that I, Arthur
Was to carry Excalibur THAT is
why I am your king!*
*Man: (laughingly) Listen: Strange
women lying in ponds distributing
swords Is no basis for a system Of
government! Supreme executive
power Derives from a mandate
from the masses Not from some
farcical aquatic ceremony!*
*(Scene from Monty Python - Monty
Python and the Holy Grail)*

RESUMO

MARTINS, Armando Nogueira da Gama Lamela. **Economics of Rule of Law: How to design it and how the people react to it.** Rio de Janeiro, 2023. Tese (Doutorado). Programa de Pós Graduação em Economia, Instituto de Economia, Universidade Federal do Rio de Janeiro. Rio de Janeiro, 2023.

O pano de fundo desta tese aborda a convergência entre economia e direito a partir dos anos 50. A teoria dos jogos trouxe mais nuance na discussão sobre o objeto das ciências econômicas, expandido o conceito sobre alocação de recursos para também abarcar o estudo dos incentivos sociais. Essa aproximação é relevante para desenhos jurídicos em sociedades regidas pelo Estado de Direito, em que a legislação é formulada com base nas preferências sociais. A economia pode auxiliar o direito na avaliação dos incentivos e estratégias dos agentes diante de desenhos legais.

Foram realizados três exercícios aplicados: o primeiro aborda o assédio em contratos de trabalho e como diferentes estruturas judiciais podem mitigar o problema. A justiça punitiva se mostrou eficaz na neutralização do dano causado pelo assédio. O segundo exercício analisou empiricamente os incentivos para protestar e votar por uma nova constituição no Chile, considerando o abuso da aplicação da lei e a memória coletiva da repressão estatal durante o regime militar. Os resultados indicaram que, onde a memória da repressão é mais viva, há mais protestos contra a violência, mas menos apoio à reforma política. O terceiro exercício investigou a relação entre democracia e desigualdade na Argentina, um país com histórico de transições de regime. Evidências quantitativas e qualitativas sugeriram que, além do conflito distributivo, incentivos constitucionais levam à políticos com visão de curto prazo e redistribuição de recursos para as províncias de classe média com fins eleitorais.

ABSTRACT

MARTINS, Armando Nogueira da Gama Lamela. **Economics of Rule of Law: How to design it and how the people react to it.** Rio de Janeiro, 2023. Ph.D. Dissertation Graduate Program in Economics, Institute of Economics, Federal University of Rio de Janeiro. Rio de Janeiro, 2023.

The background of this thesis is the idea of bringing together the topics of economics and law from the 1950s onwards. Literature on the history of economic thought indicates that the advent of game theory led to an expansion on the focus of economics from not only resource allocation to also the study of social incentive design. In this sense, economics approaches law insofar as the latter also deals with the design of incentives, although with a greater emphasis on normative discussions. This convergence becomes even more relevant when it comes to legal frameworks in societies governed by the rule of law, as the principle of legislation formulation is not arbitrary rule by the ruler, but the accommodation of social preferences. Economics, in this sense, can assist law by providing analytical and empirical tools to evaluate the consistency of incentives in achieving the intended outcomes from the perspective of the law creator or to identify the strategies of agents given the implementation of a legal framework.

Based on this background, two applied exercises were conducted: the first one describes, using a variation of the traditional moral hazard model, the issue of workplace harassment in employment contracts and how different court designs can mitigate these effects. In this case, it was found that harassment is a significant problem that obscures contractual risk, but punitive justice, rather than restorative justice, is effective in statically neutralizing the harm caused by harassment. The second exercise involved empirically analyzing the incentives to protest and vote for a new constitution from the perspective of the Chilean population in the context of abusive law enforcement and taking into account the collective memories of state repression during the Pinochet military regime. The results indicated that where memories of repression are more vivid, the Chilean population protests more against violence but votes less for political reform. The third exercise, in turn, was based on investigating the relationship between democracy and inequality in the case of Argentina, a country with a history of a high number of regime transitions. Quantitative and qualitative evidence suggested that, in addition to pronounced distributive conflict, constitutional incentives lead to short-sighted politicians and a redistribution of resources to middle-class provinces for electoral purposes.

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Chapter 1

Economic and Legal studies as an art of choice incentives design

The underlying proposition of this thesis is to present the discipline of law and economics from the perspective of incentives regarding the balance of power among different social actors. The literature on the definition of the discipline of Economics ¹ often emphasize that in the evolution of 20th-century economic thought, there was a expansion in the scope of what is the subject of economic analysis. With the advent of game theory in the 1950s, a great interest in modeling interactive agents led different areas of economics to consider not only studying optimal interventions but also taking into account how the agents involved would react to these interventions. For this reason, the traditional view of economics as the science of optimal resource allocation allows more room for the idea of economics as a discipline that aims to study the choices and incentives of economic-social agents for cooperation, competition, or conflict over resources.

In this sense, it is possible to analyze how the disciplines of law and economics converge. Just like different areas of economics, the traditional literature of law and economics proposed that legal operators would act as resource allocators, and therefore, the object of the discipline would be to study the optimization of this allocation from the perspective of these operators [5]. The intersection of law and economics, considering economics in its most generalized object, became possible with the incorporation of institutional economics [6] and the emergence of the law and development movement [7]. It can be argued that law and economics converge in this more generalized mode since law is also a discipline that is dedicated to analyzing the design of incentives in a legal environment – although law allows normative considerations regarding the design and incentives. This importance in the study of incentives in Law becomes more relevant when it comes to societies where the legal system follows the principle of the rule of law, as the formulation of legislation must be objective and reflect social preferences normatively,

¹See, for instance the discussion in BACKHOUSE e MEDEMA [1], SAMUELSON [2], MYERSON [3], LAFFONT e MARTIMORT [4]

and not merely the ruler's whim [8].

In this panorama, economics as the science of incentives assists law by providing analytical and empirical tools to evaluate the consistency of incentives designed in legal systems in order to achieve the intended results by legal operators. On the other hand, law assists economics not only in studying in a generic way how institutions matter but also in describing in-depth what these institutions are, not only in their formal content but also in the interpretation of the formal text and the intended purposes in their formulation.

The discipline of law and economics, in this interaction, ends up having a special proximity to the discipline of political economy by seeking the context of power relations involved in the formulation of legal relations. Most of the discipline of political economy focuses on studying the management of political power, such as elections, dictatorships, conflicts, lobbying, with still unexplored room for studying the formulation and application of laws and their content. Law not only has the ability to shape the balance of power among different social agents but is also conditioned by this balance of power when formulating legal propositions [9]. In this sense, incorporating the identification of the balance of powers involved not only in the jurisdictional agents but also in the designer of positive incentives in law is a relevant exercise in the analysis of incentives in the cooperation, competition, or conflict of social agents.

Based on this background, the next two chapters focus on three applications that aim to identify incentives and comparative rule-of-law designs:

The first application, presented in the next chapter, describes the issue of workplace harassment in employment contracts, using a variation of the traditional moral hazard model. Harassment is defined as an improper activity imposed on the agent that is non-contractible but fully observable by the boss. Additionally, court designs are proposed to mitigate these effects. The first design is based on punitive justice, which involves the punishment of non-compliance with state legislation. The court has a probability of verifying the contract, identifying harassment, and neutralizing the benefits of the boss from engaging in improper activities. In the second design, based on the concept of restorative justice, the aim of the court is to repair the damages felt by the victim. Therefore, they have a probability of verifying the contract, identifying harassment, and not only neutralizing the benefits of the boss from engaging in improper activities but also alleviating the costs borne by the employee due to the improper activity. In this setting, it was found that harassment is a significant problem that obscures contractual risk. However, punitive justice, rather than restorative justice, is effective in statically neutralizing the harm caused by harassment.

The second application involves the empirical analysis of the incentives to protest and vote for a new constitution from the perspective of the Chilean population, considering abusive law enforcement and taking into account the collective memories of state repression during the Pinochet military regime. Collective memory is a concept borrowed from

sociology to describe the information about historical events that is passed from survivors to the whole society and becomes a social institution. State violence has plagued Chilean history during the military dictatorship in the 1970s and 1980s, and discussions about the social memory of this violence and the lack of holding the perpetrators accountable persist until the present day. After an episode of police violence against students in 2019, Chile faced one of the largest waves of protests in the history of the Global South, known as the Estallido Social, which led to a new constitution initiative. This study utilizes a database on Pinochet's repression, the number of protests during the Estallido Social, and electoral data on the constitutional plebiscite processes. It relies on exogenous variation in the placement of military bases before 1970 to understand the effect of past repression on contemporary political behavior. For the mechanism analysis, a metric of collective memory is proposed, which uses the number of Twitter accounts remembering the violence of the military coup during its anniversary. The results indicate that where memories of repression are more vivid, the Chilean population protests more against violence but votes less for political reform.

In the third exercise, the egalitarian aspect of democracy is explored within the context of Argentina, while considering the political and institutional characteristics of Latin America. The results indicate a persistent correlation between the democratization process in Argentina and the increase in economic inequality. However, there is also evidence of a growing proportion of income being allocated to workers. The qualitative historical examination suggests that, alongside other factors like wage dispersion resulting from economic shocks, there is a constitutional incentive for income redistribution aimed at appeasing the middle class provinces for electoral purposes.

The results overall suggest a cautionary tale regarding the use of the legal system to reduce or promote disparities in power imbalances, which may affect the dynamics of social cohesion.

Chapter 2

Justice design against harassment at labor contracts

Alternative forms of justice have been the focus of policy evaluation in recent times, particularly in addressing the problem of harassment in the workplace. Harassment in the workplace is a significant issue that affects how people work and cannot be ignored. Different forms of justice can impact the well-being of labor relations. In this paper, I propose a special case of formal moral hazard model in which a multitask agent is assigned to carry out proper tasks but is also subjected to harassment by an abusive boss to perform improper tasks. Improper tasks are not contractually binding but are observed by the boss; courts can verify them through punitive justice and restorative justice. Punitive justice here is defined as when courts neutralize the boss' payoff on improper activities; Restorative justice is when the court neutralizes the boss' payoff and alleviates the agent's cost on improper activities. The model suggests a cautionary tale: improper tasks can be an ever-present issue and mask the problem of contract risk. Punitive justice can mitigate the incentive to harass, but restorative justice does not improve welfare in this setting.

2.1 Introduction

Policy evaluation of criminal justice interventions has moved beyond the cost-benefit analysis of traditional forms of punishment such as imprisonment, fines [10, 11], or death penalty [12], and has embraced also other forms of dissuading wrongdoings. For example, the effectiveness of measures such as agreements not to prosecute misdemeanors [13], sex offender registries [14, 15], DNA registries, employment programs, and psychological therapy for convicted individuals has been examined [16].

One way that justice systems can differ is by the extent to which different legal doctrine is applied. There has long been debate over the restorative or punitive nature of justice. In traditional literature, the concept of restorative justice focuses on the victim's

perspective, seeking to heal the harm suffered and reintegrate the offender into socially positive behavior. In contrast, the concept of punitive justice emphasizes the idea of a legal offense as a violation of state rules [17, 18]. However, evidence of the effectiveness of this approach is positive only for some offenses [19, 20]. Legal experts also discuss the use of restorative justice as an alternative to punitive justice in cases of sexual harassment [21]. In such cases, restorative justice programs often involve psychological support for both the offender and victim, with the aim of: 1) acknowledging the offense, 2) the offender taking responsibility, 3) repairing the harm, 4) committing to not repeat the offense, and 5) redemption and reintegration [22].

Harassment in the workplace affects how women work and cannot be ignored. Sexual harassment is not only understood as harassment for sexual favors, but also as a broad category of harassment for tasks that reinforce gender roles. For example, people may harass women to do “womanly” tasks unrelated to their contracted job [23], such as a developer cleaning up the office. Harassment is a reality for many workers: according to BATUT *et al.* [24], 12 percent of women in France reported being harassed in the past 12 months, and according to FOLKE e RICKNE [25], a similar percentage was found in Sweden.

The canonical literature on harassment [26] emphasizes the power dynamic between male bosses and female workers as a primary source of harassment. More recent studies in developed countries also show the existence of harassment of female bosses [23] and between colleagues [24]. Organizational issues can exacerbate the problem of harassment and increase work inequality [23, 27].

According to MCDONALD [28], the literature on the psychology of sexual harassment indicates that its impacts range from “irritation and anxiety to anger, powerlessness, humiliation, increased risk of alcohol abuse and eating disorders, depression, and post-traumatic stress disorder”. However, effective deterrence of harassment threats can increase overall productivity [29]. Given the individual and social issues caused by harassment in the workplace, it is crucial to consider how the legal system can be designed effectively to address improper conduct within labor relations.

In this paper, I examine how harassment affects performance measures in moral hazard labor contracts. To do this, I develop an analytical model similar to the canonical analysis of MACKINNON [26], in which an abusive male boss harasses his female worker to perform improper activities. Different designs of justice are studied in relation to harassment: punitive justice, which only verifies and reduces the payoff to the principal from harassment; and restorative justice, where the court verifies harassment and neutralizes the principal’s benefit and reduces the costs to the agent.

The main objective of this work is to make contributions to the fields of contract theory, labor economics, and law and economics. In traditional literature on contract theory (e.g., see BOLTON e DEWATRIPONT [30]), multitask agents are often used for

activities that are contractible but non-observable. However, in this model, the opposite is true. Improper activities are based on a task that is non-contractible but observable by the boss (although not necessarily by a court of justice). Additionally, a major goal of this model is to understand the mechanism behind the idea presented in CICI *et al.* [29] that access to justice can help to reduce the harm caused by harassment and improve contract welfare measures.

To do so, the model utilizes basic assumptions from rational contract theory to examine how the employer and the agent respond to different forms of justice. However, this model consists of a specific case to derive some essential properties concerning the significance of harassment and the efficacy of various justice designs. These properties, presented in the subsequent sections, serve as a cautionary tale: harassment can be an ever-present incentive in labor contracts; this incentive can obscure contract risk; punitive, but not restorative, justice can be effective in reducing such issues. In general, the model introduces the theme of alternative forms of justice to the formal law and economics tradition.

2.2 A formal model on abusive bosses, verifiability and dissuasion

2.2.1 Moral Hazard under harassment

Inspired by LAFFONT e MARTIMORT [4], the model is based on a static moral hazard contract between a potentially abusive boss (principal) and a multitask female worker (agent). As in the traditional model, the boss is initially risk neutral and the agent is risk averse. For tractability, the model exhibited in this section assumes that the agent has square root utility - this is because it is the simplest function whose inverse also has a simple derivative.

To receive wage t , the worker can perform proper activities (a_p) at work, but may also be harassed to perform improper activities (a_i). Improper activities are non-contractible but fully observed by the boss. As a static contract model, the timing of game consists that improper activity happening first, and the moral hazard later.

Regarding proper effort $\psi(a_p)$, it can be high ($\psi(\bar{a}_p)$) and produce high quantity \bar{q} with probability π_1 , or low ($\psi(\underline{a}_p)$) and produce high quantity with probability π_0 (where $\pi_1 > \pi_0$). In addition, the effort function also includes improper activity ($\psi(a_p, a_i)$). Proper effort cannot be directly observed by the principal, only its result q . The agent's cost is multiplicative: the costs between proper and improper activities interact with each other, making them worse.

In this setting, we are concentrated in comparing two problematic measures involving

contracts under harassment: 1) the level of improper activity as a problem *per se* and 2) the contract risk borne by the agent.

The side by step solution is presented in Appendix A.

The problem

The utility of the boss is:

$$U_P = \pi_1 \cdot [q(\overline{a_p}) + a_i - \overline{t}] + (1 - \pi_1) \cdot [q(\underline{a_p}) + a_i - \underline{t}] \quad (2.1)$$

The utility of the female worker is:

$$U_A = \sqrt{t} - a_p \cdot a_i \quad (2.2)$$

For simplicity, a_p is not observable by the boss, but the result q is.

$$q = a_p + \theta \quad (2.3)$$

, where θ is a state of nature variable.

a_i is observable by the boss.

Hence, the principal problem is:

$$Max_{\overline{t}, \underline{t}, a_i} \pi_1 \cdot [\overline{q} + a_i - \overline{t}] + (1 - \pi_1) \cdot [\underline{q} + a_i - \underline{t}] \quad (2.4)$$

s.t.

$$\pi_1 [\sqrt{\overline{t}} - \overline{a_p} \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \overline{a_p} \cdot a_i] \geq \pi_0 [\sqrt{\overline{t}} - \underline{a_p} \cdot a_i] + (1 - \pi_0) [\sqrt{\underline{t}} - \underline{a_p} \cdot a_i] \quad (2.5)$$

$$\pi_1 [\sqrt{\overline{t}} - \overline{a_p} \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \overline{a_p} \cdot a_i] \geq U_r \quad (2.6)$$

Optimization - the value of improper activity a_i

The inequalities are expressed as equations because, as LAFFONT e MARTIMORT [4] explain, with risk neutrality, the principal can choose incentive-compatible transfers that

saturate the agent's participation constraint and leave no rent for the agent.

To determine the values of \bar{u} and \underline{u} , we fixed $\pi_1 = 0.5$ and the reserve utility U_r to zero for tractability, as these variables are exogenous.

We also set $\underline{a}_p = 0$ and $\bar{a}_p = 1$ to focus on the increase in effort in \bar{a}_p .

We consider the transfer function as an inverse utility function, with $h(u) = u^2 = t$.

With these simplifications, the principal's problem is:

$$Max_{\underline{u}, \bar{u}, a_i} 0.5[\bar{q} + a_i - \bar{u}^2] + 0.5[\underline{q} + a_i - \underline{u}^2] \quad (2.7)$$

s.t.

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = \pi_0 \bar{u} + (1 - \pi_0) \underline{u} \quad (2.8)$$

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = 0 \quad (2.9)$$

We isolate the values of \bar{u} and \underline{u} in the restrictions to insert in the Principal's function.

$$\bar{u} = a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \quad (2.10)$$

$$\underline{u} = a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \quad (2.11)$$

Now, we can insert 2.10 and 2.11 in 2.7 to make the optimization

$$Max_{a_i} 0.5[\bar{q} + a_i - (a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right])^2] + 0.5[\underline{q} + a_i - (a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right])^2] \quad (2.12)$$

The FOC is:

$$0.5[1 - 2(a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right]) * \left[1 + \frac{1}{(1 - 2\pi_0)} \right]] + 0.5[1 - 2(a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right]) * \left[1 - \frac{1}{(1 - 2\pi_0)} \right]] = 0 \quad (2.13)$$

The optimal level of improper activities by the model is:

$$a_i = \frac{1}{\left[1 + \frac{1}{(1-2\pi_0)}\right]^2 + \left[1 - \frac{1}{(1-2\pi_0)}\right]^2} \quad (2.14)$$

Assessing the Risk Measure under harassment

The risk measure is assessed by calculating $\bar{u} - \underline{u}$ in 2.10 and 2.11 and incorporating 2.14

$$\bar{u} - \underline{u} = 0 + a_i + a_i * \frac{1}{(1-2\pi_0)} - a_i + a_i * \frac{1}{(1-2\pi_0)} \quad (2.15)$$

$$\bar{u} - \underline{u} = a_i * \frac{2}{(1-2\pi_0)} \quad (2.16)$$

$$\bar{u} - \underline{u} = \frac{1}{\left[1 + \frac{1}{(1-2\pi_0)}\right]^2 + \left[1 - \frac{1}{(1-2\pi_0)}\right]^2} * \frac{2}{(1-2\pi_0)} \quad (2.17)$$

Based on this derivation, we can assess the conditions under which the problem of harassment arises. According to Theorem 2.2.1, this issue is always present in this particular setup.

Theorem 2.2.1. *The level of improper activities is no less than zero when there is a moral hazard problem.*

Proof. Equation 2.14 informs that, as $0 \geq \pi_0 > 0.5$, the denominator is always positive. Moreover, the closer π_0 is to 0.5, which is also the probability of the higher type, the lower the level of harassment. \square

As we perceive that harassment taints the contract at every level, even when the low effort and high effort agent are similar, we can also assess if the presence of harassment influences the level of contract risk. This is examined in Theorem 2.2.2.

Theorem 2.2.2. *The presence of improper activity masks risk in contract risk. It appears lower when compared to the case without harassment.*

Proof. Let's compare it with the basic model without harassment. (The step-by-step solutions are in Appendix A).

$$\text{Max}_{\underline{u}, \bar{u}} \pi_1 \cdot [\bar{q} - \bar{u}^2] + (1 - \pi_1) \cdot [\underline{q} - \underline{u}^2] \quad (2.18)$$

s.t.

$$\pi_1 [\bar{u} - \bar{a}_p] + (1 - \pi_1) [\underline{u} - \bar{a}_p] = \pi_0 [\bar{u} - \underline{a}_p] + (1 - \pi_0) [\underline{u} - \underline{a}_p] \quad (2.19)$$

$$\pi_1 [\bar{u} - \bar{a}_p] + (1 - \pi_1) [\underline{u} - \bar{a}_p] = 0 \quad (2.20)$$

In the subsequent models, we also fixed $\pi_1 = 0.5$ for tractability, and we consider $\underline{a}_p = 0$ and $\bar{a}_p = 1$.

By substituting 2.19 and 2.20, we have that $\underline{u} = 0$ and $\bar{u} = 0 + 2$, therefore, the risk measure is in our setup of the canonical moral hazard model:

$$\bar{u} - \underline{u} = 2 \quad (2.21)$$

Taking the limits in the equation 2.17, we find that when π_0 is zero, the contract risk measure is 1/2, and when π_0 is closer to 0.5, it approaches zero. This is always lower than the risk measure without harassment found in 2.21. \square

It is not possible to say that it actually mitigates the risk problem, but it may actually create an even bigger problem: the actual risk inherent in a labor contract is underestimated by the presence of improper activities that someone from outside would not be able to perceive.

Another way to compare the levels of improper activities and contract risk is by examining the extent of harassment under moral hazard in relation to the scenario where there is no information asymmetry. This analysis assesses whether the presence of this asymmetry alters the incentives the boss needs to provide in terms of improper activities to make the contract viable. This is elucidated in Theorem 2.2.3.

Theorem 2.2.3. *In the first best case with harassment, the level of improper activities is higher than the case of the second-best with moral hazard.*

Proof. Let's compare the first-best model with harassment. I derive the model with harassment and without information asymmetry and isolate the optimal level of improper activities for the boss, and see if it is higher than the case where there is harassment and also moral hazard. (The step-by-step solutions are in Appendix B).

In case of first best model with harassment, the principal problem is:

$$Max_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} + a_i - \bar{u}^2] + 0.5[\underline{q} + a_i - \underline{u}^2] \quad (2.22)$$

s.t.

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = 0 \quad (2.23)$$

We isolate the values of \underline{u} in the restriction to insert in the Principal's function.

Using (2.23):

$$\underline{u} = -\bar{u} + 2a_i \quad (2.24)$$

Now, the Principal's problem can be written as

$$Max_{\bar{u}, a_i} 0.5[\bar{q} + a_i - \bar{u}^2] + 0.5[\underline{q} + a_i - (-\bar{u} + 2a_i)^2] \quad (2.25)$$

The first FOC is:

$$-\bar{u} - 0.5 * 2 * (-\bar{u} + 2a_i) * -1 = 0 \quad (2.26)$$

$$\bar{u} = a_i \quad (2.27)$$

The second FOC is:

$$0.5 + 0.5 - 0.5 * 2 * (-\bar{u} + 2a_i) * 2 = 0 \quad (2.28)$$

$$1 + 2\bar{u} - 4a_i = 0 \quad (2.29)$$

Inserting (29) in (27):

$$1 + 2a_i - 4a_i = 0 \tag{2.30}$$

$$a_i = \frac{1}{2} \tag{2.31}$$

By comparing 2.14 and 2.31, the numerator looks the same. Since we know that $0 \geq \pi_0 > 0.5$, we know that when $\pi_0 = 0$, the level of improper activity is $1/4$, and when $\pi_0 \rightarrow 0.5$, harassment goes to zero. Therefore, the level of improper activities is lower in the presence of a moral hazard problem than in the first-best scenario. The intuition behind these results is that the principal needs to reduce harassment to provide incentives for the agent to make effort in proper activities under moral hazard. \square

2.3 Justice design against harassment

So far, we have found a sad story about harassment. In this moral hazard setting, the level of improper activities that the boss makes the worker do is higher than zero. In addition, improper activities mask the inherent risk within the contract; what may appear to be a reduced problem within the contract may actually be two significant problems: information asymmetry-related risk and improper activities. Is it possible to design a court that reduces these issues?

The topic of “access to justice” is a significant area of research within socio-legal studies, specifically in relation to ensuring institutional equality. The seminal work of CAPPELLETTI e GARTH [31] defines the legal system as the means by which people can vindicate their rights and resolve conflicts. The authors argue that access to justice refers to the legal system’s two purposes: to provide equal access to these means and to ensure that the outcome of this system is socially and individually just. The authors consider these to be the most basic human rights, as every person has the right to a modern legal system that aims to protect their rights, not just proclaim them.

Different legal traditions and political actors can influence the design of justice, leading to different approaches to addressing harassment. For example, in some countries, harassment may be treated as a matter of penal law and labor justice, while in others, it may be addressed through the courts using past jurisprudence on discrimination. The variability of justice designs can imply different level of effectiveness, popularity and politicization of these safeguard systems (See BIANQUINI [32], GILANI *et al.* [33], ZIPPEL [34]). By studying these cases, it is possible to understand how different forms of access to justice can impact the deterrence of harassment in labor contracts.

The level of justice in the model is assessed using the expression $(1 - \beta)$. This expression can represent the likelihood of a court convicting an abusive boss or the probability of a worker converting soft information into hard information to file a complaint. The design of justice varies based on where the expression $(1 - \beta)$ is included in the objective functions. The following propositions 2.3.1 and 2.3.2 describe how the incentives to harass change in the presence of punitive and restorative justice.

Theorem 2.3.1. *Punitive justice alters the level of improper activities and contract risk by comparing moral hazard settings with and without harassment and first-best and second-best with harassment.*

Proof. Punitive justice, in this model, is when only the benefit of the boss from improper activities is verified and punished without compensation to the victim. For instance, it is a case where sexual harassment is punished with fines collected by the state.

For this proof, I rewrite the moral hazard model with harassment with a term $(1 - \beta)$ along the improper activity term related just to the utility of the boss. Then, I observe if the measures of net harassment (after justice) and contract risk are lower than the case without justice.

When there is punitive justice, the utility of the boss is:

$$U_P = \pi_1.[q(\bar{a}_p) + (1 - \beta)a_i - \bar{t}] + (1 - \pi_1).[q(\underline{a}_p) + (1 - \beta)a_i - \underline{t}] \quad (2.32)$$

The utility of the female worker is:

$$U_A = \sqrt{t} - a_p.a_i \quad (2.33)$$

For simplicity, a_p is not observable by the boss, but the result q is.

$$q = a_p + \theta \quad (2.34)$$

, where θ is a state of nature variable.

a_i is observable by the boss, but the court of justice only observe a_i in the boss' utility function.

Considering the simplifications done in the other models, the principal problem is:

$$Max_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} + (1 - \beta)a_i - \bar{u}^2] + 0.5[\underline{q} + (1 - \beta)a_i - \underline{u}^2] \quad (2.35)$$

s.t.

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = \pi_0\bar{u} + (1 - \pi_0)\underline{u} \quad (2.36)$$

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = 0 \quad (2.37)$$

We isolate the values of \bar{u} and \underline{u} in the restrictions to insert in the Principal's function.

$$\bar{u} = a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \quad (2.38)$$

$$\underline{u} = a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \quad (2.39)$$

Now, we can insert 2.38 and 2.39 in 2.35 to make the optimization

$$Max_{a_i} 0.5[\bar{q} + (1 - \beta)a_i - (a_i[1 + \frac{1}{(1 - 2\pi_0)}])^2] + 0.5[\underline{q} + (1 - \beta)a_i - (a_i[1 - \frac{1}{(1 - 2\pi_0)}])^2] \quad (2.40)$$

The FOC is:

$$0.5[(1 - \beta) - 2(a_i[1 + \frac{1}{(1 - 2\pi_0)}]) * [1 + \frac{1}{(1 - 2\pi_0)}]] + 0.5[(1 - \beta) - 2(a_i[1 - \frac{1}{(1 - 2\pi_0)}]) * [1 - \frac{1}{(1 - 2\pi_0)}]] = 0 \quad (2.41)$$

The level of optimal improper activities is:

$$a_i = \frac{1 - \beta}{[1 + \frac{1}{(1 - 2\pi_0)}]^2 + [1 - \frac{1}{(1 - 2\pi_0)}]^2} \quad (2.42)$$

The risk measure is assessed by calculating $\bar{u} - \underline{u}$ in 2.38 and 2.39 and incorporating 2.42:

$$\bar{u} - \underline{u} = 0 + a_i + a_i * \frac{1}{(1 - 2\pi_0)} - a_i + a_i * \frac{1}{(1 - 2\pi_0)} \quad (2.43)$$

$$\bar{u} - \underline{u} = a_i * \frac{2}{(1 - 2\pi_0)} \quad (2.44)$$

$$\bar{u} - \underline{u} = \frac{1 - \beta}{\left[1 + \frac{1}{(1-2\pi_0)}\right]^2 + \left[1 - \frac{1}{(1-2\pi_0)}\right]^2} * \frac{2}{(1 - 2\pi_0)} \quad (2.45)$$

To compare 2.42 and 2.14, we found that the presence of punitive justice reduces the level of improper activities. By comparing 2.45 and 2.17, we also found that punitive justice reduces contract risk. When the level of court verifiability is at its maximum ($\beta = 1$), the measures go to zero and resemble the first-best case without harassment. \square

Theorem 2.3.2. *Restorative justice does not alter the level of improper activities and contract risk when compared with moral hazard with harassment.*

Proof. To define restorative justice in this model, I focus on a crucial feature of this justice design: the concern for to reduce the damages against the victim. Here, it refers to a case where both the boss' benefit and the agent's cost from improper activities are verified and punished, with compensation provided to the victim. In a very simple setting, it is a scenario in which sexual harassment is punished with indemnity.

For this proof, I rewrote the moral hazard model with harassment to include a term $(1 - \beta)$ along the improper activity term related to both the boss' utility and the agent's utility. I then examined whether the measures of harassment and contract risk are lower in this case compared to the case without justice.

By this definition, the utility of the boss is:

$$U_P = \pi_1 \cdot [q(\bar{a}_p) + (1 - \beta)a_i - \bar{t}] + (1 - \pi_1) \cdot [q(\underline{a}_p) + (1 - \beta)a_i - \underline{t}] \quad (2.46)$$

And the utility of the female worker is:

$$U_A = \sqrt{t} - a_p \cdot (1 - \beta)a_i \quad (2.47)$$

For simplicity, a_p is not observable by the boss, but the result q is.

$$q = a_p + \theta \quad (2.48)$$

, where θ is a state of nature variable.

a_i is fully observable by the boss and the court of justice.

Considering the simplifications done in the other models, the principal problem is:

$$Max_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} + (1 - \beta)a_i - \bar{u}^2] + 0.5[\underline{q} + (1 - \beta)a_i - \underline{u}^2] \quad (2.49)$$

s.t.

$$0.5[\bar{u} - (1 - \beta)a_i] + 0.5[\underline{u} - (1 - \beta)a_i] = \pi_0\bar{u} + (1 - \pi_0)\underline{u} \quad (2.50)$$

$$0.5[\bar{u} - (1 - \beta)a_i] + 0.5[\underline{u} - (1 - \beta)a_i] = 0 \quad (2.51)$$

We isolate the values of \bar{u} and \underline{u} in the restrictions to insert in the Principal's function.

$$\bar{u} = (1 - \beta)a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \quad (2.52)$$

$$\underline{u} = (1 - \beta)a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \quad (2.53)$$

Now, we can insert 2.52 and 2.53 in 2.49 to make the optimization

$$Max_{a_i} 0.5[\bar{q} + (1 - \beta)a_i - ((1 - \beta)a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right])^2] + 0.5[\underline{q} + (1 - \beta)a_i - ((1 - \beta)a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right])^2] \quad (2.54)$$

The FOC is:

$$0.5[(1 - \beta) - ((1 - \beta)a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right]) * (1 - \beta) \left[1 + \frac{1}{(1 - 2\pi_0)} \right]] + 0.5[(1 - \beta) + (1 - \beta)a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right]) * (1 - \beta) \left[1 - \frac{1}{(1 - 2\pi_0)} \right]] = 0 \quad (2.55)$$

$$a_i = \frac{1}{(1 - \beta)} \frac{1}{\left[1 + \frac{1}{(1 - 2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1 - 2\pi_0)} \right]^2} \quad (2.56)$$

A relevant exercise in analyzing restorative justice is to assess the net level of improper activities after compensations. The exercise consists by simply obtaining $(1 - \beta)a_i$:

$$(1 - \beta)a_i = \frac{1}{\left[1 + \frac{1}{(1-2\pi_0)}\right]^2 + \left[1 - \frac{1}{(1-2\pi_0)}\right]^2} \quad (2.57)$$

The risk measure is assessed by calculating $\bar{u} - \underline{u}$ in 2.53 and 2.52 and incorporating 2.56

$$\bar{u} - \underline{u} = \frac{1}{\left[1 + \frac{1}{(1-2\pi_0)}\right]^2 + \left[1 - \frac{1}{(1-2\pi_0)}\right]^2} * \frac{2}{(1 - 2\pi_0)} \quad (2.58)$$

When we compare 2.57 and 2.14, 2.58 and 2.17, we have the same levels of improper activities and risk. \square

By comparing theorem 2.3.1 and 2.3.2, we have our corollary:

Corollary 2.3.2.1. *Punitive justice performs better than restorative justice in reducing harassment and contract risk.*

The intuition behind this unexpected result is that the compensation by the agent alleviates the costs considered in the Principal's objective function, leaving null effects to his incentives.

2.4 Robustness tests and Comparative Tables

As a matter of robustness, we also solve the model in the case where the principal is risk averse with relation to his gain with improper activities and punishment.

Theorem 2.4.1. *The Propositions 2.2.1, 2.2.2, 2.2.3, 2.3.1 and 2.3.2 are valid even when the principal is risk averse with relation to his gain with improper activities and punishment.*

The long exercise is shown from Appendix A.8 to A.13. In the models presented in the last theorems, term of boss' benefit on improper activities is modified. Instead of a_i in the boss' objective function, the payoff of harassment is a generalized concave function $g(a_i)$ (that $g'(a_i) > 0$ and $g''(a_i) < 0$). The model is solved as a implicit function, a_i a function of $g'(a_i)$.

Tables 2.1 to 2.6 present the comparative measures of contract welfare considering the presence or not of harassment at work. It is possible to see that the model for a_i is almost analogous to the case of fully risk-neutral principal, even when there is access to any type of justice modelled. Moreover, the level of improper activities and risk can be higher in the risk averse principal case when $g'(a_i) > 1$ and lower when $g'(a_i) < 1$.

Table 2.1: Comparative measures between models under harassment and without harassment - level of improper activities (a_i)

	Canonical MH (without harassment)	-
	FB with harassment	$\frac{1}{2}$
	FB with harassment and punitive justice	$\frac{1-\beta}{2}$
Risk Neutral Principal	FB with harassment and restorative justice	$\frac{1}{2(1-\beta)}$
	MH with harassment	$\frac{1}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	MH with harassment and punitive justice	$\frac{1-\beta}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	MH with harassment and restorative justice	$\frac{1}{(1-\beta)[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	FB with harassment	$\frac{g'(a_i)}{2}$
Risk Averse Principal	FB with harassment and punitive justice	$\frac{(1-\beta)g'(a_i)}{2}$
	FB with harassment and restorative justice	$\frac{g'(a_i)}{2(1-\beta)}$
	MH with harassment	$\frac{g'(a_i)}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	MH with harassment and punitive justice	$\frac{(1-\beta)g'(a_i)}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	MH with harassment and restorative justice	$\frac{1}{(1-\beta)} \frac{g'(a_i)}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$

Obs: FB = First Best contract; MH = Moral Hazard Contract. Punitive justice = verifiability on the principal, restorative justice = verifiability on the principal and agent. The agent is risk averse (square root utility) in all models.

Table 2.2: Comparative measures between models under harassment and without harassment - variation of improper activities wrt justice ($\frac{\partial a_i}{\partial \beta}$)

Risk Neutral Principal	Canonical MH (without harassment)	-
	FB with harassment	-
	FB with harassment and punitive justice	$-\frac{1}{2}$
	FB with harassment and restorative justice	$\frac{1}{2(1-\beta)^2}$
	MH with harassment	-
	MH with harassment and punitive justice	$\frac{-1}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	MH with harassment and restorative justice	$\frac{1}{(1-\beta)^2 [1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	FB with harassment	-
Risk Averse Principal	FB with harassment and punitive justice	$-\frac{-g'(a_i)}{1-\frac{2}{(1-\beta)g''(a_i)}}$
	FB with harassment and restorative justice	$\frac{\frac{g'(a_i)}{2(1-\beta)^2}}{1-\frac{g''(a_i)}{2(1-\beta)}}$
	MH with harassment	-
	MH with harassment and punitive justice	$1-\frac{\frac{g'(a_i)}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}}{(1-\beta)*g''(a_i)}$
	MH with harassment and restorative justice	$1-\frac{\frac{1}{(1-\beta)^2} \frac{g'(a_i)}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}}{1-\frac{1}{(1-\beta)} \frac{g''(a_i)}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}}$

Obs: FB = First Best contract; MH = Moral Hazard Contract. Punitive justice = verifiability on the principal, restorative justice = verifiability on the principal and agent. The agent is risk averse (square root utility) in all models.

Table 2.3: Table 3: Comparative measures between models under harassment and without harassment - risk ($\bar{u} - u$)

Risk Neutral Principal	Canonical MH (without harassment)	2
	FB with harassment	-
	FB with harassment and punitive justice	-
	FB with harassment and restorative justice	-
	MH with harassment	$\frac{1}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} * \frac{2}{(1-2\pi_0)}$
	MH with harassment and punitive justice	$\frac{1-\beta}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} * \frac{2}{(1-2\pi_0)}$
	MH with harassment and restorative justice	$\frac{1}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} * \frac{2}{(1-2\pi_0)}$
Risk Averse Principal	FB with harassment	-
	FB with harassment and punitive justice	-
	FB with harassment and restorative justice	-
	MH with harassment	$\frac{g'(a_i)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} * \frac{2}{(1-2\pi_0)}$
	MH with harassment and punitive justice	$\frac{(1-\beta)g'(a_i)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} * \frac{2}{(1-2\pi_0)}$
MH with harassment and restorative justice	$\frac{g'(a_i)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} * \frac{2}{(1-2\pi_0)}$	

Obs: FB = First Best contract; MH = Moral Hazard Contract. Punitive justice = verifiability on the principal, restorative justice = verifiability on the principal and agent. The agent is risk averse (square root utility) in all models.

Table 2.4: Comparative measures between models under harassment and without harassment - variation of risk wrt justice ($\frac{\partial \bar{u} - u}{\partial \beta}$)

Risk Neutral Principal	Canonical MH (without harassment)	-
	FB with harassment	-
	FB with harassment and punitive justice	-
	FB with harassment and restorative justice	-
	MH with harassment	-
	MH with harassment and punitive justice	$\frac{-1}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} * \frac{2}{(1-2\pi_0)}$
	MH with harassment and restorative justice	0
Risk Averse Principal	FB with harassment	-
	FB with harassment and punitive justice	-
	FB with harassment and restorative justice	-
	MH with harassment	-
	MH with harassment and punitive justice	$\frac{-g'(a_i)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} * \frac{2}{(1-2\pi_0)}$
	MH with harassment and restorative justice	0

Obs: FB = First Best contract; MH = Moral Hazard Contract. Punitive justice = verifiability on the principal, restorative justice = verifiability on the principal and agent. The agent is risk averse (square root utility) in all models.

Table 2.5: Comparative measures between models under harassment and without harassment - net improper activity after verification $((1 - \beta)a_i)$

	Canonical (without harassment)	-
	FB with harassment	-
	FB with harassment and punitive justice	$\frac{(1-\beta)(1-\beta)}{2}$
Risk Neutral Principal	FB with harassment and restorative justice	$\frac{1}{2}$
	MH with harassment	-
	MH with harassment and punitive justice	$\frac{(1-\beta)(1-\beta)}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	MH with harassment and restorative justice	$\frac{1}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	FB with harassment	-
	FB with harassment and punitive justice	$\frac{(1-\beta)^2 g'(a_i)}{2}$
Risk Averse Principal	FB with harassment and restorative justice	$\frac{g'(a_i)}{2}$
	MH with harassment	-
	MH with harassment and punitive justice	$\frac{(1-\beta)^2 g'(a_i)}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	MH with harassment and restorative justice	$\frac{g'(a_i)}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$

Obs: FB = First Best contract; MH = Moral Hazard Contract. The agent is risk averse (square root utility) in all models.

Table 2.6: Comparative measures between models under harassment and without harassment - variation of net improper activity wrt justice $(\frac{\partial(1-\beta)a_i}{\partial\beta})$

	Canonical (without harassment)	-
	FB with harassment	-
	FB with harassment and punitive justice	$\frac{-2(1-\beta)}{2}$
Risk Neutral Principal	FB with harassment and restorative justice	0
	MH with harassment	-
	MH with harassment and punitive justice	$\frac{-2(1-\beta)}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	MH with harassment and restorative justice	0
	FB with harassment	-
	FB with harassment and punitive justice	$\frac{-2(1-\beta)g'(a_i)}{2}$
Risk Averse Principal	FB with harassment and restorative justice	0
	MH with harassment	-
	MH with harassment and punitive justice	$\frac{-2(1-\beta)g'(a_i)}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}$
	MH with harassment and restorative justice	0

Obs: FB = First Best contract; MH = Moral Hazard Contract. The agent is risk averse (square root utility) in all models.

2.5 Optimal Justice?

Is it possible to estimate an optimal level of justice? The idea of what courts should maximize dates back to early criticisms of the Law and Economics School in the 1970s and 80s. In his seminal work, POSNER [5] formulated the criteria of wealth maximization: courts should increase efficiency in markets in a way that maximizes the monetary estimates of everything in society, which can be explicit or implicitly monetized. This idea would be valid not only in civil, commercial, and labor law, but also in criminal law, where courts deter inappropriate behavior that disrupts voluntary exchange. Posner argues that the criteria of efficiency for wealth maximization would avoid some pitfalls that are common among economists' utilitarianism, such as the difficulty of aggregation and comparison between utilities of different people. Posner's theory faced notable criticism. The most common objection is that wealth itself is a value and has little meaning without people giving normative importance between things; thus, it would not escape the pitfalls of utilitarianism [35–37]. Additionally, a deontological criteria of court action is also present: for instance, CALABRESI [38] defines justice as a veto power for efficiency maximization schemes. DWORKIN [35, 36] deny an implicit trade-off between efficiency and justice and affirm equality as a deontological value that defines the distribution of wealth¹.

Inspired by this discussion, in our setting, the justice system can consider two possible trade-offs. The first one is to minimize a loss function of two negative (inefficient) indicators that can plague labor contracts under harassment: the harassment itself and the contract risk. The second trade-off is the (utilitarian) social welfare within the contract: the judicial system can choose the best level of prosecution that maximizes the aggregate between the boss's and the worker's utility. As one may give special emphasis to the issue of harassment and the welfare of the worker for fairness purposes, it is reasonable to also give a weight λ to these measures.

2.5.1 Loss function of bad contract indicators

With punitive justice

The loss function considering harassment and contract risk under punitive justice is:

$$L = -\frac{1 - \beta}{\left[1 + \frac{1}{(1-2\pi_0)}\right]^2 + \left[1 - \frac{1}{(1-2\pi_0)}\right]^2} * \frac{2}{(1 - 2\pi_0)} - \lambda * \left[\frac{1 - \beta}{\left[1 + \frac{1}{(1-2\pi_0)}\right]^2 + \left[1 - \frac{1}{(1-2\pi_0)}\right]^2}\right] \quad (2.59)$$

The optimal level of justice in this case is a corner solution:

¹Further discussion can be found in [39, 39–42], [43]. For a contemporary review of this debate, see [44]

$$\frac{\partial L}{\partial \beta} = \frac{1}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} * \frac{2}{(1-2\pi_0)} + \lambda * [\frac{1}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2}] \neq 0 \quad (2.60)$$

As the contract risk also consider harassment level, the model suggests that there is not actually a trade-off between harassment and risk - they are complementary. In this setting, the best justice is to offer full persecution against harassment to reduce contract problems.

With restorative justice

The loss function considering (net) harassment and contract risk under restorative justice is:

$$L = \frac{1}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} * \frac{2}{(1-2\pi_0)} + \lambda * [\frac{1}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2}] \quad (2.61)$$

The optimal level of justice is not obtainable. As the harassment level is the same with or without restorative justice, any level of justice leads to the same results.

$$\frac{\partial L}{\partial \beta} = 0 \quad (2.62)$$

2.5.2 Social Welfare

With punitive justice

The social welfare related to the contract considering punitive justice is:

$$S = 0.5[\bar{q} + (1 - \beta)a_i - (a_i[1 + \frac{1}{(1-2\pi_0)}])]^2 + 0.5[\underline{q} + (1 - \beta)a_i - (a_i[1 - \frac{1}{(1-2\pi_0)}])]^2 + \lambda(0.5[(a_i[1 + \frac{1}{(1-2\pi_0)}]) - a_i] + 0.5[(a_i[1 - \frac{1}{(1-2\pi_0)}]) - a_i]) \quad (2.63)$$

$$\beta = 1 \quad (2.64)$$

If the court uses punitive justice, the optimal level of justice for social welfare is the maximum. Appendix N presents the full derivation of this subsection.

With restorative justice

The social welfare related to the contract considering restorative justice is:

$$\begin{aligned}
S = & 0.5[\bar{q} - (\frac{1}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}[1 + \frac{1}{(1-2\pi_0)}])]^2 + \\
& 0.5[\bar{q} - (\frac{1}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2}[1 - \frac{1}{(1-2\pi_0)}])]^2 + \frac{1}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2} + \quad (2.65) \\
& \lambda(0.5\bar{u} + 0.5\underline{u} - \frac{1}{[1+\frac{1}{(1-2\pi_0)}]^2+[1-\frac{1}{(1-2\pi_0)}]^2})
\end{aligned}$$

Any level of justice leads to the same level of social welfare. The reason is the same: as the harassment level is the same with or without restorative justice, any level of justice leads to the same results.

$$\frac{\partial L}{\partial \beta} = 0 \quad (2.66)$$

To summarize, improper actions and contract risks in our setting act as complements, and the absence of trade-off results in the optimal justice being the highest possible when it comes to punitive justice. This way, punitive justice can achieve both efficiency and justice as prescribed by authors such as DWORKIN [35, 36].

2.6 Conclusion

In this article, I investigated the impacts of harassment in moral hazard settings and how different access to justice measures can modify these problems. The concept of harassment used here involves non-contractible but observable improper activities by the boss. It is argued that better access to justice improves the verifiability of contracts, which can modify welfare indicators. In this first approach, the results suggest that in a moral hazard setting, improper activities in a labor contract mask the risk measures. However, a court of justice can only reduce harassment when its task is to punish the principal.

The findings presented a cautionary tale that indicates that the presence of an effective justice system may be a pertinent approach for enhancing labor market efficiency and advancing gender equality. However, the design of justice may be important in achieving these goals. The moral hazard settings presented in this paper did not explain how restorative justice can be a superior justice design.

It remains to be seen if these results are generalizable for any concave agent utility function. Moreover, further research can identify if there are formal contract arrangements where restorative justice can improve welfare. It would also be useful to research the development of a dynamic model to generalize the model concerning the timing of harassment, the rehabilitation of the offender, and to understand the interactions between criminal and labor courts.

Chapter 3

Collective memory and means of claims in democracies: Evidence from Chile (2019-2023)

The persistence of political behavior after historical-political tragedies is a debated topic, despite it is unclear whether people retain the motivations behind their transmitted values. This article argues that protests are crucial for politically engaging countries with a strong memory of past violence. It examines Chile's "Estallido Social" protests triggered by police violence from October 2019 to March 2020, followed by the Constituent Plebiscite between 2020 and 2023. Chile has a history of institutional violence, especially during Pinochet's authoritarian rule. LS analysis shows that municipalities with military bases before 1970 had increased participation in the "Estallido Social" protests. However, these same municipalities had lower participation in the Constitutional voting process, without endorsing any specific party coalition. 2SLS estimation reveals that political victimization during the Pinochet era and contemporary remembrance of the 1973 coup on social media significantly explain this effect. In conclusion, political violence can stimulate participation beyond voting but may weaken the connection between voters and political elites.

3.1 Introduction

Does collective memory in democracies influence whether people make demands in the streets or through the voting booth?

Universal suffrage mechanisms are a key feature of democratic societies. Elections are a means for politicians to be held accountable to the people. Since the seminal work of Meltzer and Richard [45], literature on the economics of democracy has emphasized the incentives that elections give politicians to redistribute income to the poor. For example,

making voting technologies more accessible can make politicians more likely to invest in public healthcare [46]. However, freedom of association, speech, and other individual rights are also important for accountability, as they allow people to denounce irregularities and hold public officials accountable to social demands [47].

Protest can also be a powerful way to assert civil, political, and economic rights. Traditional literature on the economics and politics of social unrest suggests that the fear of revolutions motivates elites to grant these rights to the people [48]. However, the incentives for political leaders are stronger when a significant proportion of moderate activists join the protests [49]. The emotions expressed in protests can have electoral repercussions, but politicians' responses also depend on the noisiness of social demands [50].

To summarize, elections are a way for politicians to be held accountable to the people. However, the recognition of civil, political, and economic rights can also be influenced by an engaged society outside of elections. The use of freedom of association and speech can allow collective social organizations to form, leading to diagonal accountability. Therefore, we have two types of accountability with different languages from the people to the government [51]. Part of literature often describes the two mechanisms as complementary since people can protest when they are dissatisfied with the electoral options [52–54].

Collective memory can be a significant variable in explaining political engagement, combining political emotions and institutional persistence theories. A general sentiment of unfair treatment by governments [55] and the relative deprivation of not achieving expected social goals [56] can lead to social unrest. However, these emotions can be sparked by current policies and can interact with the persistence of past institutional features. Past historical events can have an impact on present social practices. For example, previous instances of racial violence can diminish contemporary electoral engagement [57] and foster increased social mistrust [58]. Similar findings have been observed regarding the level of surveillance and repression during past authoritarian regimes [59, 60]. Other effects of past political repression is persistent higher levels of voting on the opposition left [61]. However, the literature on the persistence of political behavior often lacks clear evidence regarding whether the people as a whole remember the underlying reasons behind the values they pass on ¹. Collective memory is a sociological concept introduced by Maurice Halbwachs. It refers to the body of information and values shared by a social group about events that are remembered by their members. Unlike personal memory that fades away when the individuals who experienced it die, in historical-collective memory, these past events are remembered directly by those who lived through them or indirectly through documents, oral traditions, and ceremonies. In this case, collective memory becomes a social institution that is passed down through generations [64]

¹NIKOLOVA *et al.* [59] and BAUTISTA [62, 63] found suggestive mechanism of personal memory within the victim's family.

Even if institutional reforms take place to have regime change, some institutions can remain embedded in exclusionary culture or policy [65], leading to social dissatisfaction. Focused political collective memories can also create ambiguous attitudes towards democracy. On the one hand, elites can manipulate them (in a supply-side approach) to maintain their power [66, 67]; on the other hand, memories can also fuel demands against elites outside of democracy [68]. In democratic contexts, [69] argues that protests can lead to social experimentation within the democratic process, contributing to institutional robustness.

In this paper, we examine the impact of historical state violence on present-day political engagement. Chile is a suitable case to test these impacts (as discussed in Section 2), as it has experienced extreme political repression in the past and recent social unrest: between 1973 and 1989, the country was ruled by a violent military regime that victimized over 40,000 people; it underwent a process of democratization in 1988, but retained some institutional features from the dictatorship, such as the police organization and the core of the 1980 Constitution; and its people have participated in one of the largest waves of protests in the Global South according to the Carnegie Endowment for International Peace [70], which pressured the right-wing president Sebastian Piñera and the Chilean national congress to initiate a new constituent process.

After a thorough process of theory-building and causal tracing analysis [71], we formulated hypotheses about how presence of repression centers of Pinochet's regime could influence different forms of political engagement: protests or voting. We tested these hypotheses using cross-section regressions from 328 municipalities ("comunas"), with the number of demonstrations, participation, and voting in the Constituent Plebiscite as dependent variables, and the presence of military bases before 1970 as the primary independent variable. The regressions were estimated using least squares, both weighted by population. To address the issue of historical repression and political engagement being influenced by the same older electoral safe-seats, we followed BAUTISTA *et al.* [72] in using the placement of military bases before 1970 as an exogenous variable of political repression during the Pinochet Era (see the discussion in Section 3.3). To assess the persistence of memory into contemporary political behavior, we propose a mechanism analysis based on data on social media of users remembering the violence of 1973 coup.

The estimates show that areas with repression centers had more protests but lower participation in the Constituent Plebiscite thirty years after. No results were found for how the population voted. 2SLS estimates suggest that the rate of political victimization and contemporary remembrance in social media are relevant mechanisms behind this effect. Based on the hypotheses developed in the case study, the results suggest that the memory of past institutional violence leads to political mobilization through protests, especially in response to present repression. However, little can be said about engagement in the voting system. To provide complementary evidence on autobiographical memory, surveys of

survivors could be used (see BAUTISTA [62])

In the next section, we present the Chilean case study that underlies our analysis.

3.2 Case Study

3.2.1 Antecedents: the Pinochet regime repression

In 1973, General Augusto Pinochet overthrew the civil government of Salvador Allende. The Allende government, a coalition of left-wing parties (Unidad Popular), won the elections in 1969 and had a plan to implement Marxian socialism. The implementation of strong price Controls and redistributive policies led to economic instability and political polarization [73]. Once Pinochet took power, the military junta engaged in an anti-communist witch hunt against former politicians in the Allende government, trade unions, and the opposition in general. In the first months, the majority of repression was carried out by the armed forces and police officers (Carabineros) and, along other places, the old military bases created in democratic era for national security were used as repression centers [72]. In 1974, repression was centralized under a single agency (Dirección de Inteligencia Nacional - DINA). Under external pressure due to human rights violations, DINA was replaced by another agency, supposedly “more supervised,” in 1977 (Central Nacional de Informaciones - CNI) [74]. According to official records, 3,216 people were killed or forcibly disappeared and 38,254 people were imprisoned for political reasons during the dictatorship period, and 94% of these prisoners were tortured [72].

Pinochet and the military concentrated political power, establishing a new constitution in 1980. This constitution extended Pinochet’s mandate and privatized the public pension system in Chile, minimized government intervention in the economy, and biased the electoral system towards right-wing parties [72]. The repression also led to civil resistance, which was a concern for the junta [75]. Along with economic crises in the 1980s, social organizations organized strikes and protests calling for democratization, which was also supported by international pressure. In 1988, a plebiscite on the continuation of Pinochet’s government took place. The “No” vote won with 55% of the votes, and the “Concertación” coalition for the “No” won the elections in the following mandate and the subsequent elections until 2005 [72].

The Chilean democratization process was seen as incomplete. Pinochet remained the head of the armed forces until 1998 and had a lifetime seat in Congress until 2002, the year he resigned due to corruption and human rights charges [72]. STERN [76] argue that after the redemocratization, Chilean society faced tensions of memories of the victims by organized social groups which collided with initiatives of forgetting by Pinochetistas. Despite several constitutional reforms to improve the electoral system, the core of the 1980 constitution remained, leading to debates about its undemocratic nature [77].

3.2.2 Estallido Social and the Chilean Constituent

The trigger for the social unrest in Chile from 2019 to 2020 was the adjustment of transport fares in Santiago. On October 1, 2019, the Public Transport Expert Panel increased the bus fare by 10 pesos and the peak and off-peak metro fare by 30 pesos. The new fares were to be enforced on October 6 [78].

The first organized protests took place on October 7. High school students in downtown Santiago jumped the turnstiles in metro stations en masse for several days [79]. A week later, the first “violent” act occurred when a student was arrested after breaking a glass door at Pedro de Valdivia Station [80].

A large protest at several Metro stations had been organized on social media for October 18 [81]. However, October 16 was a turning point in terms of participation. According to Google Trends, searches for the term “18 de Octubre” reached their peak in Chile following the first clash with the Carabineros [82]. This clash occurred at the Santa Ana station and resulted in the arrest of four more students [83]. The Metro suspended services at several stations on Line 5. In the afternoon, another group of students broke down the gate at Plaza de Armas station [84]. On October 17, tensions further escalated with the looting of San Joaquin station [85] and the arrest of 133 students [86].

On October 18th, #ChileDespertó (Chile woke up). The protests gained even larger scale, and protesters fully occupied downtown Santiago - this event was also known as the “Santiagazo.” The electricity company Enel’s headquarters was damaged by fire - the electricity fare was also a complaint, but the accusation of arson was not yet solved [87]. Large-scale clashes with the Carabineros also occurred: protesters were subjected to water jets and tear gas in many parts of the city. At night, residents of Santiago organized a massive “cacerolazo” (pot-banging protest) in their homes in support of the demonstrations in the streets [88]. In response to the protests, the Minister of Defense Andrés Chadwick declared in a press conference that they would use the National Security Act against the “violentists.” Furthermore, the Metro company president announced that the Metro would remain closed for one week, with no mention of reversing the fare adjustments [89]. At the end of the night, the President of Chile Sebastián Piñera was seen at a luxury restaurant, which sparked criticism in public opinion [90].

In the first minutes after midnight, President Piñera declared a state of emergency in Santiago and nearby cities, and authorized the armed forces to maintain order. The armed forces chief imposed curfews in the designated state of emergency area. Despite these efforts, the protests persisted in Santiago and quickly spread to other regions of the country - for example, protesters set up barricades in the streets, and the police barracks were attacked in Concepción [91]. Piñera extended the state of emergency to almost all regional capitals in Chile. The declaration of a state of emergency and the use of curfews outside of natural disasters were the first of their kind since the end of Pinochet’s regime [92]. Se-

bastián Piñera stated that the country was “at war with a powerful and implacable enemy,” which fueled further revolt [93]. However, he also proposed suspending the readjustment and convening a meeting with leaders of different powers to discuss solutions to the high cost of living and the “safety of the family” [94].

On October 20th, President Piñera held a meeting with the President of the Deputies Chamber Iván Flores, the President of the Supreme Court Haroldo Brito, and the President of the Senate Jaime Quintana. At this meeting, Quintana proposed resuming the process of writing a new constitution [95]. On the same day, an extraordinary session of parliament suspended the Metro fare readjustment [96]. Meanwhile, protests intensified, with peaceful protesters supporting students - they claimed “it was not for the 30 pesos (of the readjustment) but 30 years (of democracy)” [97]. However, there were also instances of arson, looting, and violent clashes, with police using shots, tear gas, and water jets, and the first deaths were recorded. During this period, the formation of “cabildos abiertos,” or open and decentralized assemblies self-composed to discuss social issues and solutions, was also observed. Examples of themes discussed in these assemblies included the new constitution, drug legalization, and local networks for service provision [98]. Finally, on October 21st, social leaders organized themselves to formally advocate for a new constitution [99].

On October 22nd, President Piñera presented a package of reforms called “New Social Agenda,” which included: a 20% increase in pensions, the creation of public insurance for medication and serious illnesses, a mechanism to stabilize electricity fares, an increase in taxes for high incomes, a reduction in the wages of high-ranking public workers, and limits on re-elections and the number of congressmen [100]. However, these measures were seen as too modest, even among Piñera’s allies [101].

Three days later, “La Marcha Más Grande De Todas” (the greatest march of all) took place [102], with an estimated 1,000,000-1,500,000 people in Santiago, 50,000 in Concepción, and a similar number in Valparaíso. On October 27th, 100,000 people peacefully marched between Viña Del Mar and Valparaíso, but faced police repression [103]. Both protests also called for the impeachment of President Piñera and against private pensions, high costs of living, and a lack of public services. Under pressure, Sebastián Piñera declared the end of the state of emergency and the presence of armed forces on the streets [104]. Piñera also invited his ministers to resign, which was accepted by eight ministers, including the minister of public security [105]

Even after the end of the state of emergency, protests continued in smaller numbers, often led by organized social groups. On November 4th, trade unions called for a general strike for a new constitution - on this day, 20,000 people participated, and the protest was marked by some of the most violent incidents of the period [106]. On the following day, the protests reached the eastern part of Santiago, the country’s financial center. The headquarters of the right-wing party Unión Democristiana Independiente and the memorial

of Jaime Guzmán, mentor of Pinochet's 1980 constitution, were vandalized [107]. Due to allegations of human rights violations, the Ministry of Public Security announced on November 9th that the government would reform the police [108].

On November 7th, the Chilean Municipality Association approved a call for a citizen consultation on a new constitution [109]. On November 12th, President Piñera announced three National Agreements in response to the protests: for peace, as he called on retired military personnel to reintegrate the security forces; for justice, as he reiterated the Social Agenda; and for a new constitution [110].

On November 15th, an agreement was reached between the government and the opposition to hold a constitutional plebiscite. A project for a constitutional amendment was presented and approved on December 16th in the Deputies Chamber [111] and on December 19th in the Senate [112]. The amendment was then promulgated on December 24th [113]. The amendment stipulated that the people must choose in the plebiscite whether or not to approve a constituent process, and if the constituent would be a mixed convention between newly elected constituents and current elected congress members, or a fully popular convention. In addition, the plebiscite must ensure gender equality and a minimum percentage of indigenous representation in the composition of the convention.

The plebiscite was scheduled for March 24th, 2020, but was postponed to October 25th, 2020 due to the COVID-19 pandemic. According to the Chilean electoral service (<https://www.servel.cl>), more than 7.5 million people participated in the plebiscite on that day - an all time record. The option to "approve" the constituent process won with 78.2% of the votes, and the choice of a fully popular convention won with 79.1%

Along with 2020, there were a few protests. Student protests took place on January 6-7th against the national university admission exam [114]; demonstrations against the death of a football fan who was run over by a police truck on January 28th [115]; and protests against the International Festival of Music in Viña del Mar in February [116]. On March 18th, a state of emergency was declared due to the COVID-19 pandemic. Protests lost momentum, with the exception of October 18th, 2020, when the march on the first anniversary of the "estallido" was marked by around 30,000 people protesting in Santiago's main square, clashes with the police, 580 arrests, and two churches burned down [117]. The "estallido" resulted in more than 3,700,000 people participating in protests until November 10th 2019 [118], 34 deaths confirmed, 12,500 people hospitalized, and reports of 5,558 victims of institutional violence until October 2020 [119].

According to the electoral service (<https://www.servel.cl>), almost 6.2 million people voted for the composition of the constitutional convention on May 15-16th 2021. The Vamos por Chile coalition (right-wing) gained 37 seats, the Lista del Apruebo (center-left) gained 25 seats, Apruebo Dignidad (left) gained 28 seats, and independents gained 48 seats. The new constitution was written and voted on by the convention in 2022, and then a new popular plebiscite took place to confirm the replacement of the old constitution.

3.2.3 Hypotheses formulation

Considering the “Estallido social,” hypotheses can be formulated to guide our analysis of the persistence of memory of the victims of the Pinochet regime in Chilean political engagement. FUNK e VELASCO [120] argue that the *Estallido Social* happened due to a meltdown of institutional trust and hopelessness. However, even the authors acknowledge that initial conditions matter in this situational crisis. Here, we can hypothesize that collective memory can play a special role in these conditions.

Our first hypothesis is about protests. As mentioned in the background on Chilean democracy, people in the country used strikes and protests during the Pinochet government to put pressure on democratization when the electoral process was tainted by fraud. The tendency to protest may be more pronounced in areas where the iron fist of repression was more heavily felt. As TICCHI *et al.* [68] argue, collective memory can be a significant driver of resistance against authoritarianism. However, we can also argue that this memory of repression can persist even after democratization is achieved and drive protests, as seen in the *Estallido Social*.

Hypothesis 1: Memories on Pinochet regime’s victims led to more political claims through protests.

A second hypothesis concerns the demand for electoral participation. Even at the end of Pinochet’s regime, the democratic governments remained based on the 1980 constitution, with only minor revisions since then. This has sparked criticism of its undemocratic nature. People who were affected by authoritarian repression may be more vocal in this criticism. The demand for a new constitution emerged in large protests, such as *La Marcha más grande de todas*. The vandalism of the Jaime Guzmán memorial can be seen as a protest against the constitution he contributed to. The creation of a new constitution became the main concession the Piñera government offered in response to the 2019-2020 protests.

Hypothesis 2a: Memories on Pinochet regime’s victims led to more voting participation.

VELASCO [121] argues that the rejection of neoliberal policies is unlikely to explain the *Estallido Social*: leaders of anti-liberal movements, such as the Communist Party, the Teacher’s Union, and ‘No + AFP’ (anti-privatized pension movement) failed to get a seat in the convention. A notable characteristic of Chilean democracy is that the hybrid constitutional features inherited from Pinochet lead to dissatisfaction with political parties. Specifically, there is general social complaint that parties are increasingly disconnected from civil society [122]. Sensitivity to flawed participation may also be higher where participation was more violently suppressed in the past. Velasco argues that the root of

the Chilean constitutional revolution was the demand for more participatory democracy. This demand is something that the formation of *cabildos populares* for public discussion during the protests might be seen as evidence of.

Hypothesis 2b: Memories on Pinochet regime’s victims led to more claims to more voting accountability of politicians.

3.3 Quantitative Data and Methodology

This section describes the specification, data, and methodology of the estimations used to test the hypotheses discussed in subsection 3.2.3.

The econometric specification is inspired by BAUTISTA *et al.* [72] on the effects of Pinochet repression on the plebiscite of 1988 that voted for the end of the Chilean Military regime. Thus, the general equation is as follows:

$$poli = f(repre, Controls, FE), \quad (3.1)$$

, where *poli* is the political mobilization variable for protests and constituent plebiscite, *repre* is the variable for political repression from the Pinochet era, and the presence of Controls related to demography, geography, and politics pre-Pinochet. FE is the state (Región) level dummy.

Considering hypotheses 1, 2a, and 2b, our general initial hypothesis is that of dictatorship memory and institutional persistence: localities that were more affected by the Military regime’s repression protested more in the Estallido Social. In addition, they engaged more in voting for a new Constitution to replace the last one designed by the Pinochet government.

To test these quantitative hypotheses, we have constructed a database of 328 municipalities (*Comunas*)². See Appendix B for a detailed description of the data and its sources. We use least squares to evaluate the conditional mean between the results of the protests or plebiscite and the presence of repression centers, as our methodology is inspired by BAUTISTA *et al.* [72]. As seen by this work, the placement of military bases in Chile before 1970 was related to national security issues. The authors argue that the establishment of military bases was not correlated with the city inhabitants’ right-wing or left-wing orientation - the government in both directions almost equally contributed to the construction of these bases. Besides, correlational analysis suggests that there is no clear association between the presence of military bases and turnout or electoral outcome in the ’70-’73 elections, nor education. However, Pinochet used the military bases as centers of deten-

²This city-level approach has an advantaged over higher granularity data to assess the effects of social memory as it reduces the interference of other centers of memory diffusion within the same municipality, such as schools.

tion and torture of dissidents in his regime. Therefore, they are highly correlated with victimization. BAUTISTA *et al.* [72] also argue that, when controlled by the 1970 election results, the use of military presence fixes the influence of the political orientation of a locality prior to Pinochet and gives a net effect of existence of past repression centers on contemporary variables of political attitudes. However, the authors argue that weighting the estimates for the population is strategic for analyzing socio-political action because it gives more focus and equal treatment to individual behavior, irrespective of the size of the municipality.

To further investigate the mechanisms behind the effects of repression centers and contemporary democratic demands, we analyzed indicators of political victimization during Pinochet's regime, such as the number of victims or residents who were victims per 10,000 inhabitants. Besides, a measure of contemporary social memory using social media users remembering the '73 coup is also assessed. Using 2SLS, we estimated the victimization rates and the intensity of contemporary remembrance as independent variables and the presence of military bases prior to 1970 as the instrumental variable. This allowed us to test if the recollection of higher casualties plays a significant role in explaining the effects.

3.4 Econometric results

In this section, we can assess the empirical effects on the social mobilization influenced by the local memory of political repression in the Pinochet era.

3.4.1 Protests and Constituent Plebiscite Turnout

Table 3.1 indicates that localities with pre-1970 military bases had higher levels of protest during the "*Estallido Social*". The decomposition in Table 3.1 shows that the effects were significant for both peaceful protests and violent riots, in similar proportions. The results are in line with the expectation that the memory of Pinochet's victims made residents more aware of state repression and led to more protests.

The LS estimates suggest that the presence of military bases in a municipality, on average, resulted in nearly 1 protest per 10,000 inhabitants during the *Estallido Social*, about 30 years later. Additionally, areas with pre-1970 military bases had slightly higher levels of violent riots compared to those without such bases.

Table 3.1: LS Estimates: Protests/10k Habs - Decomposition)

	Pacific	Riots	Total
<i>Pre-70 Bases</i>	0.458*** (0.144)	0.522*** (0.144)	0.979*** (0.279)
LS Adjusted R ²	0.730	0.583	0.680
LS F-statistic	41.221	21.804	32.539
p-value (LS F-statistic)	0.000	0.000	0.000
State Dummies	x	x	x
Controls	x	x	x
N. Obs.	328	328	328

Notes: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. All regressions have control for distance to Santiago and regional capital, 2017 population and rural share, and vote shares for Allende and Alessandri in 1970. Weights: 2017 population. Coefficient in bold, cluster-robust (at comuna level) standard errors in parentheses.

3.4.2 Constituent approval

However, the data in Table 3.2 shows that in areas with pre-1970 military bases, voter participation in the constituent plebiscite was lower. The first column of Table 3.2 presents this result, which shows that if a municipality had a military base built prior to 1970, it experienced, on average, a decrease of more than 5% in its rate of participation in the 2020 plebiscite.

We can also examine the impact of repression centers on constituent approval. Table 3.2 also presents the regression results for the percentage of constituent approval (second column) and the percentage of full popular convention given the constituent approval (third column). The data shows that there is little evidence that areas near the repression centers of the Chilean military regime voted more for the constituent or a more “radical” assembly composition.

3.4.3 Results of Elections on the Constitutional Convention composition

Now, we can examine the impact of the presence of Pinochet repression centers on the elections of constituent assembly members. As shown in Table 3.3, the presence of pre-1970 constructed military bases resulted in even lower voter turnout than in the case of constituent approval: municipalities with these bases had an average participation rate that was nearly 8% lower than in other municipalities.

Second, third and fourth columns of Table 3.3 present the results of voting for the coalitions Vamos Por Chile (right and center-right parties), Lista del Apruebo (center-left),

Table 3.2: LS Estimates: (Approval of Constituent)

	Turnout	Approval	Popular Convention
<i>Pre-70 Bases</i>	-5.261*** (1.171)	4.339 (2.990)	3.661 (2.751)
LS Adjusted R ²	0.731	0.681	0.630
LS F-statistic	41.298	32.764	26.290
p-value (LS F-statistic)	0.000	0.000	0.000
State Dummies	x	x	x
Controls	x	x	x
N. Obs.	328	328	328

Notes: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. All regressions have control for distance to Santiago and regional capital, 2017 population and rural share, and vote shares for Allende and Alessandri in 1970. Weights: 2017 population. Coefficient in bold, cluster-robust (at comuna level) standard errors in parentheses.

and Apruebo Dignidad (left). It can be concluded that there is little differences about the voting preference of municipalities that have been more affected by past authoritarian repression. In areas where there were old repression centers, there was no electoral punishment for the right-wing coalition aligned with the president, nor was there a preference for left-wing opposition coalitions.

3.4.4 Almost a backlash? Results of 2021 Presidential Elections

By the end of 2021, the impact of the *Estallido Social* was noticeable in the Chilean presidential elections. One of the favorite candidates was the far-right Jose Antonio Kast. As president of the Chilean Republican Party in 2019, he was one of the most vocal proponents of the Emergency State against the *Estallido Social* [123]. In 2021, Kast claimed the legacy of Pinochet in his electoral run. He was the son of a Nazi soldier and the brother of a former Pinochet minister (Bell, n.d.), and he argued that “If Pinochet were alive, he would vote for him” [124]. During the *Estallido Social*, he also claimed that it represented that “Violence was winning the peace”. Law and order would be his main electoral platform [125], not only against social unrest but also against immigrants (Bell, n.d.). In the first round on November 21, Kast was the front-runner, obtaining 27.9% of the votes, while in second place, the left-wing Gabriel Boric (former student activist and representing the Apruebo Dignidad coalition) gained 25.8%. This result was seen by political analysts as a risk of a political backlash from the *Estallido Social* [126]. In the second round, Gabriel Boric pursued a conciliatory tone with welfare state proposals [127]. On December 19, Boric won against Kast with 55.87% to 44.13%, in a record of voting participation (8,363,910 votes - 55.64% turnout).

Table 3.3: LS Estimates: (Composition of Convention)

	Turnout	Vamos	Lista	Dignidad
<i>Pre-70 Bases</i>	-8.108*** (1.136)	-4.050 (2.756)	1.608 (1.145)	-2.390 (3.423)
LS Adjusted R ²	0.669	0.630	0.339	0.396
LS F-statistic	31.077	26.285	8.624	10.762
p-value (LS F-statistic)	0.000	0.000	0.000	0.000
State Dummies	x	x	x	x
Controls	x	x	x	x
N. Obs.	328	328	328	328

Notes: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. All regressions have control for distance to Santiago and regional capital, 2017 population and rural share, and vote shares for Allende and Alessandri in 1970. Weights: 2017 population. Coefficient in bold, cluster-robust (at comuna level) standard errors in parentheses.

An important robustness check is to determine if the lack of electoral participation due to the memories of past repression centers remains even when faced with a Pinochet-aligned candidate. Table 3.4 presents the estimates for the first-round turnout and voting for the two leading candidates in columns 1 to 3. The fourth and fifth columns present the results for the second-round turnout and voting for José Kast. The results are consistent with previous findings: a significant and negative effect on electoral turnout in municipalities with military bases; and, no increased effort to vote for Boric or against Kast.

Table 3.4: LS Estimates: Votes (2021 1° and 2° Presidential Voting)

	Turnout (1°V)	Kast (1°V)	Boric (1°V)	Turnout (2°V)	Kast (2°V)
<i>Pre-70 Bases</i>	-6.573*** (1.099)	-1.801 (2.018)	1.612 (2.136)	-3.616* (1.916)	-3.026 (2.825)
LS Adjusted R ²	0.648	0.737	0.761	0.518	0.736
LS F-statistic	28.352	42.670	48.328	16.990	42.509
p-value (LS F-statistic)	0.000	0.000	0.000	0.000	0.000
State Dummies	x	x	x	x	x
Controls	x	x	x	x	x
N. Obs.	328	328	328	328	328

Notes: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. All regressions have control for distance to Santiago and regional capital, 2017 population and rural share, and vote shares for Allende and Alessandri in 1970. Weights: 2017 population. Coefficient in bold, cluster-robust (at comuna level) standard errors in parentheses.

3.4.5 The constitutional wave crashes: the rejection of the new constitutional draft

In the 2022 Chilean constitutional referendum, citizens were asked if they approved of the new draft constitution proposed by the Constitutional Assembly elected in 2021. This new draft was the result of negotiations among various political and social groups and aimed to address issues such as economic inequality, lack of indigenous representation, and concentration of power - considered by the Assembly to be a social legacy of Pinochet's constitution [128].

The referendum took place on September 4th, 2022, with mandatory voting. The results of the vote were decisive, with 61.89% of voters rejecting the draft constitution and 38.11% supporting it, according to SERVEL.

This outcome was a major blow to President Gabriel Boric's government which had supported it. It was also a victory for the country's opposition coalition and social movements, who had campaigned against the draft. Factors that may have contributed to the rejection of the draft included fake news [129], unpopularity of Assembly politicians, opposition to the Plurinational state design, and skepticism about the economic sustainability of social programmatic guidelines [130]. Public opinion surveys prior to the referendum suggested rejection of the draft would increase political polarization, but could also lead to increased employment, lower inflation, more organized migration policies, and economic growth [131].

The failure of the draft constitution has left Chile at a crossroads, with some calling for new negotiations and discussions to find a way forward. A minority have suggested amending the current constitution, but social actors overall have called for a completely new constitution to be written from scratch [132].

The impact of the presence of military bases on the outcome of the exit plebiscite is analyzed in Table 3.5. As seen in previous tables, municipalities that had military bases prior to 1970 did not exhibit a higher voter turnout in favor of the proposed constitution. Despite the requirement of mandatory voting, the decreased voter turnout still had a significant effect.

3.5 Mechanism analysis

3.5.1 Victimization as a mechanism

But what makes the military bases constructed before 1970 relevant to the local divergence in political engagement? In this section we investigate how the memories of political victims may be one mechanism that explains contemporary political behavior. As previously stated, the construction of these military bases prior to the Allende regime was

Table 3.5: LS Estimates: Exit Plebiscite

	Turnout	Approval
<i>Pre-70 Bases</i>	-2.651* (1.419)	1.226 (2.518)
LS Adjusted R ²	0.625	0.749
LS F-statistic	25.748	45.349
p-value (LS F-statistic)	0.000	0.000
State Dummies	x	x
ContrLS	x	x
N. Obs.	328	328

Notes: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. All regressions have control for distance to Santiago and regional capital, 2017 population and rural share, and vote shares for Allende and Alessandri in 1970. Weights: 2017 population. Coefficient in bold, cluster-robust (at comuna level) standard errors in parentheses.

not connected to the political stance of the central government, but the Pinochet regime used them as repression centers.

Table 3.6 presents the impact of pre-70 military bases on two measures of political victimization during the Chilean military dictatorship: the number of victims in a locality per 10,000 inhabitants, and the number of residents who were victims per 10,000 inhabitants. Both results suggest that the presence of military bases was indeed associated with higher victimization. Municipalities with military bases built before 1970 had 2.5 more victims and 1.8 more victimized residents per 10,000 inhabitants.³ These estimates form the first stage of the 2SLS regressions that follow.

In table 3.7, we re-estimate the regressions concerning the protests in 2019-2020 and the electoral behavior during the constitutional reform initiative and presidential elections⁴. Now, these are 2SLS estimates in which the victimization rate is the independent variable and the presence of pre-70 bases is the instrumental variable. The estimates go in line with the found about military bases: the higher was the relative number of victims or victimized residents, the higher was the relative number of protests, but no more effort to punish the incumbent right and even lower electoral participation during the constituent process and even in the presidential run against a Pinochetista. The results suggests that memories of victimization during the Pinochet Regime is a relevant mechanism behind the political behavior in Chilean municipalities with military bases.

³This result aligns with the findings of BAUTISTA *et al.* [72]. The authors also discovered that the presence of military bases did not have an impact on unemployment, migration, or investment in public goods during the dictatorship.

⁴The complete estimates are available on request

Table 3.6: LS Estimates : Effect of Presence of pre-70 bases on Pinochet victimization

	Victims	Victim residents
<i>Military Base</i>	2.541*** (0.442)	1.803*** (0.319)
LS Adjusted R ²	0.689	0.599
F-statistic	29.970	20.582
Prob (F-statistic)	0.000	0.000
State Dummies	x	x
Controls	x	x
N. Obs.	289	289

Notes: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. All regressions have control for distance to Santiago and regional capital, 2017 population and rural share, and vote shares for Allende and Alessandri in 1970. Weights: 2017 population. Coefficient in bold, cluster-robust (at comuna level) standard errors in parentheses. IV F-statistic is the Cragg-Donald weak instrument test.

3.5.2 Contemporary memory, past victimization and present political engagement

To delve deeper, can we explore the correlation between past repression centers and current political engagement through the lens of contemporary social memory? Measuring the role of social memory, which is defined as the collective recollection of past events, can be challenging. Nevertheless, recent studies suggest that social media platforms, such as Twitter, can provide valuable resources for analyzing social memory, as exposed by SUMIKAWA *et al.* [133]⁵. Twitter was the fourth most used social media in Chile in 2019, according to the agency StatCounter [134].

One approach to studying the connection between past political victimization and social memory is by identifying trending topics related to historical events and collecting tweets about them. For example, on the anniversary of the military coup on September 11th, 2019, prior to the Estallido, we identified the Chilean trending topics associated with the event. Among these topics, we selected the top five related to the remembrance of violence⁶, namely “Golpe de Estado,” “Allende,” “Allende Vive,” “#11Septiembre1973,” and “#NiPerdonNiOlvido.” We then gathered a sample of 26,238 tweets from 16,223 accounts that used one of these topics, utilizing the web scraping tool *exportdata.io*.

To measure social memory, we determined the municipalities where the users who tweeted the selected terms were located. We opted for the least ambiguous reference to a

⁵However, it is important to acknowledge the limitations of this approach. Twitter users may not be representative of the broader population, so the findings should be interpreted with caution. For example, there might be a potential bias towards younger users on the platform. Despite this limitation, it is worth considering the *persistence* of social memory through new generations.

⁶The topic “Pinochet”, for instance, were largely used by Pinochetistas, so the results might be more ambiguous.

Table 3.7: Mechanism Analysis: 2SLS estimates - Victimization

Dependent Variables	Independent Variables			
	Victims/10k Inhab.		Victim Resid./10k Inhab	
Total Protests	0.360***	(0.137)	0.507***	(0.180)
Pacific Protests	0.174**	(0.070)	0.245***	(0.091)
Violent Riots	0.186***	(0.069)	0.262***	(0.092)
Turnout (Const. Initiative)	-1.980***	(0.355)	-2.790***	(0.626)
Approval (Const. Initiative)	0.982	(0.922)	1.384	(1.366)
Const. Convention	0.787	(0.859)	1.109	(1.264)
Turnout (Composition)	-3.212***	(0.475)	-4.526***	(0.847)
Vamos	-0.653	(0.844)	-0.920	(1.239)
Lista	0.980	(0.600)	0.931	(0.898)
Dignidad	-1.519	(1.418)	-2.140	(2.021)
Turnout (1° Pres. Round)	-2.391***	(0.325)	-3.369***	(0.652)
Boric (1° Pres. Round)	0.072	(0.687)	0.101	(0.972)
Kast (1° Pres. Round)	-0.200	(0.677)	-0.282	(0.965)
Turnout (2° Pres. Round)	-1.535**	(0.684)	-2.163**	(1.004)
Kast (2° Pres. Round)	-0.588	(0.953)	-0.828	(1.386)
Turnout (Exit Plebs.)	-0.969**	(0.445)	-1.365**	(0.587)
Approval (Exit Plebs.)	-0.160	(0.847)	-0.226	(1.186)

Notes: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. All regressions have control for distance to Santiago and regional capital, 2017 population and rural share, and vote shares for Allende and Alessandri in 1970. Weights: 2017 population. Coefficient in bold, cluster-robust (at comuna level) standard errors in parentheses. Cragg-Donald F-Test (Victims) = 65.147, and Cragg-Donald F-Test (Victim residents) = 40.451.

Table 3.8: LS Estimates: effect of repression centers on memories in social media

	Independent Variable
	TwitterAcc / 10k Inhab
<i>Military Base</i>	4.222** (1.823)
OLS Adjusted R ²	0.619
OLS F-statistic	25.124
p-value (OLS F-statistic)	0.000
State Dummies	x
Controls	x
N. Obs.	328

Notes: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. All regressions have control for distance to Santiago and regional capital, 2017 population and rural share, and vote shares for Allende and Alessandri in 1970. Weights: 2017 population. Coefficient in bold, cluster-robust (at comuna level) standard errors in parentheses.

single Chilean comuna, resulting in a total sample of 2,623 users. Next, we calculated the number of users remembering the coup per 10,000 inhabitants in each municipality, creating a measure of social memory. We employed this measure to examine the relationship between past political victimization, social memory, and current political engagement.

We conducted several regression analyses to explore this relationship. In one analysis, a linear regression was estimated using the least squares method to examine the connection between the presence of military bases and the number of Twitter users remembering the '73 coup. The results presented in Table 3.8⁷ indicated that municipalities with pre-1970 military bases had more remembrance of the coup on Twitter, with 4.2 more accounts per ten thousand inhabitants than municipalities without these bases.

Another analysis utilized a 2SLS regression to investigate the correlation between past victimhood and Twitter users remembering the '73 coup, using pre-1970 military bases as an instrument. The results, shown in Table 3.9, indicate that the more political victims of Pinochet there were in a given municipality, the more remembrance of the coup there was on Twitter. Specifically, one victim per 10k inhabitants was related to 1.6 accounts remembering the '73 coup, and one victim resident per 10k inhabitants was related to 2.2 accounts remembering the '73 coup.

Lastly, we utilized 2SLS regressions to analyze the relationship between Twitter users' remembrance of the coup and political engagement in the Constitutional revolution. The results in Table 3.10 suggest that there is a positive correlation between remembrance of the coup on Twitter and protests, less participation in the Constitutional process, and no increased effort to punish the right.

⁷The complete estimates are also available on request

Table 3.9: 2SLS estimates (Presence of pre-70 bases as instrument)

	Independent Variables	
	TwitterAcc/ 10k Inhab	TwitterAcc/ 10k Inhab
<i>Victims/10k inhabs</i>	1.567*** (0.472)	
<i>Victim residents/10k inhabs</i>		2.208*** (0.571)
IV F-statistic	65.147	40.451
State Dummies	x	x
Controls	x	x
N. Obs.	289	289

Notes: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. All regressions have control for distance to Santiago and regional capital, 2017 population and rural share, and vote shares for Allende and Alessandri in 1970. Weights: 2017 population. Coefficient in bold, cluster-robust (at comuna level) standard errors in parentheses. IV F-statistic is the Cragg-Donald weak instrument test.

But is collective memory truly the determining factor driving political behavior in the presence of past repression centers? One could argue that the existence of military bases can result in divergent policy implementation and varying levels of investment in public goods across different municipalities. This becomes particularly relevant when political repression gives rise to a dynasty of local politicians who support dictatorship [135] or when descendants of the repressed individuals are involved [61]. Following BAUTISTA *et al.* [72], we also explored alternative mechanisms that could influence political behavior. The results, presented in Table 3.11, indicate that there is no significant divergence among municipalities in terms of public good investment (such as healthcare or education) or unemployment.

Overall, the findings of this study suggest that social memory plays a likely role in contemporary political engagement. Additionally, Twitter can be a useful tool for measuring social memory and providing valuable insights into the correlation between past political victimization and present-day political engagement.

Table 3.10: Mechanism Analysis: 2SLS estimates - Remembrance

Dependent Variables	Independent Variables	
	Twitter Acc/10k Inhab.	
Total Protests	0.232***	(0.083)
Pacific Protests	0.108***	(0.037)
Violent Riots	0.124***	(0.047)
Turnout (Const. Initiative)	-1.246***	(0.458)
Approval (Const. Initiative)	1.028	(0.904)
Const. Convention	0.867	(0.797)
Turnout (Composition)	-1.920**	(0.765)
Vamos	-0.959	(0.830)
Lista	0.280	(0.356)
Dignidad	-0.566	(0.859)
Turnout (1° Pres. Round)	-1.557**	(0.626)
Boric (1° Pres. Round)	0.382	(0.531)
Kast (1° Pres. Round)	-0.427	(0.551)
Turnout (2° Pres. Round)	-0.856	(0.557)
Kast (2° Pres. Round)	-0.717	(0.806)
Turnout (Exit Plebs.)	-0.628***	(0.180)
Approval (Exit Plebs.)	0.290	(0.628)

Notes: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. All regressions have control for distance to Santiago and regional capital, 2017 population and rural share, and vote shares for Allende and Alessandri in 1970. Weights: 2017 population. Coefficient in bold, cluster-robust (at comuna level) standard errors in parentheses. Cragg-Donald F-test = 40.829.

Table 3.11: Alternative Mechanism Analysis: LS estimates

	Desemp/hab	Inv Edu/Alumno	Inv Health/Inhab
<i>Military Base</i>	-0.001	-9.048	-0.203
	(0.007)	(7.870)	(0.174)
OLS Adjusted R ²	0.055	0.111	0.144
OLS F-statistic	1.823	2.840	3.436
p-value (OLS F-statistic)	0.000	0.000	0.000
State Dummies	x	x	x
Controls	x	x	x
N. Obs.	314	324	305

Notes: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. All regressions have control for distance to Santiago and regional capital, 2017 population and rural share, and vote shares for Allende and Alessandri in 1970. Weights: 2017 population. Coefficient in bold, cluster-robust (at comuna level) standard errors in parentheses.

3.6 Discussion

The overall evidence suggests that the memory of Pinochet's repression did not generalize into increased electoral turnout or pressure for more electoral accountability. In areas where there was more repression, there was no greater participation in constitutional change or increased tendency to vote for or against incumbent coalitions.

This result aligns with the findings of two pieces of literature. First, BAUTISTA *et al.* [72] argues that the effects of past Pinochet repression on votes for the Concertación decreased with each electoral run, so it can be inferred that it had little influence on voting for the right-wing coalition of parties that were not historically affiliated with the Concertación. Second, according to a public opinion survey conducted by CERC [136] 40 years after the military coup of 1973, there was a significant increase in the percentage of people who rejected the necessity of military coups, from 48% in 2003 to 68% in 2013. However, 41% of the people interviewed in 2013 attributed the responsibility for the 1973 coup to Pinochet himself, 6% to the military, and only 2% to the right (compared to 34%, 7%, and 4%, respectively, in 2003). These results indicate an increasing detachment of most actors and institutions from the military regime by the public opinion.

Since municipalities with more victims saw more protests, what influenced people affected by Pinochet's repression to take to the streets, other than increased political participation, more public services, or punishment for the incumbent party? The literature on protests discusses the backfire of police repression of unarmed protests and emphasizes the role of communication infrastructure in the scalability of protests (see SUTTON *et al.* [137]). Here, we can infer that past memories of institutional violence may be a driving factor.

There was a late, small but existent effort to convict former army chiefs and reform the armed forces to eliminate the remnants of Pinochet's organization [138], but little was done to the police. Despite pressure on the incumbent government to reform the Carabineros due to human rights violations during the 2019 protests, the initiatives remained paralyzed (Torres, 2021) by them; only the Constitutional Convention in 2021 pushed forward the reform initiative to end the militarization of the police system [139].

State violence was present in almost all the *Estallido Social* incidents; the mobilization increased when the first clashes between students and Carabineros occurred, and it spread throughout the country following the imposition of the emergency state. It began to scale down when the president revoked this decree.

According to STERN [76], the process of political memory in Chile involves competing selective memories. This is likely due to the fact that supporters of Pinochet remain influential, making it difficult to hold the political leaders of the dictatorship accountable for their victims. As a result, Chilean society experiences oscillation between periods of caution and periods of conflict. Our empirical findings suggest that the selective memo-

ries of Pinochet's victims may lead Chilean society to resist violence in general, but are unable to connect this contemporary violence to specific actors or institutions that were preserved from the dictatorship.

Following the discussion in BOUCHER [61], political repression can have psychological implications such as the fear of political persecution [140] or polarization towards out-groups [141]. In our case, the findings do not suggest that Pinochet's repression led to a culture of fear regarding state violence or the right-wing, for two reasons: Firstly, people demonstrated the courage to participate in street protests. Secondly, the Chilean voting process is confidential and claimed to be fair [142], which makes it unlikely that voters from the opposition would face retaliation⁸. On the other hand, both quantitative and qualitative analyses indicate that memories of past repression may contribute to polarization against political actors, perceiving them as an "out-group class." This finding aligns with the literature on the uprooting of both right-wing and left-wing political factions in Chile [122].

To summarize, the cultural aspect that persisted in the *Estallido Social* was the revolt against state violence itself, following the police confrontation against early protesters who were against the adjustment of subway fares in Santiago. Sensitivity to state violence motivated people affected by past victims' memories to protest (hypothesis 1). However, it did not motivate people to go to the voting booth to demand more accountability through more participatory institutions or punish unresponsive incumbent parties (hypotheses 2a and 2b).

3.7 Conclusion

In this work, we investigate the persistence of collective memory of past institutional violence in present political engagement in democracies. The case of Chile provides an extreme example of a situation where the legacy of a military regime was often cited as a latent driver of street protests that led to a plebiscite for constitutional change.

The findings suggest that municipalities with more pre-1970 military bases saw higher levels of protests during the *Estallido Social*, but also had lower participation in the plebiscite and in electing constituent members. There was also no punishment of the incumbent coalition or preference for the opposition. The mechanism analysis also suggests that victimization during the Pinochet era could be a significant factor in shaping political behavior.

In the case of Chile, other factors could drive the specific demand for a new constitution, such as general emotions of broken expectations and institutional mistrust, as theorized by FUNK e VELASCO [120] and as studied by PASSARELLI e TABELLINI

⁸This lack of fear suggests that Chilean collective memory diverges from the autobiographical memory found in BAUTISTA [62]

[55] and [56]. However, for the scope of the collective memory of victims of Pinochet, our evidence suggests that this Chilean cultural legacy leads affected people to make their claims through protests in the streets rather than voting in the booth.

This evidence suggests that the violent management of armed forces is a particularly sensitive topic for collective memory and public opinion in democratic societies. A significant implication is that proper institutional reform combined with investigations of human rights violations by authoritarian regimes are essential for social peace in democratizing countries [143].

Chapter 4

Tales of the Fall and Rise of (In)egalitarian Democracy: The Case of Argentina (1913-1999)

In general, the literature on democratization and inequality emphasizes that the adoption of a democratic regime incentivizes voters below the national income average to vote for income redistribution in their favor. However, it is important to note that this approach is primarily based on events in developed countries. These countries typically have unique paths to transition from absolutist states and constitutional monarchies to democracies, often undergoing a prolonged and nearly continuous process of democratization and expansion of suffrage rights due to popular pressure.

This study examines the egalitarian aspect of democracy in the context of Argentina, considering the political and institutional peculiarities of Latin America. The methodology of this research adopts a multi-method approach, employing quantitative methods such as ARDL and Granger non-causality analysis, as well as qualitative methods like congruence analysis. The findings indicate a long-term relationship between the democratization process in Argentina and the increase in income inequality. However, there is also evidence of a rise in the proportion of income allocated to workers.

The qualitative historical analysis suggests that this relationship stems from wage dispersion caused by economic shocks and income redistribution aimed at appeasing the middle class for electoral purposes.

4.1 Introduction

The primary objective of this study is to investigate the impact of democratization on economic inequality within the institutional framework of Argentina. As a prominent nation in Latin America, marked by a history of alternating periods of dictatorship and

democracy, this article seeks to analyze the political and economic factors that potentially contribute to wage disparities and the emergence of redistributive pressures that favor the middle class.

In general, the existing literature in political science and political economy supports the argument that democracy promotes economic equality [144]. According to the conventional model, the introduction of a democratic regime provides an incentive for voters below the national income average to support income redistribution in their favor. Furthermore, in countries with significant income inequality where the median voter consistently falls below the national income average, there is typically a genuine electoral incentive for policymakers to pursue redistributive policies [45].

From a historical perspective, it has been argued that the establishment of democratic institutions would lead to credible and long-term income redistribution from the elites to the lower classes, aiming to reduce the risk of continuous social instability. However, it is important to note that this argument is primarily based on events in developed countries like the United Kingdom, Sweden, France, and Germany [145]. These countries have followed particular models of transitioning from absolutist states and constitutional monarchies to democracies through a prolonged and almost continuous process of democratization, accompanied by an expansion of suffrage rights [146]. While some parts of the literature focus on individual cases where political regimes alternate, suggesting that higher inequality leads to alternation [147], it remains open to case study evaluation whether this uneven democratic process can also result in economic inequality.

Besides, in contrast to the traditional literature, some authors suggest that economic inequality can actually increase after the period of democratization, broadly understood. According to the Director's law, the focus on appealing to the median voter for electoral purposes may prompt rulers to redistribute income from both the rich and the poor to the middle class, as this group holds the greatest influence in electoral races [148]. In some cases, democracy can be captured by the elites, thereby perpetuating the economic inequality observed during autocratic periods. The "opening range of market opportunities" could potentially lead to greater social inequality due to the heterogeneity within previously excluded groups, as seen, for instance, in South Africa. Income disparities may also arise when democratic governments relax labor repression measures that were present during autocratic regimes, consequently promoting structural transformation [144].

This study aims to examine the egalitarian aspect of democracy within the historical context of Latin America, with a focus on Argentina. Latin America offers a relevant environment for researching the relationship between social inequality and democratic institutions, given its political and institutional characteristics that can apply to other developing countries.

The discussion surrounding the functioning of democracy in Latin America often revolves around the concept of delegative democracy. According to Guillermo O'Donnell,

delegative democracy is a form of democratic arrangement and culture that emerges in nations with a recent authoritarian past. This system is characterized by a significant concentration of power in the hands of the president and a cultural perception that the president is the moral authority responsible for a national project, with little emphasis on the importance of other democratic institutions or mechanisms for horizontal accountability. Although not considered a representative democracy by O'Donnell, this form of representation, despite having free elections and advanced protection of civil and political rights, still retains elements of the endurance of democracy and political inequality present in dictatorships [149].

Christopher Larkins argues that delegative democracy in Argentina emerged in the 1980s as a response to the necessity of implementing policies to address economic crises [150]. However, the centralized and less horizontally accountable approach to democracy in the country has a historical basis [151] and continues to persist into the 21st century [152].

In the list of the ten most unequal countries at the end of the 20th century, eight of them were from Latin America, according to data provided by the World Bank Indicators [153]. Latin American democracies are susceptible to the paradox of macroeconomic populism [154], where dissatisfaction with low economic growth and social inequality leads to the emergence of rulers who implement short-term measures. These measures aim to stimulate economic growth and income distribution, often disregarding macroeconomic stability, which can result in periods of recession and increased inequality in the long run. Therefore, it is crucial to assess the long-term effects of democratization on social inequality in Latin America.

Some studies have found cross-sectional evidence that democracy in Latin America leads to increased social spending [155, 156]. However, there is limited discussion on the asymmetry of such service provision among different social groups. It is essential to conduct country-level analyses to gain a comprehensive understanding of the mechanisms and heterogeneity among groups that influence the relationship between democracy, inequality, and institutions - such analyses complement cross-country studies [157]. Argentina, in particular, is a suitable case for this analysis. Throughout the 20th century, Argentina experienced a fluctuation between autocratic and democratic regimes, which is typical in Latin American history (including caudillismo, military regimes, populist, and liberal democracies). The country also has access to long-term data sources, enabling an institutional study that covers almost the entire twentieth century. Moreover, at the end of the century, Argentina had the highest GDP per capita in South America and the second-largest in Latin America (data from 2000, in constant international dollars of 2011 PPP, according to the World Bank Indicators[158]).

The theoretical and methodological framework of this study is based on the work "Democracy, Redistribution, and Inequality" by ACEMOGLU *et al.* [144]. The authors

provide techniques and guidelines that can help explain phenomena such as the Director's Law and inequality in the competition for opportunities. They also present methodological considerations that are relevant to this research, particularly in addressing issues of endogeneity.

The study adopts a multi-method approach, utilizing both quantitative (ARDL and Granger non-causality) and qualitative (congruence analysis) methods. The estimation results indicate a long-term relationship between the democratization process in Argentina and the increase in income inequality. However, there is also evidence of an increase in the share of income distributed to workers. The qualitative historical analysis suggests that this relationship is influenced by successive economic crises, wage dispersion caused by technological shocks, and income redistribution to the middle class for electoral purposes, as theorized by the Director's Law [148].

From the perspective of Latin American legal theorist Roberto Gargarella, social equality is the governing principle of both democracy and constitutionalism [159]. According to Gargarella, inclusiveness of citizens in public debates for collective decision-making without bias or disdain is crucial. The high levels of social inequality in Latin America can be attributed to a lack of political and economic democratization, with political democracy being undermined by power concentration and economic democracy being hindered by a situation where a few make decisions for the many. Therefore, studying the dynamics of economic inequality within democratizing societies can serve as an important indicator of the effectiveness of democratic principles [159, p. 207].

4.2 Framework of Analysis

The study employs a multi-method approach, combining quantitative methods such as Autoregressive Distributed Lag (ARDL) and Granger non-causality tests, as well as qualitative methods like congruence analysis. This approach allows for a comprehensive analysis by utilizing different methodologies to address specific aspects of the research question.

The quantitative analysis focuses on estimating the equalizing effects between democratization and social inequality, as well as the share of income received by workers in Argentina. The study utilizes a long annual time series database spanning from 1913 to 1999, comprising 86 observations. The database includes indicators related to personal and functional income inequality, as well as measures of the quality of "representative" electoral democracy in Argentina. The democracy variables encompass factors such as the overall quality of democracy (Polyarchy), civil and political rights (Liberal), and the construction of civic public opinion (Deliberative). These variables are essential in assessing the openness and fairness of elections.

In addition to the democracy variables, the study incorporates a set of control vari-

ables, including output per capita, inflation, education, and trade openness of the country. These control variables help account for other factors that may influence the relationship between democratization, inequality, and income distribution. A detailed list of the variables used in the analysis can be found in Appendix C of the study.

By employing a combination of quantitative and qualitative methods and utilizing a comprehensive dataset, the study aims to provide a nuanced understanding of the relationship between democratization, social inequality, and income distribution in Argentina.

The general specification used in this quantitative work is as follows:

$$INEQ = f(DEM, GDPPC, GDPPC^2, INF, EDU, OPEN) \quad (4.1)$$

Where INEQ is the variable related to personal or functional distribution of income, DEM is the variable related to the intensity of democracy (especially the criteria related to the electoral democracy seen in Argentina); GDPPC is the gross domestic product per capita, INF is the variable related to inflation, EDU is the variable related to educational attainment, and OPEN is the variable related to economic openness.

To estimate the specification above, cointegration models are especially useful. These econometric models allow the analysis of the long-term response of the institutional variables. The ARDL (autoregressive distributed lag)¹ bound test method [161, 162] is consistent even in small samples, and it allows the use of I(0) and I(1) series, unlike other models of cointegration. These properties make the model highly usable for cliometric studies [163–165].

The ARDL model is estimated considering the following unrestricted error correction model:

$$\begin{aligned} \Delta INEQ = & \alpha_0 + \sum_{i=1}^p \varphi_i \Delta INEQ_{t-i} + \sum_{i=0}^p \mu_i \Delta DEM_{t-i} + \sum_{i=0}^p \tau_i \Delta GDPPC_{t-i} + \\ & \sum_{i=0}^p \chi_i \Delta GDPPC_{t-i}^2 + \sum_{i=0}^p \gamma_i \Delta INF_{t-i} + \sum_{i=0}^p \omega_i \Delta EDU_{t-i} + \sum_{i=0}^p \xi_i \Delta OPEN_{t-i} + \\ & \delta_1 INEQ_{t-1} + \delta_2 DEM_{t-1} + \delta_3 GDPPC_{t-1} + \delta_4 GDPPC_{t-1}^2 + \delta_5 INF_{t-1} + \delta_6 EDU_{t-1} + \\ & \delta_7 OPEN_{t-1} + \epsilon_t^0 \end{aligned} \quad (4.2)$$

where the second part of the right-hand side is the long-run relationship equation. The bound test is performed using F-statistic tests, with the null hypothesis $H_0 : \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = 0$ and the alternative hypothesis $H_1 : \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq 0$. The F-test values are compared with the critical values provided by NARAYAN [166] (for 80 observations) for the lower bound case (all variables I(0)) and the upper bound case (all variables I(1)). If the F-statistic exceeds both the lower and upper bound values, the null hypothesis of no cointegrating relationship is rejected. However, if the F-statistic does not exceed the lower bound, the null hypothesis cannot be

¹The explanations and table template follow DE MENDONÇA e ALMEIDA [160]

rejected. Finally, if the F-statistic falls between the upper and lower bound, the rejection of the null hypothesis depends on whether all variables are I(0) [160].

In addition to the bound test, the determination of the optimal lag order (p) is performed based on the minimization of R^2 . Given the presence of institutional stickiness and electoral cycles, the models are limited to a maximum of 6 lags. Acemoglu and his coauthors argue that most estimations in the literature on democracy and inequality lack the treatment of endogeneity problems [144]. As explained by KYOPHILAVONG *et al.* [167], the ARDL model provides robust T-statistics even in the case of endogeneity of the variables. Furthermore, along with the bound test and the determination of optimal lags in ARDL models, autocorrelation issues are addressed using the LM test.

Moreover, a long-run Granger non-causality test [168] was conducted. The Granger-causality model, based on an augmented (in this case, long-run) VAR model, hypothesizes that past values of one variable can significantly predict the movements of the other variable over time. This test allows us to examine the temporal precedence between democratization and economic inequality, determining which variable might precede the other in the sequence of events.

To ensure accurate inferences in the Granger causality tests, we follow the procedure outlined by Toda and Yamamoto, which involves determining the optimal number of VAR lags (k) and the highest order of integration among the series (d_{\max})². The Granger non-causality test is then performed using a modified Wald test with $(k + d_{\max})$ lags. This correction accounts for the asymptotic properties of the test, assuming the non-stationarity of any series. Therefore, the augmented long-run VAR model for the Toda-Yamamoto test is defined as follows:

$$INEQ = \alpha_1 + \sum_{j=1}^k \eta_j INEQ_{t-j} + \sum_{k+1}^{k+d_{\max}} \eta_j INEQ_{t-j} + \sum_{j=1}^k \rho_j DEM_{t-j} + \sum_{k+1}^{k+d_{\max}} \rho_j DEM_{t-j} + \sum_{j=1}^k \nu_j X_{t-j} + \sum_{k+1}^{k+d_{\max}} \nu_j X_{t-j} + \epsilon_t^1 \quad (4.3)$$

$$DEM = \alpha_1 + \sum_{j=1}^k \theta_j DEM_{t-j} + \sum_{k+1}^{k+d_{\max}} \theta_j DEM_{t-j} + \sum_{j=1}^k \pi_j INEQ_{t-j} + \sum_{k+1}^{k+d_{\max}} \pi_j INEQ_{t-j} + \sum_{j=1}^k \kappa_j X_{t-j} + \sum_{k+1}^{k+d_{\max}} \kappa_j X_{t-j} + \epsilon_t^2 \quad (4.4)$$

Where X represents the control variables, and ϵ_t^1 and ϵ_t^2 are vectors of white noise errors. The Wald test for the Toda-Yamamoto Granger non-causality model asymptotically follows a chi-square distribution with $(k + d_{\max})$ degrees of freedom. The null hypothesis (H(0)) in equations 4.3 and 4.4 states that $\rho_j = 0$ for all $j = 1 \dots r$, indicating that past values of the democracy index do not significantly explain subsequent movements in

²In addition to the unit root tests mentioned earlier, the optimal number of VAR lags was determined using the Schwarz information criterion. The stability of the models was also verified. The tests are available upon request.

income inequality. Similarly, the null hypothesis $\pi_j = 0$ for all $j = 1 \dots r$ suggests that past values of income inequality do not significantly explain subsequent movements in the democracy index.

The expected behavior of the variables in these econometric models aligns with the conventional literature on economic inequality, allowing us to identify cases where Argentina conforms to the general patterns and where it deviates from them. The complete list of variables used in the analysis can be found in Appendix C.

In the qualitative part of the methodology, the study will employ a congruence analysis [169, 170] focusing on Argentine economic and political history throughout the 20th century. The qualitative data will be derived from academic books and papers, allowing for the construction of a meta-narrative on the history of inequality in Argentina. The primary objective is to identify significant events, key actors, and relevant institutions associated with the findings obtained from the quantitative analysis. In other words, the aim is to identify any “matches or mismatches between empirical findings and specific expectations derived from core elements of theories” [170]. Additionally, the qualitative approach will also test the hypotheses proposed by ACEMOGLU *et al.* [144] regarding these phenomena.

Through congruence analysis, the study will highlight evidence that corresponds to path-dependent episodes in the long run. Subsequently, a descriptive data analysis will be conducted using the time series data to identify crucial episodes that help explain the long-term scenario.

4.3 Quantitative results

In this section, we present the econometric estimates on the relation between Argentine democratization and the long-run evolution of personal and functional income inequality in the country. After discussing general cases of egalitarian democracies and particular instances in which some equalizer forces may not apply, these results will guide the historical analysis of Argentine institutions, policies, and events, to identify specificities responsible for such outcome.

Tables 4.1, 4.2, and 4.3 show the results of ARDL estimations (the democracy variable used in table 4.1 is POLY, in table 4.2 is LIBERAL and in table 4.3 is DELIB). In all equations, the F-test values are higher than the I(0) and I(1) bounds and the cointegrating equations are highly significant, suggesting the existence of long-run relationship among the variables. Whichever the democracy variable, the results appoint a positive and significant relationship between Argentine democratization and the Gini coefficient and positive and significant relationship with the labor share in national income. This result suggests that the rise of democratic regimes in Argentina is associated to higher personal income inequality and reduced functional income inequality. Regard that the

use of past lags³ of the democracy variable is already considered in the autoregressive model. Thus, the economic ‘legacy’ of past regimes itself may not adequately explain the effects seen. Financial gains perceived by capitalists may not drive such an increase in income inequality related to Argentine democracy, but economic crises, technological shocks, or redistribution of income to the middle class. Furthermore, the other variables give evidence of the specificities of Argentine history. As displayed in all equations, Argentina does not follow the inverted-U shape trajectory of inequality as described by Kuznets curve, but it follows a more complex pattern. In personal inequality, it happened but the opposite, an U-shaped trajectory: the country reduced inequality in the middle levels of income and increased inequality in the upper levels. In function inequality, Argentina reduced labor share in the middle levels of income and increased in the upper levels. This result suggests a quadratic relationship of Argentine development and wage dispersion. As expected, inflation, in turn, showed a positive effect in Gini and a negative and in labor share. However, the educational inequality showed a negative and significant impact on Gini and negative and significant effect in labor share. This is related to the concept of Paradox of Progress [171]: since the returns to education follows a convex pattern, the dissemination of education induces wage dispersion and thus promotes income inequality and increased labor share. Finally, trade openness behaved a bit as expected: increased personal inequality and labor share due to the increase of wage premium of skilled workers and promoted wage dispersion [172]. This result does not seem to reinforce the hypothesis that neoliberal policies were the cause of unequal democracy in Argentina [173]. First, capitalists lose ground on national income. Second, even controlling for economic openness, the effect of democracy on inequality remains significant. These results motivate the focus of the qualitative analysis on the institutional history of Argentine politics.

³The number of lags was stipulated by the minimization of R^2 . However, when testing with a discretionary number of lags, the estimates using the labor share are less robust than those using the Gini index - which reinforces the counter-intuitive result. Nonetheless, these results should be interpreted with parsimony.

Table 4.1: ARDL estimation - Democracy Variable: POLYARCHY

<i>Dependent Variable: GINI - (3, 2, 2, 3, 4, 1, 5)</i>					<i>Dependent Variable: LSHARE - (2, 1, 2, 1, 0, 1, 0)</i>				
<i>Bounds test</i>			<i>Critical value bounds</i>		<i>Bounds test</i>			<i>Critical value bounds</i>	
<i>Test statistic</i>	<i>Value</i>	<i>Significance</i>	<i>I0 Bound</i>	<i>I1 Bound</i>	<i>Test statistic</i>	<i>Value</i>	<i>Significance</i>	<i>I0 Bound</i>	<i>I1 Bound</i>
<i>F-statistic</i>	4,21	10%	2,09	3,1	<i>F-statistic</i>	6,43	10%	2,09	3,1
<i>K</i>	6				<i>K</i>	6			
Cointegrating equation = $GINI - (0.068 \times POLI - 6.972 \times GDPPC + 0.400 \times GDPPC^2 + 0.083 \times INF_D - 0.326 \times EDU + 0.001 \times IMP/GDP + 30.740)$ ***					Cointegrating equation = $LSHARE - (0.040 \times POLI - 0.17 \times GDPPC - 0.065 \times GDPPC^2 - 0.137 \times INF_D - 0.973 \times EDU + 0.003 \times IMP/GDP + 0.949)$ ***				
<i>Long run coefficients</i>				<i>Long run coefficients</i>					
<i>Variable</i>	<i>Coefficient</i>	<i>Std. error</i>	<i>t-statistic</i>	<i>Variable</i>	<i>Coefficient</i>	<i>Std. error</i>	<i>t-statistic</i>		
Constant	30.740***	(7.226)	[4.254]	Constant	-2.024	(7.130)	[-0.284]		
POLI	0.068***	(0.025)	[2.761]	POLI	0.040**	(0,019)	[2.047]		
GDPPC	-6.972***	(1.644)	[-4.241]	GDPPC	0.878	(1.618)	[0.542]		
GDPPC ²	0.400***	(0,094)	[4.269]	GDPPC ²	-0,065	(0,092)	[-0.702]		
INF_D	0.083***	(0,029)	[2.852]	INF_D	-0.137***	(0,028)	[-4.908]		
EDU	-0,326	(0,218)	[-1.534]	EDU	-0.973***	(0,279)	[-3.487]		
IMP/GDP	0.131	(0.160)	[0.822]	IMP/GDP	0.298*	(0.161)	[1.850]		

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey- West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.

Table 4.2: ARDL estimation - Democracy Variable: LIBERAL

<i>Dependent Variable: GINI - (4, 3, 3, 2, 1, 0, 3)</i>					<i>Dependent Variable: LSHARE - (2, 1, 3, 1, 3, 0, 3)</i>				
<i>Bounds test</i>			<i>Critical value bounds</i>		<i>Bounds test</i>			<i>Critical value bounds</i>	
<i>Test statistic</i>	<i>Value</i>	<i>Significance</i>	<i>I0 Bound</i>	<i>I1 Bound</i>	<i>Test statistic</i>	<i>Value</i>	<i>Significance</i>	<i>I0 Bound</i>	<i>I1 Bound</i>
<i>F-statistic</i>	4,70	10%	2,09	3,1	<i>F-statistic</i>	4,04	10%	2,09	3,1
<i>K</i>	6				<i>K</i>	6			
Cointegrating equation = $GINI - (0.098 \times LIBERAL - 6.059 \times GDPPC + 0.348 \times GDPPC^2 + 0.066 \times INF_D - 0.444 \times EDU + 0.002 \times IMP/GDP + 26.788)$ ***					Cointegrating equation = $LSHARE - (0.069 \times LIBERAL - 2.763 \times GDPPC - 0.171 \times GDPPC^2 - 0.187 \times INF_D - 0.792 \times EDU + 0.002 \times IMP/GDP - 10.392)$ ***				
<i>Long run coefficients</i>				<i>Long run coefficients</i>					
<i>Variable</i>	<i>Coefficient</i>	<i>Std. error</i>	<i>t-statistic</i>	<i>Variable</i>	<i>Coefficient</i>	<i>Std. error</i>	<i>t-statistic</i>		
Constant	26.788***	(5,487)	[4.883]	Constant	-10,392	(10,628)	[-0.978]		
LIBERAL	0.098***	(0,024)	[4.115]	LIBERAL	0.069**	(0,031)	[2.264]		
GDPPC	-6.059***	(1,240)	[-4.887]	GDPPC	2.763	(2.389)	[1.156]		
GDPPC ²	0.348***	(0,070)	[4.946]	GDPPC ²	-0.171	(0.135)	[-1.268]		
INF_D	0.066**	(0.029)	[2.301]	INF_D	-0.187***	(0.046)	[-4.087]		
EDU	-0.444**	(0.187)	[-2.372]	EDU	-0.792*	(0.406)	[-1.951]		
IMP/GDP	0.242**	(0.115)	[2.095]	IMP/GDP	0.170	(0.221)	[0.772]		

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey- West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.

Table 4.3: ARDL Estimation - Democracy Variable: DELIBERATIVE

<i>Dependent Variable: GINI - (3, 3, 3, 2, 1, 1, 3)</i>					<i>Dependent Variable: LSHARE - (2, 3, 3, 1, 3, 1, 3)</i>				
<i>Bounds test</i>		<i>Critical value bounds</i>			<i>Bounds test</i>		<i>Critical value bounds</i>		
<i>Test statistic</i>	<i>Value</i>	<i>Significance</i>	<i>I0 Bound</i>	<i>I1 Bound</i>	<i>Test statistic</i>	<i>Value</i>	<i>Significance</i>	<i>I0 Bound</i>	<i>I1 Bound</i>
<i>F-statistic</i>	4,26	10%	2,09	3,1	<i>F-statistic</i>	4,27	10%	2,09	3,1
<i>K</i>	6				<i>K</i>	6			
Cointegrating equation = $GINI - (0.071 \times DELIB - 1.502 \times GDPPC + 0.417 \times GDPPC^2 + 0.83 \times INF_D - 0.443 \times EDU + 0.003 \times IMP/GDP + 1.754)$ ***					Cointegrating equation = $LSHARE - (0.051 \times DELIB - 0.34 \times GDPPC - 0.157 \times GDPPC^2 - 0.186 \times INF_D - 0.754 \times EDU + 0.001 \times IMP/GDP + 0.596)$ ***				
<i>Long run coefficients</i>				<i>Long run coefficients</i>					
<i>Variable</i>	<i>Coefficient</i>	<i>Std. error</i>	<i>t-statistic</i>	<i>Variable</i>	<i>Coefficient</i>	<i>Std. error</i>	<i>t-statistic</i>		
Constant	32.021***	(7,665)	[4.178]	Constant	-9.253	(10.196)	[-0.908]		
DELIB	0.071***	(0.022)	[3.191]	DELIB	0.051**	(0.023)	[2.184]		
GDPPC	-7.261***	(1.733)	[-4.189]	GDPPC	2.512	(2.290)	[1.097]		
GDPPC ²	0.417***	(0.098)	[4.241]	GDPPC ²	-0.157	(0,129)	[-1.217]		
INF_D	0.083**	(0,037)	[2.223]	INF_D	-0.186***	(0.043)	[-4.328]		
EDU	-0.443*	(0.231)	[-1.923]	EDU	-0.754*	(0.422)	[-1.788]		
IMP/GDP	0.289*	(0.160)	[1.804]	IMP/GDP	0.142	(0.231)	[0.611]		

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey-West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.

Table 4.4: Granger-non-causality test

Hypotheses	χ^2 Tests	d.f	CV 10%
POLI non-cause GINI	6.551*	2	4,605
GINI non-cause POLI	4,140	2	4,605
POLI non-cause LABOUR	2,306	2	4,605
LABOUR non-cause POLI	2,342	2	4,605
LIBERAL non-cause GINI	6.479*	2	4,605
GINI non-cause LIBERAL	3,284	2	4,605
LIBERAL non-cause LABOUR	0,883	2	4,605
LABOUR non-cause LIBERAL	2,615	2	4,605
DELIB non-cause GINI	5.911*	2	4,605
GINI non-cause DELIB	3,026	2	4,605
DELIB non-cause LABOUR	0,718	2	4,605
LABOUR non-cause DELIB	2,166	2	4,605

Obs: (*) denotes significance if compared to the critical value.

Table 4.4 presents the Long-run Granger non-Causality test results between the democracy variables and the income inequality variables. Even though the equations with labor share remained inconclusive, in all equations where Gini is the income inequality variable, the χ^2 tests rejected the H (0) of democracy non-cause personal income inequality. However, the tests did not reject the hypothesis that personal income inequality “non-cause” democracy. These results suggest that the relationship between democracy and Gini is unidirectional: democracy arose first in Argentina, and personal income inequality increased later.

4.3.1 Labor Share Decomposition

To understand the dynamics of democratization in relation to functional inequality within the working class, this subsection presents the ARDL and Granger non-causality estimates considering the labor share of rural, informal urban, and formal urban workers in the national income.

Table 4.5 presents the ARDL estimates, and Table 4.6 presents the Granger non-causality estimates. It can be observed that there is a significant relationship between democracy has and the share of all three sectors. Higher levels of democracy is related to reduction the share of rural workers in the national income and increase the share of formal urban workers; however, there is also a increase the share of the informal urban sector. The Granger non-causality tests reveal new counter-intuitive results: it is robustly suggested that democracy precedes the increase in urban informality. However, it is inconclusive whether democracy precedes the increases in the formal urban labor share or reduction the rural labor share. These results somewhat support the hypothesis of democracy-driven structural transformation, the impact of which on economic inequality will be assessed in the qualitative analysis.

Table 4.5: ARDL Coefficients - Labor Share decomposition

Dem Var	Dependent Variable		
	Rural	Infor Urb	Formal Urb
Poly	-0.019*	0.028**	0.091***
Liberal	-0.032***	0.047***	0.100***
Delib	-0.022**	0.034**	0.097***

Obs: Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. The full specification is presented at Appendix C.

Table 4.6: Granger-non-causality test

Hypotheses	χ^2 Tests	d.f	CV 10%
POLI non-cause SH_RURAL	2,049	2	4,605
SH_RURAL non-cause POLI	2,238	2	4,605
POLI non-cause SH_URBINF	7.724*	2	4,605
SH_URBINF non-cause POLI	4,278	2	4,605
POLI non-cause SH_URBFOR	0,099	2	4,605
SH_URBFOR non-cause POLI	2,327	2	4,605
LIBERAL non-cause SH_RURAL	2,049	2	4,605
SH_RURAL non-cause LIBERAL	2,238	2	4,605
LIBERAL non-cause SH_URBINF	7.079*	2	4,605
SH_URBINF non-cause LIBERAL	3,028	2	4,605
LIBERAL non-cause SH_URBFOR	1,254	2	4,605
SH_URBFOR non-cause LIBERAL	2,088	2	4,605
DELIB non-cause SH_RURAL	1,455	2	4,605
SH_RURAL non-cause DELIB	2,757	2	4,605
DELIB non-cause SH_URBINF	5.396*	2	4,605
SH_URBINF non-cause DELIB	2,030	2	4,605
DELIB non-cause SH_URBFOR	1,085	2	4,605
SH_URBFOR non-cause DELIB	1,482	2	4,605

Obs: (*) denotes significance if compared to the critical value.

4.4 Qualitative Institutional Historical Analysis

This section focuses on the congruence analysis of Argentine institutional history to investigate the political and economic factors that could explain the increase in personal income inequality and the decrease in functional income inequality resulting from democratization. The analysis aims to address two key aspects. First, it seeks to determine whether it is democracy or dictatorships that can explain the observed effects on personal inequality and labor share. This analysis will involve a counterfactual assessment. Second, the study will evaluate the validity of claims regarding the typical characteristics of Argentine democratic regimes that directly account for these distributional effects. The hypotheses to be examined in this context align with the concepts presented in “Democracy, Redistribution and Inequality” by ACEMOGLU *et al.* [144], namely: 1) Director’s Law, 2) opening range of opportunity, 3) democracy-induced structural transformation, and 4) elite captured democracy.

4.4.1 First democratic episode: Antecedents and first universal suffrage regime (1914-1930)

Argentina declared its independence in 1810, but it achieved full sovereignty after a 15-year war of independence against royalist forces loyal to Spain. Internal conflicts persisted until 1853 when the country adopted a constitution that established a presidential republic with a bicameral congress, a system that remained in place through subsequent constitutions. During the 19th century, elections for presidents and congress members were conducted using non-secret, manipulated, and undemocratic suffrage methods. Under this electoral framework, the ruling party at the time, Partido Autonomista Nacional, secured victory in all presidential elections until 1916 through poll manipulation, which led to growing social discontent.

In 1890, amidst severe economic crises, a movement called Unión Cívica emerged from the Argentine urban middle class [174]. This movement actively opposed the existing electoral system and sparked a wave of social unrest. Following violent state repression, a dissident faction of the Unión Cívica party led by Hipólito Yrigoyen, known as Unión Cívica Radical, pressured the ruling elites through protests in 1895 and 1903 to enact electoral reforms aimed at ensuring institutional stability. In 1910, Roque Saenz Peña assumed the presidency and initiated the reform process, which culminated in the establishment of the secret ballot and universal suffrage for men in 1912.

In the first presidential election after the ‘Saenz Peña law’, Hipólito Yrigoyen was elected in 1916, and the Unión Cívica Radical dominated Argentine politics from 1916 until 1930. Distributive conflicts did not motivate the political instability that led to the military coup of 1930 [175]. Although income inequality had decreased during this pe-

riod, and real wages had risen, there was no reversal in the trend after the coup. Moreover, the return on agricultural capital and the stock market index remained high. The reason indicated by the authors was the political polarization of resistance to institutional capture.

The labor organization in the 1920s was highly stratified (see RAPOPORT [176]): at the top were the workers in the public sector, who were the primary focus of social policies; below them were the qualified private workers, who faced economic instabilities but received some improvements; and then there were the unqualified workers, who received little assistance. The formation of labor unions was primarily driven by qualified workers who were not involved in politics. This position dissatisfied anarchists (who advocated for labor improvement for all workers) and communists (who focused on political actions).

When the Unión Cívica Radical assumed power, its supporters implemented measures to exclude political opposition, such as patronage. Party bosses of the Radical party expanded a clientelist system by offering jobs in factories and the public sector in exchange for votes and party loyalty. The region of Buenos Aires benefited the most from this policy due to its political subordination to the federal government [177]. Alongside job offerings, the provision of social services also increased during this period in a clientelist manner. Furthermore, Yrigoyen implemented labor market reforms, including the introduction of a minimum wage, Sunday day-offs, union centralization, collective contracts, and paid leave, which primarily benefited urban workers. Other measures included federal intervention in provinces controlled by conservative politicians, university reforms influenced by conservatives, and violent repression against union strikes, such as the Tragic Week in 1921.

Despite these efforts, there was notable resistance to Hipólito Yrigoyen both within and outside the government. In addition to conservative dissatisfaction, there was a faction within the Unión Cívica Radical known as the Grupo Azul, which consisted of more aristocratic groups within the party. This anti-personalista strain of the party advocated for the ideals of radicalism without aligning themselves with the figure of Yrigoyen.

As a strategic move, Yrigoyen chose the aristocratic Marcelo Torcuato de Avelar as his successor, who was later elected in 1922. His government marked the establishment of further social policies. Examples of these policies include the controversial pension system implemented in 1923 and the reversal of some previous measures, such as the university reform. However, political polarization persisted, and the management of public debt posed a real challenge to the government's political stability [178].

This situation led to Yrigoyen's reelection in 1928. Despite his popularity among the middle class, the political struggle intensified. The 1929 crisis severely affected the country, and Yrigoyen's inadequate crisis management triggered conservative reactions and social pressure. In 1930, a military coup led by José Félix Uriburu overthrew Yrigoyen, and Uriburu began to reinstate an oligarchic government in the country.

Overall, the social policies implemented during the Yrigoyen era can provide evi-

dence of the functioning of the traditional mechanism proposed by Meltzer and Richard: democracy provided electoral incentives for the lower classes. However, it is evident that Yrigoyen's focus on his electoral base in the urban middle class, the use of patronage to secure votes, and the lack of economic sustainability undermined the improvements in income distribution during his government.

4.4.2 Second democratic episode: the fall of the “Infame Period” and the rise of Peronism (1943-1955)

The period following the 1930 coup represented, in some ways, a return to the political model of the 19th century, with an agrarian elite-led government maintained through electoral frauds [179]. There were no efforts by the judiciary to establish checks and balances, as the Supreme Court supported the coup [180], which undermined the institutional perspective of political rights. The economic effects of the 1929 crisis impacted both workers and elites. During this period, the Confederación General del Trabajo (CGT) was established, and the trade unions were influenced by the socialists, while the presence of anarchists in the labor movement diminished [176]. In the external sector, Argentina's main partner, Great Britain, responded to the crisis by implementing protectionist measures that favored its former colonies. This further harmed the Argentine exporting sector. However, these measures were later reversed through the Roca-Runciman agreement, which facilitated economic recovery, industrialization, and the expansion of exports, as well as increased European demand during World War II. Argentina adopted a neutral stance during the war due to the pro-Axis sentiments within essential sectors of the military. However, for the civilian government, the country's economic interests relied on its relationship with Britain. This ambiguity in Argentina's position during the war contributed to social dissatisfaction, fueled by electoral fraud and the reversal of social policies, ultimately leading to a military coup in 1943.

This coup replaced the oligarchic system with a military junta, and among the rulers, the Secretary of Labor, Juan Domingo Perón, emerged as the most notable figure advocating for the working class. Despite the initial repression of the CGT and the labor movement following the coup, Perón sought to establish closer ties with the trade unions by granting them legal recognition, allowing parallel unions to weaken political opposition, and suppressing the influence of the communists [176]. Due to Perón's popularity and dissatisfaction within the Armed Forces, Perón was forced to resign and was detained. However, amidst massive social protests in Buenos Aires, he was released from prison in 1945. The Partido Justicialista, Perón's party, “emerged in the 1940s from a coalition of urban workers in the most developed areas of the country and local bosses in the most rural provinces” [181]. Subsequently, Perón won the first free presidential election held after the 1943 coup, securing his presidency in 1946. However, the populist policies of

the Peronist era created institutional fragility, which was exemplified during the “Infamous period” when Peronists, once in power, impeached four out of five Supreme Court justices under the pretext of “matters concerning the people’s interest” [180].

Favored by the reconstruction of the international economy and trade following World War II, the Perón government implemented industrial and social policies that primarily benefited the urban population at the expense of rural workers. “Until the early 1950s, the government pursued an extensive redistributive policy that laid the foundation for the welfare state and the development of a strong middle class, which characterized the country by the end of the 1960s. This period remains vivid in the collective memory as the clearest expression of Peronism’s economic policies” [179]. Noteworthy policies implemented during this time included raising the minimum wage, implementing price controls, providing industrial protection, promoting import substitution and export policies, offering credit subsidies, providing social assistance, and implementing progressive taxation. Regarding the latter policy, the top marginal tax rate increased from 12% in 1942 to 25% in 1943, 27% in 1946, 32% in 1952, and 40% in 1955. Trade unions experienced their maximum expansion and centralization, enjoying a legal monopoly in each industrial sector. However, it is important to note that the overall labor force decreased during this period [176].

The rapid expansion of fiscal spending resulted in a balance of payment crisis and high inflation (31% CPI and -12% in terms of trade) that struck Argentina in 1949 [182]. This crisis compelled the Peronist government to scale back the growth of the public sector [179]. In 1951, Perón was reelected amid accusations of electoral corruption and repression of the opposition [147]. Another recession hit Argentina, prompting Perón to further reduce the expansion of social policies and introduce incentives for agriculture to stimulate the country’s primary export sector and generate foreign reserves [179]. The economic downturn and increasing cost of living during this period fueled waves of protests among organized labor, students, the Catholic Church, and dissident military factions, which were met with state repression. In September 1955, a military coup brought an end to Perón’s government.

In summary, while the recovery from the economic depression of the 1930s maintained income distribution levels during the “Infame Period,” the Juan Perón era introduced significant measures that temporarily improved economic equality. However, Perón’s focus on the middle class, specifically the emerging urban workers and rural elites, was evident. Additionally, Perón represented the peak of the structural transformation process. Despite efforts to industrialize Argentina, these measures alone did not address economic inequality. Ultimately, Perón faced a similar fate as Yrigoyen: embracing unsustainable fiscal policies resulted in the reversal of economic equality and the downfall of his government.

4.4.3 Third Democratic Episode: the succession of the so-called “Revolución Libertadora” and the de-Perónized democracy

The 1955 coup installed General Lonardi as the short-lived president, lasting only three months due to a lack of support from the military. General Aramburu succeeded Lonardi and pursued de-Peronization policies. These policies included labor union reforms to counter monopolies and the implementation of an economic plan developed by Raúl Prebisch. The plan involved denationalization of enterprises, deregulation of economic sectors and external trade, and the removal of price controls, subsidies, and multiple exchange rates [178]. Aramburu aimed to establish a temporary regime with a democratic transition that excluded the Peronists from participating in elections, which generated social resistance from labor unions.

The social consequence of this period was a noticeable decline in the labor share [176]. Subsequent weak civilian governments, under the influence of the military, replaced Aramburu’s administration [147]. During this period, none of the social sectors—industrialists, agricultural landlords, and organized labor—were strong enough to dominate the others [179]. Arturo Frondizi emerged as a candidate and won the elections in 1958 after internal disputes within the Unión Cívica Radical.

Initially, Frondizi adopted a conciliatory approach and implemented pro-union policies such as price freezes and significant wage increases of up to 60% [178]. He also pursued industrial policies and engaged in international negotiations for oil exploration in Argentina. However, growing dissatisfaction among industrial and agricultural producers, coupled with a severe balance of payments crisis, led to a shift in policy. In late 1958, Frondizi announced negotiations with the IMF and a stabilization plan that included higher interest rates, debt control, the removal of price controls, a reversal of reduced work hours in the public sector, and a devaluation of the exchange rate. These measures resulted in a severe recession (-5% GDP in 1959) accompanied by high inflation (a 133% increase in the wholesale price index). The crisis eroded labor support for the government (amplified by allegations of a secret pact with Juan Perón) and increased pressure from the military as an influential interest group [178].

From 1959 to 1961, Frondizi pursued developmentalist policies focused on import substitution, modernization, and attracting foreign investment. An unstable coalition between industrialists and unions implemented stop-and-go import substitution policies [183]. However, excessive reliance on foreign investment led to another balance of payments crisis in 1961, triggering protests from labor unions and a decline in military support due to foreign policy decisions and the legalization of the Peronist movement [178].

In 1962, Frondizi was overthrown by the military, and a transitional junta led by Juan María Guido, the former president of the Senate, assumed power. Frondizi’s erratic economic policies resulted in a severe recession that struck Argentina shortly after his re-

moval, with a per capita GDP decline of -8.6% between 1962 and 1963. However, the Guido government implemented a stabilization plan and benefited from the rising value of Argentine commodities in international trade, leading to a rapid economic recovery [178].

In 1963, limited presidential elections were held, excluding Frondizi and the Peronists, and Arturo Illia became the new president. Illia, representing the Yrigoyenist tradition, advocated for the termination of international contracts related to oil extraction, price controls, and a 30% wage increase. However, as the economic boom reached its end, these measures resulted in higher inflation, exacerbated by exchange rate devaluation to promote exports and a new balance of payments crisis caused by increased imports for industrial accumulation [178].

“Despite the increase in consumption, the Illia program satisfied only a few people outside the traditional electoral base of the middle-class radicalistas, who greatly benefited from the expansion of public expenditure and public employment” [178]. The dissatisfaction of industrial and agricultural producers, as well as workers, continued to accumulate, leading to the victory of the Peronists in the congressional elections. The boycott of the executive government by the congress, combined with a new recession in 1966, created an unstable scenario that eventually resulted in another coup, bringing General Juan Carlos Onganía to power.

In general, the inconsistent plans implemented to address the fiscal issues inherited from the Perón government worsened the conditions of the workers. The Frondizi government continued with urbanization and industrialization policies. However, the conflict between organized labor and economic elites hindered economic stabilization efforts. The Illia government also implemented policies that primarily benefited the middle class, which can be seen as evidence of the Director’s law.

4.4.4 Fourth democratic episode: the end of Onganía regime and the short return of Peronism (1973-1976)

Despite the centralization efforts and the increasing economic growth (0.6% in GNP in 1966, 2.7% in 1967, 4.3% in 1968, 8.5% in 1969, and 5.4% in 1970) [184], there were indications of wage compression [176]. The regime of General Onganía faced social resistance from both white-collar and blue-collar workers, students, and the urban poor [147, 178]. This tension led to the emergence of revolutionary armed groups from both the left and right, fueled by different factions within the Peronist movement. The escalation of social conflicts ultimately led to the downfall of Onganía in 1970, followed by a transition to democracy under the leadership of General Levingston and General Lanusse, and the brief presidencies of the Peronists Héctor Campora and Raúl Lastrini (head of the Chamber of Representatives). In 1973, Juan Perón won the first free election held in the

1970s and began his third term.

Between 1973 and 1976, the Peronist regimes were characterized by the conflict between the right-wing and left-wing factions within the Justicialista Party [184]. Campora aligned with the left, while Lastrini favored the right, and Perón himself maintained an ambiguous stance, trying to find a middle ground. In 1973, the economy experienced high growth of 6.1% in the first quarter and an unemployment rate of 6.1% in greater Buenos Aires, but it also suffered from high inflation of 64.2% in the previous year. The Ministry of Economy implemented an economic control plan with a “general agreement” among different economic sectors, involving price freezes and general wage increases. However, after a year and a half, shortages of products and trade imbalances began to emerge [184]. Perón passed away in July 1974, and his vice-president and wife, Isabel Perón, assumed the presidency. A new right-wing economic cabinet proposed gradual economic reforms, but the problems continued to accumulate. In June 1975, Argentina faced a severe balance of payments crisis. Inflation skyrocketed (monthly CPI variation of 34.9% in July), real wages declined (the real wages index dropped from 118.6 in January to 86.6 in December), and the economy entered into a recession (-6.3% of output in the last quarter). The economic crisis led to the emergence of a new left-wing political and economic cabinet within Isabel Perón’s government during her temporary absence. This cabinet pursued more gradual demand-oriented policies to mitigate the rise in unemployment. However, when Isabel Perón returned, a centrist faction emerged and attempted to implement stricter adjustment policies. Unfortunately, their efforts were interrupted by a military coup in March 1976 [184].

The Onganía government witnessed wage compression, which generated significant social pressure. According to STURZENEGGER [184], the second Peronist era exemplified an unstable populist government, where price controls and fiscal expansion contributed to one of the most severe economic crises in Argentine history, negatively impacting income distribution and ultimately leading to another military coup.

4.4.5 Fifth democratic episode: the end of the military junta and the rise of the contemporary liberal democracy (1982-1999)

The military coup of 1976 initiated the most authoritarian regime Argentina witnessed in the 20th century [147]. Under the government of General Jorge Videla, Argentina experienced a ruthless police state, with tens of thousands of people forcibly disappeared, tortured, imprisoned without trial, or forced into exile. The regime also pursued a policy of “desperonización” (de-Peronization) of the economy, which involved the repeal of labor laws, the initiation of trade liberalization, and the weakening of labor unions. The combination of political repression and unpopular economic measures resulted in wage compression and escalating social protests, which undermined the military government’s

authority [176].

Videla was succeeded by General Roberto Viola in 1981, and later that same year, General Leopoldo Galtieri assumed power. In an attempt to gain political support during an economic crisis, Argentina declared war against the United Kingdom in 1982, seeking to reclaim sovereignty over the Falkland Islands, known as the Malvinas in Argentina. However, the rapid defeat led to the surrender of the Argentine army and worsened the economic crisis (with a GDP decline of approximately 5% in 1981 and 1982, and an inflation rate of 162% in 1982) [179]. General Galtieri resigned shortly after the surrender, and democratic elections were called for in 1983. The electoral system established by the exiting military rulers in 1983 for the Lower House Representatives is characterized by a majoritarian bias that favors winning parties in less-populated provinces, and this arrangement has persisted since then [181]. In the presidential election, the radical candidate Raúl Alfonsín was declared the winner.

The Alfonsín era marked an exemplary transition to democracy, where “full liberal and democratic mechanisms are in place; nevertheless, the idea that social tensions and conflicts may find an escape valve through coercive interference with those mechanisms has not completely vanished from people’s minds” [185]. The subsequent democratization of Argentina was not the result of a social agreement but rather the collapse of the military government. Moreover, the previous regime incorrectly assumed that the electoral victor would come from their own support base.

Instead, Raúl Alfonsín posed a challenge to the corporate power that existed both during the military regime and prior to it [185]. According to Carlos NINO [185], Alfonsín sought to align the role of the military institution with democratic principles by revoking privileges acquired under military regimes and disassociating from past populist governments. Measures taken included the repeal of amnesty laws for human rights violations committed during the military regime, the transfer of jurisdiction for military crimes to civilian courts, dismissals of high-ranking officials, reassignment of important officials outside Buenos Aires, and the civilian control of the military-industrial complex. While a majority of the military showed some willingness to exercise self-restraint, these measures created political tension between the army and the government.

There were also conflicts between the government and civil society [185]. The Catholic Church resisted the repeal of “immoral” censorship and reforms in family law. Certain sectors of the media, which had flourished during the military regime, opposed anti-media monopoly laws and the right to respond to false or offensive reports. President Alfonsín gained popularity by taking a stance against trade unions, whom he denounced as allies of the military in supporting a Peronist president. Despite initial efforts at reconciliation [176], organized labor engaged in numerous general and localized strikes against regulatory proposals and the establishment of public health insurance, which they perceived as undermining the healthcare system managed by the unions (albeit with biases). The

business sector pressured the government to maintain privileges and launched campaigns against higher and progressive taxation levels as part of fiscal adjustments to control inflation. Additionally, they opposed compulsory saving plans and the partial retention of export earnings.

The clash between pressure groups undermines the principles of economic stabilization during moments of external debt crisis and lack of investment: “increasing levels of inflation are fueled by fierce competition among economic agents vying for a larger share of a diminishing pie” [185]. Alfonsín inherited a country whose economic condition was widely recognized as deplorable and, in some ways, catastrophic, with a recession in the productive sector, high unemployment, and declining real wages [178]. After a decade of rapid accumulation of external debt driven by financial sector development, Argentina faced a severe capital flight due to a reversal of monetary policies in developed countries, which posed challenges for debt management. In 1985, amid a 7.6% decline in output and inflation of 672% [179], Alfonsín introduced the “Austral plan,” which involved wage and price freezes, control of money supply, and the introduction of a new currency, the Austral.

Despite its short-term success, the plan faced opposition from organized labor and the entrepreneurial sector since 1986. While the former group demanded wage increases, the latter expressed dissatisfaction with price freezes, the sharp decline in export prices, the increase in external debt, and the lack of coordination from the central bank, which aimed to expand credit to stimulate the economy [182]. Fiscal adjustments such as privatizations, tax hikes, and government expenditure cuts were proposed and supported by IMF and World Bank programs, but these proposals were dismissed by the congress. In 1989, the cessation of IMF assistance and the depletion of foreign reserves forced Alfonsín to sharply devalue the currency against the dollar, leading to a recession with high inflation that eventually turned into hyperinflation (GDP growth went from -2.6% in 1988 to -7.5% in 1989 and -2.4% in 1990; annual inflation rate rose from 343% in 1988 to 3080% in 1989 and 2314% in 1990) [179].

In this chaotic scenario, the presidential elections resulted in victory for the Justicialist candidate Carlos Menem. During the electoral period, Menem exacerbated the severe economic crisis [186]. Despite his decision to implement a liberal plan once elected, Menem exploited the fact that when he adopted radical electoral rhetoric, it deteriorated the economic conditions and the expectations of creditors, thereby reducing the popularity of Alfonsín and boosting his own popularity.

At the beginning of his presidency, Carlos Menem devised stabilization plans that encompassed privatizations, deregulation, the end of price freezes, tax hikes, and lower tariffs. However, a second episode of hyperinflation occurred. In 1989, the BonEx Plan was implemented, which involved the confiscation of deposits and their conversion into long-term dollar bonds. Although this measure managed to control inflation, it had a

severe recessionary impact and proved to be unsustainable. These actions undermined Menem's efforts to gain support from Peronist trade unions [176].

Nevertheless, Argentina signed the Brady Plan for debt restructuring with the United States, providing Menem with the opportunity to launch a new economic stabilization program. In 1991, Economy Minister Domingo Cavallo introduced the convertibility plan, which restored the Peso's value by pegging it to the US dollar through a currency board. This plan was accompanied by trade and financial liberalization, a high rate of indebtedness, modernizing investments, capital accumulation, and privatization [179]. Furthermore, Cavallo implemented individual capitalization pension systems, labor market deregulation (weakening unions, non-binding minimum wages, and reduced unemployment protection), and modest yet increasing social cash transfers. As a result, inflation came under control (falling from 172% in 1991 to 25% in 1992 and below 10% in subsequent years) [179], and the country experienced a period of significant economic growth, albeit accompanied by higher inequality.

The final years of the 1990s were characterized by multiple external crises [179]. Argentina experienced a severe recession (-2.8% in GDP) and a high unemployment rate of 17.4% in 1995 as a result of the Tequila crisis. The newly elected Mexican government had changed its exchange rate policy, allowing its currency to float, which triggered massive capital flight from other developing countries. Although Argentina's economic growth initially plummeted and then recovered, the unemployment and poverty rates remained high. This period also witnessed a notable increase in women's participation in the labor market (from 50.8% in 1994 to 53.3% in 1995) and secondary labor markets. However, there were no signs of improvement in social inequality, and existing social policies failed to adequately address the conditions of the unemployed [176]. Subsequent economic crises in the Asian Tigers (1997), Russia (1998), and Brazil (1999) further limited Argentina's access to external credit, exacerbating the country's economic instability.

The most recent democratization process in Argentina was marked by a prolonged struggle to implement economic stabilization policies. The dictatorships led by Videla, Viola, and Galtieri attempted to liberalize the economy through "De-Peronization" but instead plunged the country into a deeper social and economic crisis, fueled by social protests and the Falklands War. Furthermore, the dictators shaped the electoral system, which increased political and regional inequality and fostered short-term incentives for politicians. The Alfonsín government faced even more severe distributive conflicts that undermined fiscal adjustments, and a shock to electoral confidence further aggravated the crisis and economic inequality. The Menem government, on the other hand, pursued liberal policies with greater success. However, Menem initially faced protests, and successive external shocks resulting from the exchange rate pegging undermined efforts to implement stronger social policies.

4.5 Quantitative Descriptive Data Analysis

We need to emphasize the importance of each period analyzed in the long-term relationship between democracy and inequality. Therefore, this section delves into the quantitative data and presents a comprehensive descriptive analysis of the primary data series.

Figure 4.1 illustrates the evolution of the Gini index and the labor share, both in conjunction with Argentina's democratic cycles represented by the leading indicator Pol-yarchy (POLY)⁴. The figure reveals a consistent decrease in personal income inequality during the Yrigoyen government, accompanied by a decline and subsequent recovery of the labor share. Thus, despite the initial shock in economic distribution and the reorganization of the patronage system, the overall period followed the expected trend described in the traditional literature: the first democratic period reduced personal and functional income inequality. However, a stabilization trend occurred in the "infamous period" following Yrigoyen's ousting.

After the military coup of 1943 and the rise of Juan Perón, a significant reduction in personal inequality was observed in the short term, followed by an unstable trend leading up to the so-called "Revolución Libertadora." Juan Perón implemented expansionist policies to capture the trade unions, which became strategic state political pressure groups, and gain popularity among urban workers. However, these policies proved fiscally unsustainable, undermining the continuity of his government. Nevertheless, the labor share remained at high levels until the coup, after which it experienced a substantial decline due to economic stabilization efforts.

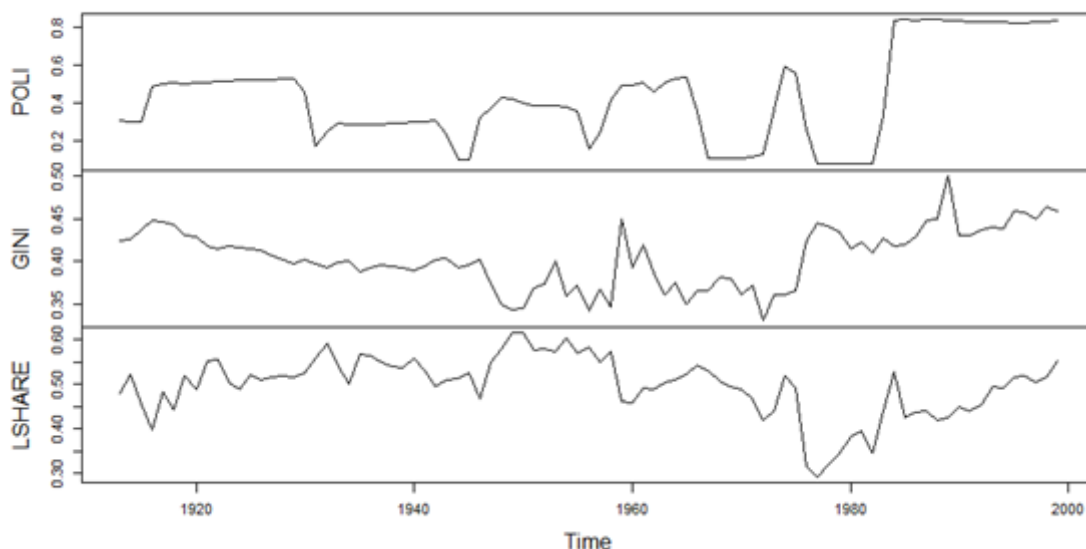
During the civilian regimes following the revolution, there was a substantial increase in inequality during the Frondizi government, followed by a rapid decline during the Illia government, accompanied by a consistent increase in the labor share throughout this period. However, a stagnant trend in the Gini index and a decrease in the labor share followed the military dictatorships of Generals Onganía, Levingston, and Lanusse. Wage compression during this period, as mentioned in the literature [176], appears to have been less severe than in other regimes, according to the graph analysis.

During the short-lived democratic return of Juan Perón, the labor share increased, and the Gini index did not change significantly. The most pronounced increase in personal inequality and decrease in labor share occurred immediately after Isabelita Perón's government, which was marked by a severe economic crisis resulting from her economic policies. Contrary to what the literature suggests [176], the graph indicates that wage compression during the General Videla and Galtieri dictatorship did not significantly impact income distribution but rather maintained very high levels of personal inequality and reduced the labor share.

In the period that witnessed the highest scores in democracy, following the Alfonsín

⁴Similar results are obtained when using other indicators.

Figure 4.1: Evolution of Gini and Labor Share compared to democratic cycles (Polyarchy)



and Menem governments, the adoption of liberalizing policies and fiscal adjustment efforts fueled distributive conflicts, recessionary periods, and wage dispersion. While these factors led to a gradual recovery of the labor share, they also resulted in personal inequality reaching its highest levels in the series studied.

4.6 Discussion

The analysis of Argentina's institutional history suggests the unstable and asymmetric nature of Argentine democracy. There is little evidence to support the notion that dictatorial periods in Argentina had an equalizing effect. On the contrary, most regimes implemented policies that either maintained previous levels of income inequality and labor share or further deteriorated income equality. The exception was the regimes of Generals Onganía, Levingston, and Lanusse, which modestly compressed wages compared to the opposite effect observed during democratic periods. This limited support for our counterfactual hypothesis indicates that the quantitative results imply the increase in income inequality and labor share is driven by the democratic periods rather than a hypothetical dictatorial phase that decreases labor share and personal inequality. The democratic regimes that primarily contributed to the observed phenomenon were the later ones, such as the Second Perón era, Alfonsín, and Menem.

Regarding the strength of hypotheses explaining the notable factors of Argentine democracy that may account for the increase in inequality, the middle class emerges as a significant actor in shaping the political foundation of democracy. Both of the main

parties during this period relied on the support of the urban middle class. The movement for universal (male) suffrage and the formation of the Unión Cívica Radical, which was the first party to govern Argentina under this electoral system, were driven by the urban middle class [174]. Similarly, the Justicialista Party played a role in creating a “new” middle class among urban workers during the Perón era [179].

In both parties, patronage is recognized as a historical strategy employed to maintain an electoral base and political power [177, 187]. Since the 1980s, the Justicialista Party has witnessed a decline in the participation of labor unions in their party influence, leading to an increased reliance on patronage to attract middle-class voters and maintain popularity among workers [187]. Job offerings, particularly public sector jobs, have become a strategic bargaining tool used by local party bosses to secure votes. These jobs often come with higher wages compared to the average wage in the private sector [181]. Consequently, these policies seem to contribute to wage dispersion.

Furthermore, the electoral reform implemented in 1983 solidified the unequal treatment of voters for electoral purposes. The electoral structure favors local party leaders, creating a power balance reminiscent of the influence held by local elites during the caudillo era. This serves as evidence of democracy captured by the elite [144]. The reform, introduced by the ruling military regime at the time, tilted the electoral system in favor of winning parties in less populated provinces or provinces with smaller districts, such as the Buenos Aires Metropolitan Area [181]. The asymmetric treatment of provinces and the allocation of higher-income public employment based on political support provide evidence of the existence of what is known as Director’s law [148].

No evidence was found to suggest that the increase in inequality during the process of democratization was caused by structural change. Autocratic governments did not implement significant institutions of labor coercion in rural areas. Furthermore, industrial policies aimed at promoting structural change were implemented during the early democratic periods, which saw a reduction in both personal and functional inequality. However, changes in the labor market did have an impact on income distribution. The increased participation of secondary workers and women in the labor market contributed to the rise in labor share and wage dispersion, providing weak evidence of increased opportunities [144].

The management of crises was not exclusive to the Alfonsín administration [146]. As local leaders in provinces choose the candidates for the deputies’ chamber, they have an incentive to select weak politicians who will not compete for internal party power [188]. Consequently, elected deputies are unlikely to be reelected and have the incentive to approve short-term policies instead of engaging in long-term socio-economic planning. The decentralized political system also exacerbates patronage and increases the political power of small provinces, enabling them to resist economic adjustments proposed by the federal government [189]. Furthermore, the most formally democratic periods were

marked by severe economic crises with adverse distributional effects. These crises occurred at the end of the first Juan Perón government, during the management of Isabel Perón, Alfonsín, and Menem governments, often as a result of amplification of structural economic problems inherited from previous regimes (in the case of the latter two). The electoral design and confrontational social actors fueled distributive conflicts, which further worsened the economic crises in the later democratic periods. These conflicts can be observed in the pressures against economic adjustment policies and demands for wage increases in the electoral strategies of the Carlos Menem government against the Alfonsín administration. The crises that occurred during these periods disproportionately affected the unarticulated poor, while social policies did not effectively alleviate poverty. Thus, the intensification of distributive conflicts during Argentine democratic periods is a new factor highlighted in the congruence analysis.

4.7 Conclusion

Latin American democracies differ from the traditional trajectories observed in developed countries due to their propensity for social, economic, and political instability, which has led to a succession of autocratic, populist, and liberal regimes. This study examines the relationship between this type of democratic development and income inequality using the case of Argentina.

Argentina serves as a magnifying glass for factors that can also be observed in other Latin American countries. Similar to other South American nations, local rural landowners exerted significant influence on national politics, contributing to institutional inequality [190]. The existing literature on clientelism in the region emphasizes the prevalence of this system of benefits over universal or class-based designs [191]. This arrangement is fueled by factionalism, as observed in Argentina, Costa Rica, Honduras, and Venezuela. In these cases, groups of politicians compete for space within a few parties and employ patronage as a currency for votes and intra-party power [192]. Furthermore, despite being unsustainable, Latin American development plans were implemented, providing politicians with resources to attract votes [192]. The capture of trade unions, as witnessed during the Perón era, shifted the associations' objectives from improving contracts with employers to becoming part of state pressure groups, thereby exacerbating distributive conflicts. Similar capture is also seen in other populist governments, such as Vargas in Brazil and Gaitán in Colombia [193]. In Brazil, the unstable political scenario during the contemporary democratization process also resulted in elite capture and the implementation of a poorly designed Constitution that ambiguously favored higher incomes, despite the introduction of social policies [194].

The perpetuation of high levels of income inequality in Argentina throughout the twentieth century is considered a significant factor contributing to social instability and

the weakness of democratic governance [147]. Considering the unequal nature of Latin American democracy, as exemplified by Argentina, one can infer the existence of an unconsolidated and incomplete democracy [159].

Chapter 5

Final considerations

With the theoretical background outlined in the introductory chapter and the two investigative chapters, it was possible to evaluate from different perspectives the treatment of incentives by social agents regarding the specific problem of inequality of power. In the first investigation, the issue of harassment was addressed as an excessive exercise of power by the principal over the agent, allowing the boss to extract non-contractible benefits at the expense of the employee. In this case, legal frameworks were developed to reduce the inequality of power, aiming not only to mitigate the harm caused by harassment but also to unveil the inherent risks of the employment contract. In the subsequent investigation, the Chilean law enforcement apparatus was systematically employed to maintain power disparities vis-à-vis the rest of the population, thereby generating popular reactions shaped by collective experiences of state violence — leading to a greater inclination to protest and less willingness to seek electoral reforms. In the last exercise, among several economic factors, the Argentine legal design of their latest Constitution brings electoral incentives to fragile long-run economic planning and also incentives to redistribution to middle class provinces.

In this regard, the cases serve as cautionary tales illustrating how legal designs can be a double-edged sword: they can either diminish or perpetuate power imbalances. Consequently, the field of political economy continues to assist the tradition of law and economics by identifying instances of power asymmetry within legal systems and addressing collective action problems in order to either sustain or reduce these asymmetries (see ACEMOGLU *et al.* [9]).

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Appendix A

Content of Appendix A: Here are the complete proofs of the propositions showed in Chapter 1.

A.1 Canonical Moral Hazard model without Harassment

For a matter of comparison, we calculate the risk measure in a canonical moral hazard model without harassment.

The utility of the boss is:

$$U_P = \pi_1.[q(\bar{a}_p) - \bar{t}] + (1 - \pi_1).[q(\underline{a}_p) - \underline{t}] \quad (\text{A.1})$$

The utility of the female worker is:

$$U_A = \sqrt{t} - a_p \quad (\text{A.2})$$

For simplicity, a_p is not observable by the boss, but the result q is.

$$q = a_p + \theta \quad (\text{A.3})$$

, where θ is a state of nature variable.

a_i is observable by the boss.

Hence, the principal problem is:

$$Max_{t,\underline{t}} \pi_1.[\bar{q} - \bar{t}] + (1 - \pi_1).[q - \underline{t}] \quad (\text{A.4})$$

s.t.

$$\pi_1[\sqrt{\bar{t}} - \bar{a}_p] + (1 - \pi_1)[\sqrt{\underline{t}} - \bar{a}_p] \geq \pi_0[\sqrt{\bar{t}} - \underline{a}_p] + (1 - \pi_0)[\sqrt{\underline{t}} - \underline{a}_p] \quad (\text{A.5})$$

$$\pi_1[\sqrt{\bar{t}} - \bar{a}_p] + (1 - \pi_1)[\sqrt{\underline{t}} - \bar{a}_p] \geq 0 \quad (\text{A.6})$$

To help the optimization, let $u^2 = t$ (there is, the transfer is the inverse function of the agent's utility). The inequalities become equations, as the general case under principal risk neutrality. Therefore, the Principal's problem is:

$$\text{Max}_{\underline{u}, \bar{u}} \pi_1 \cdot [\bar{q} - \bar{u}^2] + (1 - \pi_1) \cdot [\underline{q} - \underline{u}^2] \quad (\text{A.7})$$

s.t.

$$\pi_1[\bar{u} - \bar{a}_p] + (1 - \pi_1)[\underline{u} - \bar{a}_p] = \pi_0[\bar{u} - \underline{a}_p] + (1 - \pi_0)[\underline{u} - \underline{a}_p] \quad (\text{A.8})$$

$$\pi_1[\bar{u} - \bar{a}_p] + (1 - \pi_1)[\underline{u} - \bar{a}_p] = 0 \quad (\text{A.9})$$

To compare the value of \bar{u} and \underline{u} , we fixed $\pi_1 = 0.5$ for tractability, and we consider $\underline{a}_p = 0$ and $\bar{a}_p = 1$.

With A.9:

$$\bar{u} = \frac{-(0.5)[\underline{u} - 1]}{0.5} + 1 \quad (\text{A.10})$$

$$\bar{u} = -\underline{u} + 1 + 1 \quad (\text{A.11})$$

$$\bar{u} = 2 - \underline{u} \quad (\text{A.12})$$

With A.8:

$$0.5[2 - \underline{u} - 1] + 0.5[\underline{u} - 1] = \pi_0[2 - \underline{u}] + (1 - \pi_0)[\underline{u}] \quad (\text{A.13})$$

$$0 = -\underline{u}.\pi_0 + (1 - \pi_0)\underline{u} - (1 - \pi_0) \quad (\text{A.14})$$

$$0 = 2 + (1 - 2\pi_0)\underline{u} \quad (\text{A.15})$$

$$\underline{u} = 0 \quad (\text{A.16})$$

Substituting A.16 in A.12:

$$\bar{u} = 2 - 0 \quad (\text{A.17})$$

$$\bar{u} = 2 \quad (\text{A.18})$$

The risk measure in the canonical model, therefore is A.18 minus A.16:

$$\bar{u} - \underline{u} = 2 - 0 \quad (\text{A.19})$$

$$\bar{u} - \underline{u} = 2 \quad (\text{A.20})$$

A.2 First best contract under Harassment

Also for comparison, we calculate the metrics of harassment and risk in the first best contract where the compatibility restriction does not exist.

A.2.1 The problem

The utility of the boss is:

$$U_P = \pi_1 \cdot [q(\bar{a}_p) + a_i - \bar{t}] + (1 - \pi_1) \cdot [q(\underline{a}_p) + a_i - \underline{t}] \quad (\text{A.21})$$

The utility of the female worker is:

$$U_A = \sqrt{\bar{t}} - a_p \cdot a_i \quad (\text{A.22})$$

In the first best case, the efforts are observable and enforceable.

Hence, the principal problem is:

$$Max_{\bar{t}, \underline{t}, a_i} \pi_1 \cdot [\bar{q} + a_i - \bar{t}] + (1 - \pi_1) \cdot [\underline{q} + a_i - \underline{t}] \quad (\text{A.23})$$

s.t.

$$\pi_1 [\sqrt{\bar{t}} - \bar{a}_p \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \underline{a}_p \cdot a_i] \geq 0 \quad (\text{A.24})$$

A.2.2 Optimization - the value of improper activity a_i

Considering the simplifications used in the other models, the principal problem is:

$$Max_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} + a_i - \bar{u}^2] + 0.5[\underline{q} + a_i - \underline{u}^2] \quad (\text{A.25})$$

s.t.

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = 0 \quad (\text{A.26})$$

We isolate the values of \underline{u} in the restriction to insert in the Principal's function.

Using A.26):

$$0.5\bar{u} - a_i + 0.5\underline{u} = 0 \quad (\text{A.27})$$

$$0.5\underline{u} = -0.5\bar{u} + a_i \quad (\text{A.28})$$

$$\underline{u} = -\bar{u} + 2a_i \quad (\text{A.29})$$

Now, the Principal's problem can be written as

$$\text{Max}_{\bar{u}, a_i} 0.5[\bar{q} + a_i - \bar{u}^2] + 0.5[\underline{q} + a_i - (-\bar{u} + 2a_i)^2] \quad (\text{A.30})$$

The first FOCs is:

$$-\bar{u} - 0.5 * 2 * (-\bar{u} + 2a_i) * -1 = 0 \quad (\text{A.31})$$

$$-2\bar{u} + 2a_i = 0 \quad (\text{A.32})$$

$$\bar{u} = a_i \quad (\text{A.33})$$

The second FOC is:

$$0.5 + 0.5 - 0.5 * 2 * (-\bar{u} + 2a_i) * 2 = 0 \quad (\text{A.34})$$

$$1 + 2\bar{u} - 4a_i = 0 \quad (\text{A.35})$$

Inserting A.33 in A.35:

$$1 + 2a_i - 4a_i = 0 \tag{A.36}$$

$$1 - 2a_i = 0 \tag{A.37}$$

$$a_i = \frac{1}{2} \tag{A.38}$$

A.3 Moral Hazard under Harassment

This is the step-by-step solution of the main model proposed in this article.

A.3.1 The problem

The utility of the boss is:

$$U_P = \pi_1 \cdot [q(\overline{a_p}) + a_i - \bar{t}] + (1 - \pi_1) \cdot [q(\underline{a_p}) + a_i - \underline{t}] \quad (\text{A.39})$$

The utility of the female worker is:

$$U_A = \sqrt{t} - a_p \cdot a_i \quad (\text{A.40})$$

For simplicity, a_p is not observable by the boss, but the result q is.

$$q = a_p + \theta \quad (\text{A.41})$$

, where θ is a state of nature variable.

a_i is observable by the boss.

Hence, the principal problem is:

$$Max_{\bar{t}, \underline{t}, a_i} \pi_1 \cdot [\bar{q} + a_i - \bar{t}] + (1 - \pi_1) \cdot [\underline{q} + a_i - \underline{t}] \quad (\text{A.42})$$

s.t.

$$\pi_1 [\sqrt{\bar{t}} - \overline{a_p} \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \overline{a_p} \cdot a_i] \geq \pi_0 [\sqrt{\bar{t}} - \underline{a_p} \cdot a_i] + (1 - \pi_0) [\sqrt{\underline{t}} - \underline{a_p} \cdot a_i] \quad (\text{A.43})$$

$$\pi_1 [\sqrt{\bar{t}} - \overline{a_p} \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \overline{a_p} \cdot a_i] \geq 0 \quad (\text{A.44})$$

A.3.2 Optimization - the value of improper activity a_i

Considering the simplifications used in the other models, the principal problem is:

$$Max_{\underline{u}, \underline{u}, a_i} 0.5[\bar{q} + a_i - \bar{u}^2] + 0.5[\underline{q} + a_i - \underline{u}^2] \quad (\text{A.45})$$

s.t.

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = \pi_0 \bar{u} + (1 - \pi_0) \underline{u} \quad (\text{A.46})$$

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = 0 \quad (\text{A.47})$$

We isolate the values of \bar{u} and \underline{u} in the restrictions to insert in the Principal's function.
Using A.47:

$$0.5\bar{u} - a_i + 0.5\underline{u} = 0 \quad (\text{A.48})$$

$$0.5\underline{u} = -0.5\bar{u} + a_i \quad (\text{A.49})$$

$$\underline{u} = -\bar{u} + 2a_i \quad (\text{A.50})$$

Inserting A.50 in A.46

$$0.5[\bar{u} - a_i] + 0.5[-\bar{u} + 2a_i - a_i] = \pi_0 \bar{u} + (1 - \pi_0)[- \bar{u} + 2a_i] \quad (\text{A.51})$$

$$0 = \pi_0 \bar{u} + (1 - \pi_0)[- \bar{u} + 2a_i] \quad (\text{A.52})$$

$$(1 - \pi_0)\bar{u} - \pi_0 \bar{u} = +(1 - \pi_0)2a_i \quad (\text{A.53})$$

$$(1 - 2\pi_0)\bar{u} = (1 - \pi_0)2a_i \quad (\text{A.54})$$

$$\bar{u} = \frac{(2 + 2\pi_0)a_i}{(1 - 2\pi_0)} \quad (\text{A.55})$$

$$\bar{u} = \frac{a_i + (1 + 2\pi_0)a_i}{(1 - 2\pi_0)} \quad (\text{A.56})$$

$$\bar{u} = a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.57})$$

Inserting A.57 in A.50

$$\underline{u} = -a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] + 2a_i \quad (\text{A.58})$$

$$\underline{u} = a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.59})$$

Now, we can insert A.57 and A.59 in A.45 to make the optimization

$$\text{Max}_{a_i} 0.5 \left[\bar{q} + a_i - \left(a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \right)^2 \right] + 0.5 \left[\underline{q} + a_i - \left(a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \right)^2 \right] \quad (\text{A.60})$$

The FOC is:

$$0.5 \left[1 + a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \right] * \left[1 + \frac{1}{(1 - 2\pi_0)} \right] + 0.5 \left[1 + a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \right] * \left[1 - \frac{1}{(1 - 2\pi_0)} \right] = 0 \quad (\text{A.61})$$

$$-2 \left(a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \right) * \left[1 + \frac{1}{(1 - 2\pi_0)} \right] + a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] * \left[1 - \frac{1}{(1 - 2\pi_0)} \right] = -2 \quad (\text{A.62})$$

$$\left(a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \right) * \left[1 + \frac{1}{(1 - 2\pi_0)} \right] + \left(a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \right) * \left[1 - \frac{1}{(1 - 2\pi_0)} \right] = 1 \quad (\text{A.63})$$

$$a_i \left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + a_i \left[1 - \frac{1}{(1-2\pi_0)} \right]^2 = 1 \quad (\text{A.64})$$

$$a_i \left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + a_i \left[1 - \frac{1}{(1-2\pi_0)} \right]^2 = 1 \quad (\text{A.65})$$

$$a_i = \frac{1}{\left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1-2\pi_0)} \right]^2} \quad (\text{A.66})$$

A.3.3 Assessing the Risk Measure under harassment

The risk measure is assessed by calculating $\bar{u} - \underline{u}$ in A.57 and A.59 and incorporating A.66

$$\bar{u} - \underline{u} = 0 + a_i + a_i * \frac{1}{(1-2\pi_0)} - a_i + a_i * \frac{1}{(1-2\pi_0)} \quad (\text{A.67})$$

$$\bar{u} - \underline{u} = a_i * \frac{2}{(1-2\pi_0)} \quad (\text{A.68})$$

See ??

$$\bar{u} - \underline{u} = \frac{1}{\left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1-2\pi_0)} \right]^2} * \frac{2}{(1-2\pi_0)} \quad (\text{A.69})$$

A.4 First best under Harassment and Punitive Justice

Reminder: punitive justice is understood in this article as the case where a court of justice can verify and neutralize the boss' benefit of the harassment only, with a probability $(1 - \beta)$.

A.4.1 The problem

The utility of the boss is:

$$U_P = \pi_1 \cdot [q(\bar{a}_p) + a_i - \bar{t}] + (1 - \pi_1) \cdot [q(\underline{a}_p) + (1 - \beta)a_i - \underline{t}] \quad (\text{A.70})$$

The utility of the female worker is:

$$U_A = \sqrt{\bar{t}} - a_p \cdot a_i \quad (\text{A.71})$$

In the first best case, the efforts are observable and enforceable.

Hence, the principal problem is:

$$\text{Max}_{\bar{t}, \underline{t}, a_i} \pi_1 \cdot [\bar{q} + a_i - \bar{t}] + (1 - \pi_1) \cdot [\underline{q} + (1 - \beta)a_i - \underline{t}] \quad (\text{A.72})$$

s.t.

$$\pi_1 [\sqrt{\bar{t}} - \bar{a}_p \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \underline{a}_p \cdot a_i] \geq 0 \quad (\text{A.73})$$

A.4.2 Optimization - the value of improper activity a_i

Considering the simplifications used in the other models, the principal problem is:

$$\text{Max}_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} + (1 - \beta)a_i - \bar{u}^2] + 0.5[\underline{q} + (1 - \beta)a_i - \underline{u}^2] \quad (\text{A.74})$$

s.t.

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = 0 \quad (\text{A.75})$$

We isolate the values of \underline{u} in the restriction to insert in the Principal's function.

Using A.75 :

$$0.5\bar{u} - a_i + 0.5\underline{u} = 0 \quad (\text{A.76})$$

$$0.5\underline{u} = -0.5\bar{u} + a_i \quad (\text{A.77})$$

$$\underline{u} = -\bar{u} + 2a_i \quad (\text{A.78})$$

Now, the Principal's problem can be written as

$$\text{Max}_{\bar{u}, a_i} 0.5[\bar{q} + (1 - \beta)a_i - \bar{u}^2] + 0.5[\underline{q} + (1 - \beta)a_i - (-\bar{u} + 2a_i)^2] \quad (\text{A.79})$$

The first FOCs is:

$$-\bar{u} - 0.5 * 2 * (-\bar{u} + 2a_i) * -1 = 0 \quad (\text{A.80})$$

$$-2\bar{u} + 2a_i = 0 \quad (\text{A.81})$$

$$\bar{u} = a_i \quad (\text{A.82})$$

The second FOC is:

$$0.5(1 - \beta) + 0.5(1 - \beta) - 0.5 * 2 * (-\bar{u} + 2a_i) * 2 = 0 \quad (\text{A.83})$$

$$(1 - \beta) + 2\bar{u} - 4a_i = 0 \quad (\text{A.84})$$

Inserting A.82 in A.84 :

$$(1 - \beta) + 2a_i - 4a_i = 0 \tag{A.85}$$

$$(1 - \beta) - 2a_i = 0 \tag{A.86}$$

$$a_i = \frac{(1 - \beta)}{2} \tag{A.87}$$

A.5 Moral Hazard under Harassment and Punitive Justice

Reminder: punitive justice is understood in this article as the case where a court of justice can verify and neutralize the boss' benefit of the harassment only, with a probability $(1 - \beta)$.

A.5.1 The problem

The utility of the boss is:

$$U_P = \pi_1 \cdot [q(\bar{a}_p) + (1 - \beta)a_i - \bar{t}] + (1 - \pi_1) \cdot [q(\underline{a}_p) + (1 - \beta)a_i - \underline{t}] \quad (\text{A.88})$$

The utility of the female worker is:

$$U_A = \sqrt{t} - a_p \cdot a_i \quad (\text{A.89})$$

For simplicity, a_p is not observable by the boss, but the result q is.

$$q = a_p + \theta \quad (\text{A.90})$$

, where θ is a state of nature variable.

a_i is observable by the boss.

Hence, the principal problem is:

$$\text{Max}_{\bar{t}, \underline{t}, a_i} \pi_1 \cdot [\bar{q} + (1 - \beta)a_i - \bar{t}] + (1 - \pi_1) \cdot [\underline{q} + (1 - \beta)a_i - \underline{t}] \quad (\text{A.91})$$

s.t.

$$\pi_1 [\sqrt{\bar{t}} - \bar{a}_p \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \bar{a}_p \cdot a_i] \geq \pi_0 [\sqrt{\bar{t}} - \underline{a}_p \cdot a_i] + (1 - \pi_0) [\sqrt{\underline{t}} - \underline{a}_p \cdot a_i] \quad (\text{A.92})$$

$$\pi_1 [\sqrt{\bar{t}} - \bar{a}_p \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \bar{a}_p \cdot a_i] \geq 0 \quad (\text{A.93})$$

A.5.2 Optimization - the value of improper activity a_i

Considering the simplifications used in the other models, the principal problem is:

$$Max_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} + (1 - \beta)a_i - \bar{u}^2] + 0.5[\underline{q} + (1 - \beta)a_i - \underline{u}^2] \quad (\text{A.94})$$

s.t.

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = \pi_0\bar{u} + (1 - \pi_0)\underline{u} \quad (\text{A.95})$$

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = 0 \quad (\text{A.96})$$

We isolate the values of \bar{u} and \underline{u} in the restrictions to insert in the Principal's function.
Using A.96 :

$$0.5\bar{u} - a_i + 0.5\underline{u} = 0 \quad (\text{A.97})$$

$$0.5\underline{u} = -0.5\bar{u} + a_i \quad (\text{A.98})$$

$$\underline{u} = -\bar{u} + 2a_i \quad (\text{A.99})$$

Inserting A.99 in A.95

$$0.5[\bar{u} - a_i] + 0.5[-\bar{u} + 2a_i - a_i] = \pi_0\bar{u} + (1 - \pi_0)[- \bar{u} + 2a_i] \quad (\text{A.100})$$

$$0 = \pi_0\bar{u} + (1 - \pi_0)[- \bar{u} + 2a_i] \quad (\text{A.101})$$

$$(1 - \pi_0)\bar{u} - \pi_0\bar{u} = (1 - \pi_0)2a_i \quad (\text{A.102})$$

$$(1 - 2\pi_0)\bar{u} = (1 - \pi_0)2a_i \quad (\text{A.103})$$

$$\bar{u} = \frac{(2 - 2\pi_0)a_i}{(1 - 2\pi_0)} \quad (\text{A.104})$$

$$\bar{u} = \frac{(1 - 2\pi_0)[+a_i] + a_i}{(1 - 2\pi_0)} \quad (\text{A.105})$$

$$\bar{u} = a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.106})$$

Inserting A.106 in A.99

$$\underline{u} = -a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] + 2a_i \quad (\text{A.107})$$

$$\underline{u} = +a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.108})$$

Now, we can insert A.108 and A.106 in A.94 to make the optimization

$$\text{Max}_{a_i} 0.5[\bar{q} + (1 - \beta)a_i - (a_i[1 + \frac{1}{(1 - 2\pi_0)}])^2] + 0.5[\underline{q} + (1 - \beta)a_i - (a_i[1 - \frac{1}{(1 - 2\pi_0)}])^2] \quad (\text{A.109})$$

The FOC is:

$$0.5[(1 - \beta) - 2(a_i[1 + \frac{1}{(1 - 2\pi_0)}]) * [1 + \frac{1}{(1 - 2\pi_0)}]] + 0.5[(1 - \beta) - 2(a_i[1 - \frac{1}{(1 - 2\pi_0)}]) * [1 - \frac{1}{(1 - 2\pi_0)}]] = 0 \quad (\text{A.110})$$

$$-2(a_i[1 + \frac{1}{(1 - 2\pi_0)}]) * [1 + \frac{1}{(1 - 2\pi_0)}] - 2(a_i[1 - \frac{1}{(1 - 2\pi_0)}]) * [1 - \frac{1}{(1 - 2\pi_0)}] = -2 + 2\beta \quad (\text{A.111})$$

$$(a_i[1 + \frac{1}{(1 - 2\pi_0)}]) * [1 + \frac{1}{(1 - 2\pi_0)}] + (a_i[1 - \frac{1}{(1 - 2\pi_0)}]) * [1 - \frac{1}{(1 - 2\pi_0)}] = 1 - \beta \quad (\text{A.112})$$

$$a_i \left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + a_i \left[1 - \frac{1}{(1-2\pi_0)} \right]^2 = 1 - \beta \quad (\text{A.113})$$

$$a_i \left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + a_i \left[1 - \frac{1}{(1-2\pi_0)} \right]^2 = 1 - \beta \quad (\text{A.114})$$

$$a_i = \frac{1 - \beta}{\left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1-2\pi_0)} \right]^2} \quad (\text{A.115})$$

A.5.3 Assessing the Risk Measure under harassment

The risk measure is assessed by calculating $\bar{u} - \underline{u}$ in A.106 and A.108 and incorporating A.115:

$$\bar{u} - \underline{u} = 0 + a_i + a_i * \frac{1}{(1-2\pi_0)} - a_i + a_i * \frac{1}{(1-2\pi_0)} \quad (\text{A.116})$$

$$\bar{u} - \underline{u} = a_i * \frac{2}{(1-2\pi_0)} \quad (\text{A.117})$$

See ??

$$\bar{u} - \underline{u} = \frac{1 - \beta}{\left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1-2\pi_0)} \right]^2} * \frac{2}{(1-2\pi_0)} \quad (\text{A.118})$$

When setting $\bar{u} - \underline{u}$ to zero, it easy to show that we can have zero risk, there is, first best risk when:

$$1 - \beta = 0 \quad (\text{A.119})$$

A.6 First best under Harassment and Restorative Justice

Reminder: restorative justice is understood in this article as the case where a court of justice can verify and neutralize both the boss' benefit and the agent's cost of the harassment, with a probability $(1 - \beta)$.

A.6.1 The Problem

$$Max_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} + (1 - \beta)a_i - \bar{u}^2] + 0.5[\underline{q} + (1 - \beta)a_i - \underline{u}^2] \quad (\text{A.120})$$

s.t.

$$0.5[\bar{u} - (1 - \beta)a_i] + 0.5[\underline{u} - (1 - \beta)a_i] = 0 \quad (\text{A.121})$$

We isolate the values of \underline{u} in the restriction to insert in the Principal's function.

Using A.121 :

$$0.5\bar{u} - (1 - \beta)a_i + 0.5\underline{u} = 0 \quad (\text{A.122})$$

$$0.5\underline{u} = -0.5\bar{u} + (1 - \beta)a_i \quad (\text{A.123})$$

$$\underline{u} = -\bar{u} + 2(1 - \beta)a_i \quad (\text{A.124})$$

Now, the Principal's problem can be written as

$$Max_{\bar{u}, a_i} 0.5[\bar{q} + (1 - \beta)a_i - \bar{u}^2] + 0.5[\underline{q} + (1 - \beta)a_i - (-\bar{u} + 2(1 - \beta)a_i)^2] \quad (\text{A.125})$$

The first FOCs is:

$$-\bar{u} - 0.5 * 2 * (-\bar{u} + 2(1 - \beta)a_i) * -1 = 0 \quad (\text{A.126})$$

$$-2\bar{u} + 2(1 - \beta)a_i = 0 \quad (\text{A.127})$$

$$\bar{u} = 0 + (1 - \beta)a_i \quad (\text{A.128})$$

The second FOC is:

$$0.5(1 - \beta) + 0.5(1 - \beta) - 0.5 * 2 * (-\bar{u} + 2(1 - \beta)a_i) * 2 * (1 - \beta) = 0 \quad (\text{A.129})$$

$$1 + 2\bar{u} - 4(1 - \beta)a_i = 0 \quad (\text{A.130})$$

Inserting A.130 in A.128 :

$$1 + 2(1 - \beta)a_i - 4(1 - \beta)a_i = 0 \quad (\text{A.131})$$

$$1 - 2(1 - \beta)a_i = 0 \quad (\text{A.132})$$

$$a_i = \frac{1}{2(1 - \beta)} \quad (\text{A.133})$$

A.7 Moral Hazard under Harassment and Restorative Justice

Reminder: restorative justice is understood in this article as the case where a court of justice can verify and neutralize both the boss' benefit and the agent's cost of the harassment, with a probability $(1 - \beta)$.

When there is restorative justice, the principal problem is:

$$Max_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} + (1 - \beta)a_i - \bar{u}^2] + 0.5[\underline{q} + (1 - \beta)a_i - \underline{u}^2] \quad (\text{A.134})$$

s.t.

$$0.5[\bar{u} - (1 - \beta)a_i] + 0.5[\underline{u} - (1 - \beta)a_i] = \pi_0\bar{u} + (1 - \pi_0)\underline{u} \quad (\text{A.135})$$

$$0.5[\bar{u} - (1 - \beta)a_i] + 0.5[\underline{u} - (1 - \beta)a_i] = 0 \quad (\text{A.136})$$

We isolate the values of \bar{u} and \underline{u} in the restrictions to insert in the Principal's function. Using A.136 :

$$0.5\bar{u} - (1 - \beta)a_i + 0.5\underline{u} = 0 \quad (\text{A.137})$$

$$0.5\underline{u} = -0.5\bar{u} + (1 - \beta)a_i \quad (\text{A.138})$$

$$\underline{u} = -\bar{u} + 2(1 - \beta)a_i \quad (\text{A.139})$$

Inserting A.139 in A.135

$$0.5[\bar{u} - (1 - \beta)a_i] + 0.5[-\bar{u} + 2(1 - \beta)a_i - (1 - \beta)a_i] = \pi_0\bar{u} + (1 - \pi_0)[- \bar{u} + 2(1 - \beta)a_i] \quad (\text{A.140})$$

$$0 = \pi_0\bar{u} + (1 - \pi_0)[- \bar{u} + 2(1 - \beta)a_i] \quad (\text{A.141})$$

$$(1 - \pi_0)\bar{u} - \pi_0\bar{u} = (1 - \pi_0)2(1 - \beta)a_i \quad (\text{A.142})$$

$$(1 - 2\pi_0)\bar{u} = (1 - \pi_0)2(1 - \beta)a_i \quad (\text{A.143})$$

$$\bar{u} = \frac{(2 - 2\pi_0)[(1 - \beta)a_i]}{(1 - 2\pi_0)} \quad (\text{A.144})$$

$$\bar{u} = \frac{(1 - 2\pi_0)[(1 - \beta)a_i] + (1 - \beta)a_i}{(1 - 2\pi_0)} \quad (\text{A.145})$$

$$\bar{u} = (1 - \beta)a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.146})$$

Inserting A.146 in A.139

$$\underline{u} = -(1 - \beta)a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] + 2(1 - \beta)a_i \quad (\text{A.147})$$

$$\underline{u} = (1 - \beta)a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.148})$$

Now, we can insert A.146 and A.148 in A.134 to make the optimization

$$\begin{aligned} & \text{Max}_{a_i} 0.5[\bar{q} + (1 - \beta)a_i - ((1 - \beta)a_i[1 + \frac{1}{(1 - 2\pi_0)}])^2] \\ & + 0.5[\underline{q} + (1 - \beta)a_i - ((1 - \beta)a_i[1 - \frac{1}{(1 - 2\pi_0)}])^2] \end{aligned} \quad (\text{A.149})$$

The FOC is:

$$\begin{aligned} & 0.5[(1 - \beta) - 2((1 - \beta)a_i[1 + \frac{1}{(1 - 2\pi_0)}]) * (1 - \beta)[1 + \frac{1}{(1 - 2\pi_0)}]] + 0.5[(1 - \beta) - \\ & 2((1 - \beta)a_i[1 - \frac{1}{(1 - 2\pi_0)}]) * (1 - \beta)[1 - \frac{1}{(1 - 2\pi_0)}]] = 0 \end{aligned} \quad (\text{A.150})$$

$$-2((1 - \beta)a_i[1 + \frac{1}{(1-2\pi_0)}]) * (1 - \beta)[1 + \frac{1}{(1-2\pi_0)}] - \frac{1}{(1-2\pi_0)} * (1 - \beta)[1 - \frac{1}{(1-2\pi_0)}] = -2 + 2\beta \quad (\text{A.151})$$

$$(a_i[1 + \frac{1}{(1-2\pi_0)}]) * [1 + \frac{1}{(1-2\pi_0)}] + (a_i[1 - \frac{1}{(1-2\pi_0)}]) * [1 - \frac{1}{(1-2\pi_0)}] = 1 \quad (\text{A.152})$$

$$(1 - \beta)a_i[1 + \frac{1}{(1-2\pi_0)}]^2 + (1 - \beta)a_i[1 - \frac{1}{(1-2\pi_0)}]^2 = 1 \quad (\text{A.153})$$

$$(1 - \beta)a_i[1 + \frac{1}{(1-2\pi_0)}]^2 + (1 - \beta)a_i[1 - \frac{1}{(1-2\pi_0)}]^2 = 1 \quad (\text{A.154})$$

$$a_i = \frac{1}{(1 - \beta)} \frac{1}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} \quad (\text{A.155})$$

The net level of harassment after justice is:

$$(1 - \beta)a_i = \frac{1}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} \quad (\text{A.156})$$

Which is the same as 2.14.

A.7.1 Assessing the Risk Measure under harassment

The risk measure is assessed by calculating $\bar{u} - \underline{u}$ in A.146 and A.148 and incorporating A.155

$$\bar{u} - \underline{u} = 0 + (1 - \beta)a_i + (1 - \beta)a_i * \frac{1}{(1 - 2\pi_0)} - (1 - \beta)a_i + (1 - \beta)a_i * \frac{1}{(1 - 2\pi_0)} \quad (\text{A.157})$$

$$\bar{u} - \underline{u} = (1 - \beta)a_i * \frac{2}{(1 - 2\pi_0)} \quad (\text{A.158})$$

See ??

$$\bar{u} - \underline{u} = \frac{1}{\left[1 + \frac{1}{(1-2\pi_0)}\right]^2 + \left[1 - \frac{1}{(1-2\pi_0)}\right]^2} * \frac{2}{(1-2\pi_0)} \quad (\text{A.159})$$

A.8 First best contract under Harassment (Risk averse principal)

In the following sections, the principal is risk averse with relation to his gains with improper activities (and punishment). These follow a concave function $g(a_i)$, there is, where $g'(a_i) > 0$ and $g''(a_i) < 0$. The principal is still risk neutral in gains with proper activities.

The problem

The utility of the boss is:

$$U_P = \pi_1 \cdot [q(\bar{a}_p) + g(a_i) - \bar{t}] + (1 - \pi_1) \cdot [q(\underline{a}_p) + g(a_i) - \underline{t}] \quad (\text{A.160})$$

The utility of the female worker is:

$$U_A = \sqrt{t} - a_p \cdot a_i \quad (\text{A.161})$$

In the first best case, the efforts are observable and enforceable.

Hence, the principal problem is:

$$\text{Max}_{\bar{t}, \underline{t}, a_i} \pi_1 \cdot [\bar{q} + g(a_i) - \bar{t}] + (1 - \pi_1) \cdot [\underline{q} + g(a_i) - \underline{t}] \quad (\text{A.162})$$

s.t.

$$\pi_1 [\sqrt{\bar{t}} - \bar{a}_p \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \underline{a}_p \cdot a_i] \geq U_r \quad (\text{A.163})$$

Optimization - the value of improper activity a_i

The simplifications still follow the precedent models.

Considering these simplifications, the principal problem is:

$$\text{Max}_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} + g(a_i) - \bar{u}^2] + 0.5[\underline{q} + g(a_i) - \underline{u}^2] \quad (\text{A.164})$$

s.t.

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = 0 \quad (\text{A.165})$$

We isolate the values of \underline{u} in the restriction to insert in the Principal's function.

Using A.165:

$$0.5\bar{u} - a_i + 0.5\underline{u} = 0 \quad (\text{A.166})$$

$$0.5\underline{u} = -0.5\bar{u} + a_i \quad (\text{A.167})$$

$$\underline{u} = -\bar{u} + 2a_i \quad (\text{A.168})$$

Now, the Principal's problem can be written as

$$\text{Max}_{\bar{u}, a_i} 0.5[\bar{q} + g(a_i) - \bar{u}^2] + 0.5[\underline{q} + g(a_i) - (-\bar{u} + 2a_i)^2] \quad (\text{A.169})$$

The first FOCs is:

$$\bar{u} - 0.5 * 2 * (-\bar{u} + 2a_i) * -1 = 0 \quad (\text{A.170})$$

$$-2\bar{u} + 2a_i = 0 \quad (\text{A.171})$$

$$\bar{u} = a_i \quad (\text{A.172})$$

The second FOC is:

$$0.5 * g'(a_i) + 0.5 * g'(a_i) - 0.5 * 2 * (-\bar{u} + 2a_i) * 2 = 0 \quad (\text{A.173})$$

$$g'(a_i) + 2\bar{u} - 4a_i = 0 \quad (\text{A.174})$$

Inserting A.172 in A.174:

$$g'(a_i) + 2a_i - 4a_i = 0 \quad (\text{A.175})$$

$$g'(a_i) - 2a_i = 0 \quad (\text{A.176})$$

$$a_i = \frac{g'(a_i)}{2} \quad (\text{A.177})$$

A.9 Moral Hazard under Harassment (Risk Averse Principal)

A.9.1 The Problem

The utility of the boss is:

$$U_P = \pi_1 \cdot [q(\bar{a}_p) + g(a_i) - \bar{t}] + (1 - \pi_1) \cdot [q(\underline{a}_p) + g(a_i) - \underline{t}] \quad (\text{A.178})$$

The utility of the female worker is:

$$U_A = \sqrt{t} - a_p \cdot a_i \quad (\text{A.179})$$

For simplicity, a_p is not observable by the boss, but the result q is.

$$q = a_p + \theta \quad (\text{A.180})$$

, where θ is a state of nature variable.

a_i is observable by the boss.

Hence, the principal problem is:

$$\text{Max}_{\bar{t}, \underline{t}, a_i} \pi_1 \cdot [\bar{q} + g(a_i) - \bar{t}] + (1 - \pi_1) \cdot [\underline{q} + g(a_i) - \underline{t}] \quad (\text{A.181})$$

s.t.

$$\pi_1 [\sqrt{\bar{t}} - \bar{a}_p \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \bar{a}_p \cdot a_i] \geq \pi_0 [\sqrt{\bar{t}} - \underline{a}_p \cdot a_i] + (1 - \pi_0) [\sqrt{\underline{t}} - \underline{a}_p \cdot a_i] \quad (\text{A.182})$$

$$\pi_1 [\sqrt{\bar{t}} - \bar{a}_p \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \bar{a}_p \cdot a_i] \geq U_r \quad (\text{A.183})$$

A.9.2 Optimization - the value of improper activity a_i

By applying the simplifications, the principal problem is:

$$Max_{\underline{u}, \underline{a}_i} 0.5[\bar{q} + g(a_i) - \bar{u}^2] + 0.5[\underline{q} + g(a_i) - \underline{u}^2] \quad (\text{A.184})$$

s.t.

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = \pi_0 \bar{u} + (1 - \pi_0) \underline{u} \quad (\text{A.185})$$

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = 0 \quad (\text{A.186})$$

We isolate the values of \bar{u} and \underline{u} in the restrictions to insert in the Principal's function.
Using A.186:

$$0.5\bar{u} - a_i + 0.5\underline{u} = 0 \quad (\text{A.187})$$

$$0.5\underline{u} = -0.5\bar{u} + a_i \quad (\text{A.188})$$

$$\underline{u} = -\bar{u} + 2a_i \quad (\text{A.189})$$

Inserting A.189 in A.185

$$0.5[\bar{u} - a_i] + 0.5[-\bar{u} + 2a_i - a_i] = \pi_0 \bar{u} + (1 - \pi_0)[- \bar{u} + 2a_i] \quad (\text{A.190})$$

$$0 = \pi_0 \bar{u} + (1 - \pi_0)[- \bar{u} + 2a_i] \quad (\text{A.191})$$

$$(1 - \pi_0)\bar{u} - \pi_0 \bar{u} = (1 - \pi_0) + (1 - \pi_0)2a_i \quad (\text{A.192})$$

$$(1 - 2\pi_0)\bar{u} = (1 - \pi_0) + (1 - \pi_0)2a_i \quad (\text{A.193})$$

$$\bar{u} = \frac{(2 - 2\pi_0)[a_i]}{(1 - 2\pi_0)} \quad (\text{A.194})$$

$$\bar{u} = \frac{(1 - 2\pi_0)[a_i] + a_i}{(1 - 2\pi_0)} \quad (\text{A.195})$$

$$\bar{u} = a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.196})$$

Inserting A.196 in A.189

$$\underline{u} = -a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] + 2a_i \quad (\text{A.197})$$

$$\underline{u} = a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.198})$$

Now, we can insert A.196 and A.198 in A.184 to make the optimization

$$\text{Max}_{a_i} 0.5 \left[\bar{q} + a_i - (g(a_i) \left[1 + \frac{1}{(1 - 2\pi_0)} \right]) \right]^2 + 0.5 \left[\underline{q} + g(a_i) - (a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right]) \right]^2 \quad (\text{A.199})$$

The FOC is:

$$0.5 [g'(a_i) - 2(a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right]) * \left[1 + \frac{1}{(1 - 2\pi_0)} \right]] + 0.5 [g'(a_i) + a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right]) * \left[1 - \frac{1}{(1 - 2\pi_0)} \right]] = 0 \quad (\text{A.200})$$

$$-2(a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right]) * \left[1 + \frac{1}{(1 - 2\pi_0)} \right] + a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right]) * \left[1 - \frac{1}{(1 - 2\pi_0)} \right] = -2 * g'(a_i) \quad (\text{A.201})$$

$$(+a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right]) * \left[1 + \frac{1}{(1 - 2\pi_0)} \right] + (+a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right]) * \left[1 - \frac{1}{(1 - 2\pi_0)} \right] = g'(a_i) \quad (\text{A.202})$$

$$a_i \left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + a_i \left[1 - \frac{1}{(1-2\pi_0)} \right]^2 = g'(a_i) \quad (\text{A.203})$$

$$a_i \left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + a_i \left[1 - \frac{1}{(1-2\pi_0)} \right]^2 = g'(a_i) \quad (\text{A.204})$$

$$a_i = \frac{g'(a_i)}{\left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1-2\pi_0)} \right]^2} \quad (\text{A.205})$$

A.9.3 Assessing the Risk Measure under harassment

The risk measure is assessed by calculating $\bar{u} - \underline{u}$ in A.198 and A.196 and incorporating A.205

$$\bar{u} - \underline{u} = a_i + a_i * \frac{1}{(1-2\pi_0)} - a_i + a_i * \frac{1}{(1-2\pi_0)} \quad (\text{A.206})$$

$$\bar{u} - \underline{u} = a_i * \frac{2}{(1-2\pi_0)} \quad (\text{A.207})$$

$$\bar{u} - \underline{u} = \frac{g'(a_i)}{\left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1-2\pi_0)} \right]^2} * \frac{2}{(1-2\pi_0)} \quad (\text{A.208})$$

A.10 First Best under Harassment and Punitive Justice (Risk Averse Principal)

A.10.1 The Problem

The utility of the boss is:

$$U_P = \pi_1 \cdot [q(\bar{a}_p) + (1 - \beta) * g(a_i) - \bar{t}] + (1 - \pi_1) \cdot [q(\underline{a}_p) + (1 - \beta) * g(a_i) - \underline{t}] \quad (\text{A.209})$$

The utility of the female worker is:

$$U_A = \sqrt{\bar{t}} - a_p \cdot a_i \quad (\text{A.210})$$

In the first best case, the efforts are observable and enforceable.

Hence, the principal problem is:

$$\text{Max}_{\bar{t}, \underline{t}, a_i} \pi_1 \cdot [\bar{q} + (1 - \beta) * g(a_i) - \bar{t}] + (1 - \pi_1) \cdot [\underline{q} + (1 - \beta) * g(a_i) - \underline{t}] \quad (\text{A.211})$$

s.t.

$$\pi_1 [\sqrt{\bar{t}} - \bar{a}_p \cdot a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \underline{a}_p \cdot a_i] \geq 0 \quad (\text{A.212})$$

A.10.2 Optimization - the value of improper activity a_i

Considering the simplifications used in the other models, the principal problem is:

$$\text{Max}_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} - \bar{u}^2] + 0.5[\underline{q} - \underline{u}^2] + (1 - \beta)g(a_i) \quad (\text{A.213})$$

s.t.

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = 0 \quad (\text{A.214})$$

We isolate the values of \underline{u} in the restriction to insert in the Principal's function.

Using A.214:

$$0.5\bar{u} - a_i + 0.5\underline{u} = 0 \quad (\text{A.215})$$

$$0.5\underline{u} = -0.5\bar{u} + a_i \quad (\text{A.216})$$

$$\underline{u} = -\bar{u} + 2a_i \quad (\text{A.217})$$

Now, the Principal's problem can be written as

$$\text{Max}_{\bar{u}, a_i} 0.5[\bar{q} - \bar{u}^2] + 0.5[\underline{q} - (-\bar{u} + 2a_i)^2] + (1 - \beta)g(a_i) \quad (\text{A.218})$$

The first FOCs is:

$$-\bar{u} - 0.5 * 2 * (-\bar{u} + 2a_i) * -1 = 0 \quad (\text{A.219})$$

$$-2\bar{u} + 2a_i = 0 \quad (\text{A.220})$$

$$\bar{u} = a_i \quad (\text{A.221})$$

The second FOC is:

$$(1 - \beta)g'(a_i) - 0.5 * 2 * (-\bar{u} + 2a_i) * 2 = 0 \quad (\text{A.222})$$

$$(1 - \beta)g'(a_i) + 2\bar{u} - 4a_i = 0 \quad (\text{A.223})$$

Inserting A.221 in A.223 :

$$(1 - \beta)g'(a_i) + 2a_i - 4a_i = 0 \quad (\text{A.224})$$

$$(1 - \beta)g'(a_i) - 2a_i = 0 \quad (\text{A.225})$$

$$a_i = \frac{(1 - \beta)g'(a_i)}{2} \quad (\text{A.226})$$

To have the variation of a_i wrt β , we isolate A.226 and uses implicit function theorem:

$$a_i - \frac{(1 - \beta)g'(a_i)}{2} = 0 \quad (\text{A.227})$$

$$\frac{\partial a_i}{\partial \beta} = \frac{\frac{g'(a_i)}{2}}{1 - \frac{(1-\beta)g''(a_i)}{2}} \quad (\text{A.228})$$

A.11 Moral Hazard under Harassment and Punitive Justice (Risk Averse Principal)

A.11.1 The problem

The utility of the boss is:

$$U_P = \pi_1 \cdot [q(\bar{a}_p) - \bar{t}] + (1 - \pi_1) \cdot [q(\underline{a}_p) - \underline{t}] + [(1 - \beta) * g(a_i) - \beta * 0] \quad (\text{A.229})$$

The utility of the female worker is:

$$U_A = \sqrt{t} - a_p \cdot a_i \quad (\text{A.230})$$

For simplicity, a_p is not observable by the boss, but the result q is.

$$q = a_p + \theta \quad (\text{A.231})$$

, where θ is a state of nature variable.

a_i is observable by the boss.

Hence, the principal problem is:

$$\text{Max}_{\bar{t}, \underline{t}, a_i} \pi_1 \cdot [\bar{q} - \bar{t}] + (1 - \pi_1) \cdot [\underline{q} - \underline{t}] + (1 - \beta)g(a_i) \quad (\text{A.232})$$

s.t.

$$\pi_1[\sqrt{\bar{t}} - \bar{a}_p \cdot a_i] + (1 - \pi_1)[\sqrt{\underline{t}} - \bar{a}_p \cdot a_i] \geq \pi_0[\sqrt{\bar{t}} - \underline{a}_p \cdot a_i] + (1 - \pi_0)[\sqrt{\underline{t}} - \underline{a}_p \cdot a_i] \quad (\text{A.233})$$

$$\pi_1[\sqrt{\bar{t}} - \bar{a}_p \cdot a_i] + (1 - \pi_1)[\sqrt{\underline{t}} - \bar{a}_p \cdot a_i] \geq U_r \quad (\text{A.234})$$

A.11.2 Optimization - the value of improper activity a_i

By making the simplifications, the principal problem is:

$$Max_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} - \bar{u}^2] + 0.5[\underline{q} - \underline{u}^2] + (1 - \beta)a_i \quad (\text{A.235})$$

s.t.

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = \pi_0\bar{u} + (1 - \pi_0)\underline{u} \quad (\text{A.236})$$

$$0.5[\bar{u} - a_i] + 0.5[\underline{u} - a_i] = 0 \quad (\text{A.237})$$

We isolate the values of \bar{u} and \underline{u} in the restrictions to insert in the Principal's function.
Using A.237 :

$$0.5\bar{u} - a_i + 0.5\underline{u} = 0 \quad (\text{A.238})$$

$$0.5\underline{u} = -0.5\bar{u} + a_i \quad (\text{A.239})$$

$$\underline{u} = -\bar{u} + 2a_i \quad (\text{A.240})$$

Inserting A.240 in A.236

$$0.5[\bar{u} - a_i] + 0.5[-\bar{u} + 2a_i - a_i] = \pi_0\bar{u} + (1 - \pi_0)[- \bar{u} + 2a_i] \quad (\text{A.241})$$

$$0 = \pi_0\bar{u} + (1 - \pi_0)[- \bar{u} + 2a_i] \quad (\text{A.242})$$

$$(1 - \pi_0)\bar{u} - \pi_0\bar{u} = (1 - \pi_0)2a_i \quad (\text{A.243})$$

$$(1 - 2\pi_0)\bar{u} = (1 - \pi_0)2a_i \quad (\text{A.244})$$

$$\bar{u} = \frac{(2 - 2\pi_0)[a_i]}{(1 - 2\pi_0)} \quad (\text{A.245})$$

$$\bar{u} = \frac{(1 - 2\pi_0)[a_i] + a_i}{(1 - 2\pi_0)} \quad (\text{A.246})$$

$$\bar{u} = a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.247})$$

Inserting A.247 in A.247

$$\underline{u} = -a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] + 2a_i \quad (\text{A.248})$$

$$\underline{u} = a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.249})$$

Now, we can insert A.247 and A.249 in A.235 to make the optimization

$$\text{Max}_{a_i} 0.5[\bar{q} - (a_i[1 + \frac{1}{(1-2\pi_0)}])]^2 + 0.5[\underline{q} - (a_i[1 - \frac{1}{(1-2\pi_0)}])]^2 + (1 - \beta) * g(a_i) \quad (\text{A.250})$$

The FOC is:

$$\begin{aligned} & 0.5[-2(a_i[1 + \frac{1}{(1-2\pi_0)}]) * [1 + \frac{1}{(1-2\pi_0)}]] + \\ & 0.5[(-2(U_r + a_i[1 - \frac{1}{(1-2\pi_0)})]) * [1 - \frac{1}{(1-2\pi_0)}]] + (1 - \beta)g'(a_i) = 0 \end{aligned} \quad (\text{A.251})$$

$$\begin{aligned} & -2(a_i[1 + \frac{1}{(1-2\pi_0)}]) * [1 + \frac{1}{(1-2\pi_0)}] - 2(a_i[1 - \frac{1}{(1-2\pi_0)}]) * [1 - \frac{1}{(1-2\pi_0)}] = \\ & -2 * +(1 - \beta) * g'(a_i) \end{aligned} \quad (\text{A.252})$$

$$(a_i[1 + \frac{1}{(1-2\pi_0)}]) * [1 + \frac{1}{(1-2\pi_0)}] + (a_i[1 - \frac{1}{(1-2\pi_0)}]) * [1 - \frac{1}{(1-2\pi_0)}] = (1 - \beta) * g'(a_i) \quad (\text{A.253})$$

$$a_i \left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + a_i \left[1 - \frac{1}{(1-2\pi_0)} \right]^2 = (1-\beta) * g'(a_i) \quad (\text{A.254})$$

$$a_i \left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + a_i \left[1 - \frac{1}{(1-2\pi_0)} \right]^2 = (1-\beta) * g'(a_i) \quad (\text{A.255})$$

$$a_i = \frac{(1-\beta) * g'(a_i)}{\left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1-2\pi_0)} \right]^2} \quad (\text{A.256})$$

To have the variation of a_i wrt β , we isolate A.256 and uses implicit function theorem:

$$a_i - \frac{(1-\beta) * g'(a_i)}{\left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1-2\pi_0)} \right]^2} = 0 \quad (\text{A.257})$$

$$\frac{\partial a_i}{\partial \beta} = - \frac{\frac{g'(a_i)}{\left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1-2\pi_0)} \right]^2}}{1 - \frac{(1-\beta) * g''(a_i)}{\left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1-2\pi_0)} \right]^2}} \quad (\text{A.258})$$

A.11.3 Assessing the Risk Measure under harassment

The risk measure is assessed by calculating $\bar{u} - \underline{u}$ in A.249 and A.247 and incorporating A.256

$$\bar{u} - \underline{u} = a_i + a_i * \frac{1}{(1-2\pi_0)} - a_i + a_i * \frac{1}{(1-2\pi_0)} \quad (\text{A.259})$$

$$\bar{u} - \underline{u} = a_i * \frac{2}{(1-2\pi_0)} \quad (\text{A.260})$$

$$\bar{u} - \underline{u} = \frac{(1-\beta) * g'(a_i)}{\left[1 + \frac{1}{(1-2\pi_0)} \right]^2 + \left[1 - \frac{1}{(1-2\pi_0)} \right]^2} * \frac{2}{(1-2\pi_0)} \quad (\text{A.261})$$

A.12 First Best under Harassment and Restorative Justice (Risk-Averse Principal)

A.12.1 The problem

The utility of the boss is:

$$U_P = \pi_1 \cdot [q(\bar{a}_p) + (1 - \beta)g(a_i) - \bar{t}] + (1 - \pi_1) \cdot [q(\underline{a}_p) + (1 - \beta)g(a_i) - \underline{t}] \quad (\text{A.262})$$

The utility of the female worker is:

$$U_A = \sqrt{t} - a_p \cdot (1 - \beta)a_i \quad (\text{A.263})$$

For simplicity, a_p is not observable by the boss, but the result q is.

$$q = a_p + \theta \quad (\text{A.264})$$

, where θ is a state of nature variable.

a_i is observable by the boss.

Hence, the principal problem is:

$$\text{Max}_{\bar{t}, \underline{t}, a_i} \pi_1 \cdot [\bar{q} + (1 - \beta)g(a_i) - \bar{t}] + (1 - \pi_1) \cdot [\underline{q} + (1 - \beta)g(a_i) - \underline{t}] \quad (\text{A.265})$$

s.t.

$$\pi_1 [\sqrt{\bar{t}} - \bar{a}_p \cdot (1 - \beta)a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \underline{a}_p \cdot (1 - \beta)a_i] \geq 0 \quad (\text{A.266})$$

A.12.2 Optimization - the value of improper activity a_i

Considering the simplifications used in the other models, the principal problem is:

$$\text{Max}_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} - \bar{u}^2] + 0.5[\underline{q} - \underline{u}^2] + (1 - \beta)g(a_i) \quad (\text{A.267})$$

s.t.

$$0.5[\bar{u} - (1 - \beta)a_i] + 0.5[\underline{u} - (1 - \beta)a_i] = 0 \quad (\text{A.268})$$

We isolate the values of \underline{u} in the restriction to insert in the Principal's function.

Using A.268 :

$$0.5\bar{u} - (1 - \beta)a_i + 0.5\underline{u} = 0 \quad (\text{A.269})$$

$$0.5\underline{u} = -0.5\bar{u} + (1 - \beta)a_i \quad (\text{A.270})$$

$$\underline{u} = -\bar{u} + 2(1 - \beta)a_i \quad (\text{A.271})$$

Now, the Principal's problem can be written as

$$Max_{\bar{u}, a_i} 0.5[\bar{q} - \bar{u}^2] + 0.5[\underline{q} - (-\bar{u} + 2(1 - \beta)a_i)^2] + (1 - \beta)g(a_i) \quad (\text{A.272})$$

The first FOCs is:

$$-\bar{u} - 0.5 * 2 * (-\bar{u} + 2(1 - \beta)a_i) * -1 = 0 \quad (\text{A.273})$$

$$-2\bar{u} + 2(1 - \beta)a_i = 0 \quad (\text{A.274})$$

$$\bar{u} = (1 - \beta)a_i \quad (\text{A.275})$$

The second FOC is:

$$(1 - \beta)g'(a_i) - 0.5 * 2 * (-\bar{u} + 2(1 - \beta)a_i) * 2 * (1 - \beta) = 0 \quad (\text{A.276})$$

$$g'(a_i) + 2\bar{u} - 4(1 - \beta)a_i = 0 \quad (\text{A.277})$$

Inserting A.275 in A.277 :

$$g'(a_i) + 2(1 - \beta)a_i - 4(1 - \beta)a_i = 0 \quad (\text{A.278})$$

$$g'(a_i) - 2(1 - \beta)a_i = 0 \quad (\text{A.279})$$

$$a_i = \frac{g'(a_i)}{2(1 - \beta)} \quad (\text{A.280})$$

To grasp the net level of improper activities considering justice:

$$(1 - \beta)a_i = \frac{g'(a_i)}{2} \quad (\text{A.281})$$

To have the variation of a_i wrt β , we isolate A.281 and uses implicit function theorem:

$$a_i - \frac{g'(a_i)}{2(1 - \beta)} = 0 \quad (\text{A.282})$$

$$\frac{\partial a_i}{\partial \beta} = \frac{\frac{g'(a_i)}{2(1-\beta)^2}}{1 - \frac{g''(a_i)}{2(1-\beta)}} \quad (\text{A.283})$$

To have the variation the net level of improper activities with relation to justice:

$$\frac{\partial(1 - \beta)a_i}{\partial \beta} = 0 \quad (\text{A.284})$$

A.13 Moral Hazard under Harassment and Restorative Justice (Risk-Averse Principal)

A.13.1 The problem

The utility of the boss is:

$$U_P = \pi_1 \cdot [q(\bar{a}_p) + (1 - \beta)g(a_i) - \bar{t}] + (1 - \pi_1) \cdot [q(\underline{a}_p) + (1 - \beta)g(a_i) - \underline{t}] \quad (\text{A.285})$$

The utility of the female worker is:

$$U_A = \sqrt{t} - a_p \cdot (1 - \beta)a_i \quad (\text{A.286})$$

For simplicity, a_p is not observable by the boss, but the result q is.

$$q = a_p + \theta \quad (\text{A.287})$$

, where θ is a state of nature variable.

a_i is observable by the boss.

Hence, the principal problem is:

$$\text{Max}_{\bar{t}, \underline{t}, a_i} \pi_1 \cdot [\bar{q} + (1 - \beta)g(a_i) - \bar{t}] + (1 - \pi_1) \cdot [\underline{q} + (1 - \beta)g(a_i) - \underline{t}] \quad (\text{A.288})$$

s.t.

$$\begin{aligned} \pi_1 [\sqrt{\bar{t}} - \bar{a}_p \cdot (1 - \beta)a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \bar{a}_p \cdot (1 - \beta)a_i] &\geq \\ \pi_0 [\sqrt{\bar{t}} - \underline{a}_p \cdot (1 - \beta)a_i] + (1 - \pi_0) [\sqrt{\underline{t}} - \underline{a}_p \cdot (1 - \beta)a_i] &\geq \end{aligned} \quad (\text{A.289})$$

$$\pi_1 [\sqrt{\bar{t}} - \bar{a}_p \cdot (1 - \beta)a_i] + (1 - \pi_1) [\sqrt{\underline{t}} - \bar{a}_p \cdot (1 - \beta)a_i] \geq 0 \quad (\text{A.290})$$

A.13.2 Optimization - the value of improper activity a_i

By applying the simplifications, the principal problem is:

$$Max_{\bar{u}, \underline{u}, a_i} 0.5[\bar{q} - \bar{u}^2] + 0.5[\underline{q} - \underline{u}^2] + (1 - \beta)g(a_i) \quad (\text{A.291})$$

s.t.

$$0.5[\bar{u} - (1 - \beta)a_i] + 0.5[\underline{u} - (1 - \beta)a_i] = \pi_0\bar{u} + (1 - \pi_0)\underline{u} \quad (\text{A.292})$$

$$0.5[\bar{u} - (1 - \beta)a_i] + 0.5[\underline{u} - (1 - \beta)a_i] = 0 \quad (\text{A.293})$$

We isolate the values of \bar{u} and \underline{u} in the restrictions to insert in the Principal's function.
Using A.293 :

$$0.5\bar{u} - (1 - \beta)a_i + 0.5\underline{u} = 0 \quad (\text{A.294})$$

$$0.5\underline{u} = -0.5\bar{u} + (1 - \beta)a_i \quad (\text{A.295})$$

$$\underline{u} = -\bar{u} + 2 * (1 - \beta)a_i \quad (\text{A.296})$$

Inserting A.296 in A.292

$$0.5[\bar{u} - (1 - \beta)a_i] + 0.5[-\bar{u} + 2(1 - \beta)a_i - (1 - \beta)a_i] = \pi_0\bar{u} + (1 - \pi_0)[-\bar{u} + 2(1 - \beta)a_i] \quad (\text{A.297})$$

$$0 = \pi_0\bar{u} + (1 - \pi_0)[-\bar{u} + 2(1 - \beta)a_i] \quad (\text{A.298})$$

$$(1 - \pi_0)\bar{u} - \pi_0\bar{u} = (1 - \pi_0)2(1 - \beta)a_i \quad (\text{A.299})$$

$$(1 - 2\pi_0)\bar{u} = (1 - \pi_0)2(1 - \beta)a_i \quad (\text{A.300})$$

$$\bar{u} = \frac{(2 - 2\pi_0)[(1 - \beta)a_i]}{(1 - 2\pi_0)} \quad (\text{A.301})$$

$$\bar{u} = \frac{(1 - 2\pi_0)[(1 - \beta)a_i] + (1 - \beta)a_i}{(1 - 2\pi_0)} \quad (\text{A.302})$$

$$\bar{u} = (1 - \beta)a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.303})$$

Inserting A.303 in A.296

$$\underline{u} = -a_i \left[1 + \frac{1}{(1 - 2\pi_0)} \right] + 2(1 - \beta)a_i \quad (\text{A.304})$$

$$\underline{u} = (1 - \beta)a_i \left[1 - \frac{1}{(1 - 2\pi_0)} \right] \quad (\text{A.305})$$

Now, we can insert A.303 and A.305 in A.291 to make the optimization

$$\text{Max}_{a_i} 0.5[\bar{q} - ((1 - \beta)a_i[1 + \frac{1}{(1 - 2\pi_0)}])^2] + 0.5[\underline{q} - ((1 - \beta)a_i[1 - \frac{1}{(1 - 2\pi_0)}])^2] + (1 - \beta) * g(a_i) \quad (\text{A.306})$$

The FOC is:

$$0.5[-2((1 - \beta)a_i[1 + \frac{1}{(1 - 2\pi_0)}]) * (1 - \beta)[1 + \frac{1}{(1 - 2\pi_0)}] + 0.5[(-2((1 - \beta)a_i[1 - \frac{1}{(1 - 2\pi_0)}]) * (1 - \beta)[1 - \frac{1}{(1 - 2\pi_0)}]) + (1 - \beta)g'(a_i) = 0 \quad (\text{A.307})$$

$$-2((1 - \beta)a_i[1 + \frac{1}{(1 - 2\pi_0)}]) * [1 + \frac{1}{(1 - 2\pi_0)}] - 2((1 - \beta)a_i[1 - \frac{1}{(1 - 2\pi_0)}]) * [1 - \frac{1}{(1 - 2\pi_0)}] = -2g'(a_i) \quad (\text{A.308})$$

$$((1 - \beta)a_i[1 + \frac{1}{(1-2\pi_0)}]) * [1 + \frac{1}{(1-2\pi_0)}] + ((1 - \beta)a_i[1 - \frac{1}{(1-2\pi_0)}]) * [1 - \frac{1}{(1-2\pi_0)}] = g'(a_i) \quad (\text{A.309})$$

$$(1 - \beta)a_i[1 + \frac{1}{(1 - 2\pi_0)}]^2 + (1 - \beta)a_i[1 - \frac{1}{(1 - 2\pi_0)}]^2 = g'(a_i) \quad (\text{A.310})$$

$$(1 - \beta)a_i[1 + \frac{1}{(1 - 2\pi_0)}]^2 + (1 - \beta)a_i[1 - \frac{1}{(1 - 2\pi_0)}]^2 = g'(a_i) \quad (\text{A.311})$$

$$a_i = \frac{1}{(1 - \beta)} \frac{g'(a_i)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} \quad (\text{A.312})$$

To grasp the net level of improper activities considering justice:

$$(1 - \beta)a_i = \frac{g'(a_i)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} \quad (\text{A.313})$$

To have the variation of a_i wrt β , we isolate A.313 and uses implicit function theorem:

$$a_i - \frac{1}{(1 - \beta)} \frac{g'(a_i)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} = 0 \quad (\text{A.314})$$

$$\frac{\partial a_i}{\partial \beta} = \frac{\frac{1}{(1-\beta)^2} \frac{g'(a_i)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2}}{1 - \frac{1}{(1-\beta)} \frac{g''(a_i)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2}} \quad (\text{A.315})$$

A.13.3 Assessing the Risk Measure under harassment

The risk measure is assessed by calculating $\bar{u} - \underline{u}$ in A.305 and A.303 and incorporating A.313

$$\bar{u} - \underline{u} = (1 - \beta)a_i + (1 - \beta)a_i * \frac{1}{(1 - 2\pi_0)} - (1 - \beta)a_i + (1 - \beta)a_i * \frac{1}{(1 - 2\pi_0)} \quad (\text{A.316})$$

$$\bar{u} - \underline{u} = (1 - \beta)a_i * \frac{2}{(1 - 2\pi_0)} \quad (\text{A.317})$$

$$\bar{u} - \underline{u} = \frac{g'(a_i)}{\left[1 + \frac{1}{(1-2\pi_0)}\right]^2 + \left[1 - \frac{1}{(1-2\pi_0)}\right]^2} * \frac{2}{(1 - 2\pi_0)} \quad (\text{A.318})$$

A.14 Optimal justice (sum of utilities) with punitive justice - Full Proof

Reminder: the boss' utility is 2.40 and the agent's utility, considering the incentive given, is the left hand side of 2.36.

$$S = 0.5[\bar{q} + (1 - \beta)a_i - (a_i[1 + \frac{1}{(1-2\pi_0)}])^2] + 0.5[\underline{q} + (1 - \beta)a_i - (a_i[1 - \frac{1}{(1-2\pi_0)}])^2] + \lambda(0.5[(a_i[1 + \frac{1}{(1-2\pi_0)}]) - a_i] + 0.5[(a_i[1 - \frac{1}{(1-2\pi_0)}]) - a_i]) \quad (\text{A.319})$$

$$S = 0.5[\bar{q} - (a_i[1 + \frac{1}{(1-2\pi_0)}])^2] + 0.5[\underline{q} - (a_i[1 - \frac{1}{(1-2\pi_0)}])^2] + (1 - \beta)a_i + \lambda(0) \quad (\text{A.320})$$

Now considering the optimal level of harassment to the boss in 2.42:

$$S = 0.5[\bar{q} - (\frac{1-\beta}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} [1 + \frac{1}{(1-2\pi_0)}])^2] + 0.5[\underline{q} - (\frac{1-\beta}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} [1 - \frac{1}{(1-2\pi_0)}])^2] + \frac{(1-\beta)^2}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} \quad (\text{A.321})$$

Then, using A.321, we can grasp the social optimal level of justice:

$$\begin{aligned} \frac{\partial S}{\partial \beta} &= (\frac{1-\beta}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} [1 + \frac{1}{(1-2\pi_0)}]) (\frac{1}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} [1 + \frac{1}{(1-2\pi_0)}]) + \\ & (\frac{1-\beta}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} [1 - \frac{1}{(1-2\pi_0)}]) (\frac{1}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} [1 - \frac{1}{(1-2\pi_0)}]) - \\ & \frac{2(1-\beta)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} = 0 \end{aligned} \quad (\text{A.322})$$

$$\begin{aligned} \frac{\partial S}{\partial \beta} &= (\frac{1-\beta}{([1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2)^2} [(1 + \frac{1}{(1-2\pi_0)})^2 + (1 - \frac{1}{(1-2\pi_0)})^2]) \\ & - \frac{2(1-\beta)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} = 0 \end{aligned} \quad (\text{A.323})$$

$$\frac{\partial S}{\partial \beta} = -\frac{(1 - \beta)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} = 0 \quad (\text{A.324})$$

$$\frac{(1 - \beta)}{[1 + \frac{1}{(1-2\pi_0)}]^2 + [1 - \frac{1}{(1-2\pi_0)}]^2} = 0 \quad (\text{A.325})$$

$$1 - \beta = 0 \quad (\text{A.326})$$

$$\beta = 1$$

(A.327)

Appendix B

Here are the list of variables and sources of the chapter ‘Collective memory and means of claims in democracies’, and their descriptive statistics.

B.1 List of Variables and Sources

To test quantitative hypotheses in this paper, a database on 289 municipalities (*Comunas*) was constructed with the following variables:

1. Dependent Variables

- (a) Protests: number of pacific protests, interventions and riots in Chile between October 18th, 2019 and March 15th 2020¹ per 10,000 inhabitants. The number of protests was obtained at ACLED database [195], and the number of inhabitants was obtained at the 2017 Chilean Census;
- (b) Approval Turnout: rate of participation of the new constituent plebiscite, obtained at the Servicio Electoral de Chile (<https://www.serve.cl>);
- (c) Apruebo: rate of approval of the constituent plebiscite, obtained at the Servicio Electoral de Chile (<https://www.serve.cl>);
- (d) Popular convention: rate of voting for the full popular convention as the composition of the constituent (given Apruebo), obtained at the Servicio Electoral de Chile (<https://www.serve.cl>);
- (e) Constituent composition Turnout: rate of participation of elections of the constituent members, obtained at the Servicio Electoral de Chile (<https://www.serve.cl>);
- (f) Vamos por Chile: Percentage of voting for candidates of Piñera aligned right-Wing coalition Vamos por Chile, obtained at the Servicio Electoral de Chile (<https://www.serve.cl>);
- (g) Lista del Apruebo: Percentage of voting for candidates of opposition center-left coalition Lista del Apruebo, obtained at the Servicio Electoral de Chile (<https://www.serve.cl>)

¹Period between the *Santiagoazo* and the declaration of emergency state for the COVID-19 pandemic.

- (h) Apruebo Dignidad: Percentage of voting for candidates of opposition left coalition Apruebo Dignidad, obtained at the Servicio Electoral de Chile (<https://www.servel.cl>)
- (i) Turnout 1st Round: Rate of participation on first round of 2021 presidential election, obtained at the Servicio Electoral de Chile (<https://www.servel.cl>)
- (j) Boric 1st Round: Percentage of voting for Gabriel Boric on first round of 2021 presidential election, obtained at the Servicio Electoral de Chile (<https://www.servel.cl>);
- (k) Kast 1st Round: Percentage of voting for Jose Augusto Kast on first round of 2021 presidential election, obtained at the Servicio Electoral de Chile (<https://www.servel.cl>);
- (l) Turnout 2nd Round: Rate of participation on second round of 2021 presidential election, obtained at the Servicio Electoral de Chile (<https://www.servel.cl>)
- (m) Boric 2nd Round: Percentage of voting for Gabriel Boric on second round of 2021 presidential election, obtained at the Servicio Electoral de Chile (<https://www.servel.cl>);
- (n) Kast 2nd Round: Percentage of voting for Jose Augusto Kast on second round of 2021 presidential election, obtained at the Servicio Electoral de Chile (<https://www.servel.cl>);
- (o) Constitutional Text Turnout: Rate of participation on Constitutional Text Approval, obtained at the Servicio Electoral de Chile (<https://www.servel.cl>)
- (p) Constitutional Text Approval: Percentage of voting for Constitutional Text Approval, obtained at the Servicio Electoral de Chile (<https://www.servel.cl>)

2. Main Independent Variables

- (a) DMilitaryPresence: dummy of military presence before 1970, condensed by BAUTISTA *et al.* [72].

3. Main Independent Variables (Mechanism Analysis)

- (a) Victims/10k Inhabs: number (by 10,000 inhabitants) of victimizations placed by the Pinochet regime in a municipality, condensed by BAUTISTA *et al.* [72];
- (b) Victims Residents/10k Inhabs: number (by 10,000 inhabitants) of residents victimized by Pinochet Regime in a municipality, condensed by BAUTISTA *et al.* [72];
- (c) Twitter Acc/10k Inhabs: Number per 10 thousand inhabitants of twitter accounts on a given municipality that used one of the top 5 trending topics remembering the violence of '73 Coup in the anniversary on September 11th 2019. Sample webscrapped by the service exportdata.io

- (d) Unemp: number of people officially subscribed in search of employment per inhabitants in 2017. Gathered from Sistema Nacional de Información Municipal (SINIM) and Chilean Census
- (e) Health Inv/Inhab. Value in Chilean pesos of investment in healthcare per inhabitants in 2017. Gathered from Sistema Nacional de Información Municipal (SINIM) and Chilean Census
- (f) Edu Inv/Stu: Value in Chilean pesos of investment in education per enrolled students in primary, secondary and high school in 2017. Gathered from Sistema Nacional de Información Municipal (SINIM)

4. Controls

- (a) Dist-RegCap: distance to regional capital, condensed by BAUTISTA *et al.* [72];
- (b) Dist-Stgo: distance to Santiago, condensed by BAUTISTA *et al.* [72];
- (c) Pop: population, obtained at the Chilean census 2017;
- (d) Rural: Rural share, obtained at the Chilean census 2017;
- (e) Share-Allende-1970: the share of votes for Salvador Allende (winner) in 1970, condensed by BAUTISTA *et al.* [72]
- (f) Share-Alessandri-1970 the share of votes for Jorge Alessandri (the second place) in 1970, condensed by BAUTISTA *et al.* [72]

5. Weight (Inverse standard deviation)

- (a) Pop: population, obtained at the Chilean census 2017;

B.2 Descriptive Statistics

Table A2
Descriptive Statistics

	Mean	S.D.	Max.	Min.
Dependent Variables				
All protests	1.263	6.815	124.611	0.000
Pacific Protests	0.867	6.748	124.611	0.000
Violent Riots	0.396	0.732	5.198	0.000
Turnout (Constituent initiative)	43.791	67.980	11.340	10.556
Approval (Constituent initiative)	76.270	9.871	91.770	25.940
Approval (Popular Convention)	76.676	7.291	88.600	37.200
Turnout (Assembly composition)	47.728	9.024	73.730	1.650
Vote Share for Vamos por Chile	21.503	9.209	63.820	5.790
Vote Share for Lista del Apruebo	16.687	7.956	54.200	15.035
Vote Share for Apruebo Dignidad	15.887	8.551	50.820	1.600
Turnout (2021 Presidential 1° Votation)	44.310	6.693	69.270	19.070
Votes Share for Kast (2021 1° Voting)	30.405	9.900	72.340	11.570
Vote Share for Boric (2021 1° Voting)	20.884	7.146	45.430	1.880
Turnout (2021 Presidential 2° Votation)	52.399	8.634	72.850	14.070
Vote Share for Kast (2021 2° Voting)	48.429	12.477	94.690	24.570
Turnout (Constitutional Text)	84.649	9.365	94.550	32.750
Vote Share for Text Approval	32.311	9.461	58.230	5.300
Independent Variables				
Pre-70 Bases	0.113	0.317	1.000	0.000
Victims/10k Habs	2.449	8.534	132.721	0.000
Victim Residents/10k Habs	1.500	3.127	30.041	0.000
Twitter Accounts/10k Habs	0.763	4.301	72.463	0.000
Distance to Santiago	5.355	1.706	8.235	0.000
Distance to Regional Capital	3.755	1.442	8.256	0.000
2017 Population	50791.920	78691.930	568106.000	138.000
Rural Share	36.314	28.988	100.000	0.000
Vote Share for Allende (1970)	35.153	13.279	76.778	4.167
Vote Share for Alessandri (1970)	34.718	9.726	68.421	7.798

Appendix C

Here are the list of variables and sources of the chapter ‘Tales of the Fall and Rise of (In)egalitarian Democracy: The Case of Argentina (1913-1999)’, and the full estimates using labor share decomposition.

C.1 List of Variables and Sources

To estimate the models above, the following data series were considered:

1. Dependent variables:

- (a) Gini index (GINI) - [196]: measures the inequality of income among workers.
- (b) Labor share (LSHARE) - [172]: measures the participation of aggregate wages and labor rents into the national income.
- (c) Formal urban labor share (SH_FORURB) - : measures the participation of aggregate wages and labor rents of formal urban sector into the national income
- (d) Rural labor share (SH_RURAL) - ([172]: measures the participation of aggregate wages and labor rents of rural sector into the national income
- (e) Informal Urban labor share (L_INFURB) - [172]: measures the participation of aggregate wages and labor rents of informal urban sector into the national income

2. Independent variables:

- (a) Polyarchy (POLY) - [197]: extracted from Varieties of Democracy database, it is based on the broadest concept of democracy proposed by [198]. For this database, Polyarchy is the synthesis of liberal, deliberative, egalitarian, and participative aspects of democracy.
- (b) Liberal democracy (LIBERAL) - [197]: extracted from Varieties of Democracy database, it consists of the effectiveness of protection of civil and political rights of the citizens among a country.

- (c) Deliberative democracy (DELIB) - [197]: extracted from Varieties of Democracy database, it is based on the quality of public decision-making in being based on reasonable dialogue instead of coercion or emotional appeal.

By the traditional literature [45], we can generally expect that democratization has an equalizer effect, which could reduce economic inequality and increase the labor share in national income. Thus, we expect these variables to have a negative sign related to GINI and a positive sign associated with LSHARE.

3. Other explanatory variables (controls):

- (a) Log of Gross domestic product per capita in dollars Geary-Khamis (GDPPC) and its square - [199]. According to Kuznets curve [200], the effect of higher national income on inequality varies with the development phase: underdeveloped countries have higher levels of inequality when their income is higher, and developed countries have lower inequality when they have a higher income. Therefore, one can expect an inverted U-shaped relation between income and inequality.
- (b) D-index of inflation (INF_D) - [199]: Since Argentina has passed through notable hyperinflation periods, the inflation rate was treated to reduce distortionary effects in the estimations, following the d index [201]:

$$INF_D = \pi / (1 + \pi) \quad (C.1)$$

In moments of higher inflation, richer agents usually protect their income by investing in financial assets. In contrast, poorer agents typically have less access to financial services and are more vulnerable to purchasing power devaluation. Therefore, we expect a positive sign related to GINI and a negative sign associated with labor.

- (c) Educational Inequality (EDU) - [202]: the Gini index of education level. Education has a direct effect on productivity, which impacts income, especially for workers. Therefore, it is expected that the increase of educational inequality increases income inequality and reduces the labor share in national income, which renders a positive sign related to GINI and negative sign associated with labor.
- (d) Trade Openness (OPEN) - [203]: Measured as the share of import in GDP. The openness of the Latin American economy to international trade could increase the wage premium of skilled workers and promote income dispersion [172]. Thus, one can expect a positive impact of trade openness in personal inequality and labor share.

C.2 Summary Statistics

Table C.1: Summary Statistics

Series	Mean	Median	Maximum	Minimum	S.D.
GINI	0.404	0.402	0.500	0.330	0.034
LABOUR	0.498	0.510	0.616	0.291	0.067
POLI	0.429	0.397	0.843	0.072	0.240
LIBERAL	0.321	0.247	0.664	0.071	0.178
DELIB	0.309	0.232	0.794	0.016	0.242
GDPPC	8.590	8.566	9.122	7.933	0.318
GDPPC ²	73.901	73.383	83.212	62.945	5.455
INF_D	0.212	0.136	0.969	-0.185	0.277
EDU	0.259	0.235	0.480	0.157	0.083
IMP/GDP	0.113	0.103	0.267	0.035	0.060
SH_RURAL	0.081	0.079	0.198	0.014	0.047
SH_URBFOR	0.365	0.356	0.476	0.206	0.056
SH_URBINF	0.051	0.051	0.075	0.019	0.012

Obs: S.D. relates to the standard deviation of the sample.

C.3 Full ARDL estimates – Decomposed Labor Share

Table C.2: ARDL estimation - Democracy Variable: POLIARCHY

Dependent Variable: SH_RURAL - (2, 5, 4, 4, 5, 6, 0)				
Bounds test		Critical value bounds		
Test statistic	Value	Significance	I0 Bound	I1 Bound
F-statistic	4.70	10%	2.09	3.1
K	6			
Cointegrating equation = $GINI - (-0.019 \times LIBERAL - 1.899 \times GDPPC + 0.101 \times GDPPC^2 - 0.028 \times INF_D - 0.314 \times EDU + 0.008 \times IMP/GDP + 8.984)$ ***				
Long run coefficients				
Variable	Coefficient	Std. error	t-statistic	
Constant	8.984*	(4.710)	[1.908]	
POLI	-0.019*	(0.011)	[-1.768]	
GDPPC	-1.899*	(1.060)	[-1.791]	
GDPPC ²	0.101*	(0.060)	[1.692]	
INF_D	-0.028**	(0.011)	[-2.482]	
EDU	-0.314**	(0.153)	[-2.057]	
IMP/GDP	0.008	(0.043)	[0.179]	

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey- West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.

Table C.3: ARDL estimation - Democracy Variable: POLIARCHY

Dependent Variable: SH_URBAN - (1, 1, 6, 5, 1, 1, 6)				
Bounds test			Critical value bounds	
Test statistic	Value	Significance	I0 Bound	I1 Bound
F-statistic	4.04	10%	2.09	3.1
K	6			
Cointegrating equation = LSHARE-(0.0691×LIBERAL-13.306×GDPPC-0.756×GDPPC ² -0.332×INF_D+1.009×EDU -0.481×IMP/GDP-58.192) ***				
Long run coefficients				
Variable	Coefficient	Std. error	t-statistic	
Constant	-58.192***	(18.643)	[-3.121]	
POLI	0.091***	(0.030)	[3.086]	
GDPPC	13.306***	(4.215)	[3.157]	
GDPPC ²	-0.756***	(0.239)	[-3.162]	
INF_D	-0.332***	(0.062)	[-5.351]	
EDU	1.009*	(0.593)	[1.703]	
IMP/GDP	-0.481	(0.352)	[-1.343]	

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey- West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.

Table C.4: ARDL estimation - Democracy Variable: POLIARCHY

Dependent Variable: SH_INFURB - (1, 1, 4, 6, 3, 5, 6)				
Bounds test			Critical value bounds	
Test statistic	Value	Significance	I0 Bound	I1 Bound
F-statistic	4.57	10%	2.09	3.1
K	6			
Cointegrating equation = URBINF_SHARE - (0.028*POLI+1.012*GDPPC -0.058*GDPPC ² -0.052*INF_D -0.205*EDU -0.001*IMP/GDP-4.266)				
Long run coefficients				
Variable	Coefficient	Std. error	t-statistic	
Constant	-4.266	(4,476)	(-0,953)	
POLI	0,028**	(0,012)	(2,330)	
GDPPC	1.012	(1,012)	(1,000)	
GDPPC ²	-0.058	(0,057)	(-1,017)	
INF_D	-0,052***	(0,017)	(-2,995)	
EDU	-0.205	(0,155)	(-1,324)	
IMP/GDP	-0.142	(0.090)	(-1,588)	

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey- West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.

Table C.5: ARDL estimation - Democracy Variable: LIBERAL

Dependent Variable: SH_RURAL - (3,0,4,4,5,6,2)				
Bounds test			Critical value bounds	
Test statistic	Value	Significance	I0 Bound	I1 Bound
F-statistic	4.35	10%	2.09	3.1
K	6			
Cointegrating equation = GINI-(0.098×LIBERAL-6.059×GDPPC+0.348×GDPPC ² +0.066×INF_D-0.444×EDU +0.060×IMP/GDP+26.788) ***				
Long run coefficients				
Variable	Coefficient	Std. error	t-statistic	
Constant	10.886***	(3.992)	[2.727]	
LIBERAL	-0.032***	(0.011)	[-2.871]	
GDPPC	-2.328**	(0.897)	[-2.595]	
GDPPC ²	0.126**	(0.051)	[2.482]	
INF_D	-0.016	(0.011)	[-1.486]	
EDU	-0.398**	(0.151)	[-2.627]	
IMP/GDP	0.060	(0.062)	[0.960]	

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey- West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.

Table C.6: ARDL estimation - Democracy Variable: LIBERAL

Dependent Variable: SH_URBAN - (2, 3, 6, 5, 3, 1, 6)				
Bounds test			Critical value bounds	
Test statistic	Value	Significance	I0 Bound	I1 Bound
F-statistic	3.76	10%	2.09	3.1
K	6			
Cointegrating equation = LSHARE-(0.069×LIBERAL-2.763×GDPPC-0.171×GDPPC ² -0.187×INF_D-0.792×EDU +0.353×IMP/GDP-10.392) ***				
Long run coefficients				
Variable	Coefficient	Std. error	t-statistic	
Constant	-56.087***	(17.268)	[-3.248]	
LIBERAL	0.100***	(0.035)	[2.827]	
GDPPC	12.863***	(3.893)	[3.305]	
GDPPC ²	-0.733***	(0.220)	[-3.329]	
INF_D	-0.296***	(0.064)	[-4.645]	
EDU	0.834	(0.528)	[1.579]	
IMP/GDP	-0.353	(0.286)	[-1.235]	

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey- West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.

Table C.7: ARDL estimation - Democracy Variable: LIBERAL

Dependent Variable: SH_URBINF - (1, 0, 4, 6, 3, 4, 6)				
Bounds test			Critical value bounds	
Test statistic	Value	I0 Bound	I1 Bound	
F-statistic	5.15	10%	2.09	3.1
K	6			
Cointegrating equation = URBINF_SHARE - (0.0467*LIBERAL+1.2827*GDPPC -0.0741 *GDPPC^2-0.0542*INF_D-0.1526*EDU-0.158*IMP/GDP-5.4443)				
Long run coefficients				
Variable	Coefficient		t-statistic	
Constant	-5.444		(-1,082)	
LIBERAL	0,047***		(3,260)	
GDPPC	1.283		(1,127)	
GDPPC^2	-0.074		(-1,146)	
INF_D	-0,054***		(-2,805)	
EDU	-0.153		(-1,037)	
IMP/GDP	-0.158***		(-2,098)	

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey- West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.

Table C.8: ARDL estimation - Democracy Variable: DELIB

Dependent Variable: SH_RURAL - (3, 0, 4, 4, 5, 6, 2)				
Bounds test			Critical value bounds	
Test statistic	Value	Significance	I0 Bound	I1 Bound
F-statistic	4.28	10%	2.09	3.1
K	6			
Cointegrating equation = SH_RURAL-(-0.022xDELIB-2.248xGDPPC+0.121xGDPPC^2 -0.016xINF_D-0.386xEDU +0.059xIMP/GDP+10.531) ***				
Long run coefficients				
Variable	Coefficient	Std. error	t-statistic	
Constant	10.531**	(4.021)	[2.619]	
DELIB	-0.022**	(0.008)	[-2.676]	
GDPPC	-2.248**	(0.903)	[-2.488]	
GDPPC^2	0.121**	(0.051)	[2.376]	
INF_D	-0.016	(0.012)	[-1.403]	
EDU	-0.386**	(0.154)	[-2.505]	
IMP/GDP	0.059	(0.064)	[0.928]	

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey- West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.

Table C.9: ARDL estimation - Democracy Variable: DELIB

Dependent Variable: SH_URBAN - (2, 3, 6, 5, 4, 1, 6)				
Bounds test			Critical value bounds	
Test statistic	Value	Significance	I0 Bound	I1 Bound
F-statistic	4.36	10%	2.09	3.1
K	6			
Cointegrating equation = SH_URBAN-(0.097×DELIB-13.813×GDPPC-0.786×GDPPC ² -0.339×INF_D-1.003×EDU -0.470×IMP/GDP-60.350) ***				
Long run coefficients				
Variable	Coefficient	Std. error	t-statistic	
Constant	-60.350***	(16.205)	[-3.724]	
DELIB	0.097***	(0.027)	[3.517]	
GDPPC	13.813***	(3.651)	[3.783]	
GDPPC ²	-0.786***	(0.206)	[-3.808]	
INF_D	-0.339***	(0.063)	[-5.395]	
EDU	1.003**	(0.491)	[2.043]	
IMP/GDP	-0.470*	(0.263)	[-1.790]	

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey- West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.

Table C.10: ARDL estimation - Democracy Variable: DELIB

Selected Model: ARDL (4, 0, 4, 6, 3, 4, 6)				
Bounds test			Critical value bounds	
Test statistic	Value	Significance	I0 Bound	I1 Bound
F-statistic	5.21	10%	2.09	3.1
K	6			
Cointegrating equation = URBINF_SHARE - (0.034*DELIB + 1.206*GDPPC-0.070*GDPPC ² -0.057*INF_D -0.149*EDU-0.167*IMP/GDP-5.108) ***				
Long run coefficients				
Variable	Coefficient	Std. error	t-statistic	
Constant	-5.108	(-4.609)	[-1.108]	
DELIB	0.034***	(0.010)	[3.444]	
GDPPC	1.206	(1.042)	[1.157]	
GDPPC ²	-0.070	(0.059)	[-1.180]	
INF_D	-0.057***	(0.019)	[-2.982]	
EDU	-0.149	(0.138)	[-1.083]	
IMP/GDP	-0.167**	(0.066)	[-2.513]	

Note: Model selection is based on Adjusted R-squared. Marginal significance levels: (***) denotes 0.01, (**) denotes 0.05, and (*) denotes 0.10. Robust standard errors (Newey- West) are in parentheses and t-statistics in brackets. Critical value bound based on Nayaran (2005) for 80 observations.