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Explorando la factibilidad del Seguro de Desempleo en Nuevo

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Abstract: This paper explores the feasibility of unemployment insurance in Nuevo León, Mexico. It starts by exploring the policy context, in which we pay special attention to societal challenges such as robotization that can revitalize the debate on a social policy that was historically absent from the Mexican welfare state. The paper proposes a model of unemployment insurance adapted to this context, drawing on insights from a literature study, a public opinion survey and a cost calculation. The innovative feature of this model is adaptability, where key variables change along with the situation on the labor market.

Keywords: Desempleo, política social, robotización, seguro de desempleo.

Resumen: Este artículo explora la factibilidad del seguro de desempleo en Nuevo León, México. Comienza explorando el contexto político, en el que prestamos especial atención a desafíos sociales como la robotización que puede revitalizar el debate sobre una política social históricamente ausente del estado de bienestar mexicano. El documento propone un modelo de seguro de desempleo adaptado a este contexto, basándose en conocimientos de un estudio de literatura, una encuesta de opinión pública y un cálculo de costos. La característica innovadora de este modelo es la adaptabilidad, donde las variables clave cambian junto con la situación en el mercado laboral.

Palabras clave: Robotization, social policy, unemployment insurance, unemployment.

1 - INTRODUCCIÓN

This paper discusses the feasibility of introducing unemployment insurance in the Mexican state of Nuevo León in the context of new societal challenges such as robotization. While Mexico is one of the countries with higher GDP in Latin America, historically it did not follow the pattern of implementing unemployment insurance like other countries did when they could afford to do so (Velásquez, 2016, p. 97). Mexico did not implement an unemployment insurance (from here also referred to as UI) during the rise of the welfare state in the 20th century, nor during the 'pink wave' (which bypassed Mexico) of socialist reform in early 21st century. This is consistent with a broader trend of Mexico underspending on social policy relative to its needs (Cecchissi, Filgueira, Robles, 2014; Valencia, Foust, Tetreault, 2012; Economic Commission for Latin America and the Caribbean - ECLAC, 2019). Although the

political debate is still ongoing, UI is not included in the first wave of social policies (universal pensions, youth employment programs, etc. of the so called 'Fourth Transformation' that started in 2018.

Given Mexico missed the boat on organized solidarity with the unemployed before, this paper aims to explore the feasibility of such policies in the context of new emerging societal risks. While the global pandemic spurred debates on income compensation around the world, our focus will be on the challenge of robotization. This new wave in industrial development is conceptually different in so far that unlike mere tools, robots replace specific human capacities (talking, analyzing…) with a certain degree of autonomy. The potential broad impact of these developments threatens a rise in structural unemployment, even in regions with traditionally low unemployment, such as Nuevo León. This paper uses a mixture of theoretical and empirical insights to develop a model of UI that can adapt to such unpredictable economic scenarios.

In what follows we will first further explain the design and method of this study. Next, in our theoretical part we will discuss both robotization and unemployment insurance in more detail. This is followed by the results of a street survey. The exposed insights will be used to construct an innovative conceptual model of UI, which at the end will be subjected to a brief cost-analysis before drawing conclusions on the feasibility of implementing this model.

2. - THEORICAL FRAMEWORK

The challenge of robots and other societal disruptions

The 21st century brings a new social challenge to Mexico: the threat of sustained replacement of human labor by robots and artificial intelligence, amplified by a global pandemic. The process that we call 'robotization'(often also called automatization) refers to the current development and implementation of advanced robotics and artificial intelligence in all aspects of our economy (Johannessen, 2018). This development is sometimes referred to as the 'fourth industrial revolution', implying that robotics and A.I. will cause a similar disruption as the steam engine, electricity and computers did. We consider robotization to conceptually consist of technologies aimed at a) replacing specific human functions (such as speech, navigation, analysis, etc.); b) doing so with a degree of independence (see Ghys et al. 2021). A qualitative difference with earlier advancements in machines is that these are often not 'tools' used by humans to perform tasks but replace the human herself: the self-driving taxi doesn't have a second driver.

Various authors have warned of the societal and economic impact of robotization, especially when related to the labor market (Rifkin, 1995; Brynolfsson and McAfee's, 2014; Johannessen, 2018; Oppenheimer, 2018). A much-debated subject is the extend of this problem, in which commentators are divided between more optimistic and pessimistic views. A common method of estimating is based on estimations of

experts on the possibility of automating occupations and the presence of capacities that robots cannot do. Frey and Osborne (2013) were amongst the first to make such a meta-estimation and wrote that 47% of jobs in the U.S. could be lost to automation. Arntz et al. (2016) gave a more conservative estimate of 9% job loss in the U.S., using variations within jobs and conservative estimations of what robots could do. One of the most comprehensive studies is that of Nedelkoska and Quitini (2018), which both covers 32 OECD countries (but not Mexico) and it takes into account evolutions in machine learning. They estimate that globally roughly 14% of jobs are at high risk (<70%) of being automated, while 32% have a risk higher than 50 percent. Formulated differently, the median job has 48% chance of being automatized (Nedelkoska, Quintini, 2018 p. 48). While this does hit low-skill manufacturing jobs hard, robotization also affects the service sector, and few professions are immune to it (Nedelkoska, Quintini, 2018). While the risk might be uneven, it is thus more even than with other industrial revolutions (Standing, 2017, pp. 105-106).

There are no calculations for Mexico, but the Mexican economy shares various risk factors such a being historical manufacturing industries (Nedelkoska, Quintini, 2018) or having less educational attainment (Compare OECD, 2022) with high-risk countries. A survey by Boston Consulting Group (Küpper et al, 2019) indicates that 87% of Mexican companies plan to adopt advanced robotics in the next three years. They found that despite expected growth in productivity, 51% of companies expect an absolute reduction in their number of workers in the next five years because of this.

Even if one would reason that the impact of robotization would be like that of previous disruptions (see Autor, 2015), guiding this process towards a non-catastrophic outcome still requires active policy interventions. Ghys et al. (2021) sketch a spectrum of policy responses to robotization in the Mexican context, distinguishing between preventive, mediating and compensating responses. The first group is aimed at avoiding the replacement of humans by machines, such as halting investment in robots or taxing them, to promoting labor intense sectors. The second mediates the effects of automation, by preventing the loss of jobs to lead to long term unemployment. This includes re-education, as well as work time reduction, the promotion of cooperatives or de-populating the labor market by lowering pension ages. The final group of solutions focuses on compensating people for the loss of income, such as universal basic income and bolstering UI. Notice that UI is thus an incomplete solution aimed at compensating the consequences of such societal dislocations, and by itself does not cure them.

Before turning to this specific policy, we want to briefly discuss the relation to the current Covid19 pandemic. One direct relation is that early evidence in other countries suggests that the pandemic itself increased the rate of automated job replacement in the economy (Leduc, Liu, 2020; Sedik, Yoo, 2021), enhancing the dynamics described above. Furthermore, pandemics pose a similarly unpredictable and non-

cyclical challenge to the labor market unlike the ones typically faced by late 20th welfare states. In that sense, just like robotization the current health crisis poses a new context to re-open debates on social protection, potentially adding to the momentum for introducing UI in previously hostile contexts. Early evidence from the U.S. indicates that the pandemic bolstered support for safety-net programs such as unemployment insurance (Rees-Jones et al, 2020). Hence, we argue that the current developments in terms of robotization and the pandemic strengthen both the need and public support for developing a model of UI in Mexico.

Unemployment Insurance in Mexico: the missing leg of the welfare state?

Unemployment insurance generally refers to programs that pays individuals a monthly amount in the months after losing their (formal) work. The extend, duration, access criteria and funding methods for this program can vary strongly between countries. In most cases, these workers have previously contributed to the fund that pays them. Additionally, individuals are typically required to cooperate in job searching or participate in any vocational program the government offers them. This public policy is part of the social insurance pillar of the welfare state (Garland, 2014), in which people build up an insurance against misfortune through work. Social insurance should not be confused with social assistance, which is aimed at helping people based on their current needs (rather than risks) without contribution criteria.

Besides being a human right, UI programs are popular worldwide because they fulfill three functions: 1) to cushion the impact of job loss on the incomes of working families; preventing poverty or downwards social mobility; 2) to act as a macroeconomic stabilizer of household demand during crisis; 3) Improving labor markets by giving the unemployed opportunities to match their skills and employment (see Vodopivec, 2013; Van Breugel, 2016; Velásquez, 2016; Abramo, Cecchini, Morales, 2019). UI also hands governments a tool to promote formal work with both a 'carrot' (inclusion in the insurance) and a 'stick' (the risk of being kicked off).

A common misconception about UI, is that this would only work in richer Northern countries, which ignores that social protection programs were adopted in many developing countries (Vodopivec, 2013). Latin America has seen a significant increase in welfare policies over the past decades (Cecchissi, Filgueira, Robles, 2014; Abramo, Cecchini, Morales, 2019). This expansion of social policy which in most countries happened in the early 20th century was overall successful in reducing poverty. More recent data by ECLAC (2019) confirms that Mexico has been unsuccessful in reducing poverty and inequality largely because they spend less on social programs. Unemployment insurance can be found in amongst others Argentina, Brazil, Chile, Uruguay and Equador (Velásquez, 2016, p. 87). While the policy is feasible in comparable or even economically weaker countries than Mexico, one of the challenges of

the Latin context are the high rates of informal labor. Given many people don't have access to social security in general, they are also excluded from this insurance, limiting it's potential to reduce inequalities.

If we zoom in to the Mexican level, we see that unemployment insurance does not exist as a national policy. The closest policy is severance pay, where workers can argue for a one-off payment when they get fired. If we stretch the concept of UI to the limit, there also exists a provision to once every five years convert social security savings into a single month's payment in case of unemployment longer than 46 days (Comisión Nacional del Sistema de Ahorro para el Retiro, 2021). UI in a recognizable form does exist on a state level in Mexico City. The 'Seguro de Desempleo' started in 2007, only covering people who involuntarily lost their job in the formal sector. It has since expanded to include different other groups and risks such losing your livelihood due to natural disasters and the Covid19 pandemic. It is open to people between 18 and 67 who have worked 8 months in the formal sector, and in 2021 would pay people 2,724 peso per month for six months every two years (Gobierno de la Ciudad de Mexico, 2021). Note that this variant is funded through the general budget instead of social security contributions (hence it is technically not an insurance model).

The absence of unemployment insurance on a federal level does not mean it was never attempted or discussed. The Peña Nieto government proposed it as part of a set of social reforms in 2013, responding to pressure from international organizations and to the increased vulnerability of low pay workers after legal changes made short term contracts more flexible (Velásquez, 2016, p. 105). The initiative never passed the senate for political reasons, but the design also showed certain flaws (see Bensusán, 2014). One of them is coverage, since the eligibility requirements were extremely strict: one had to first have paid for 24 months, and one could only use this one every five years after a 45-day waiting period. Additionally, it did not include funding for employment and training promotion. Finally, the program was financed through the housing and pension fund that workers contributed to - essentially a reshuffling of social rights rather than redistribution. The above factors, combined with the low benefits paid, made the design a misfit for the objective of protecting workers (Velásquez, 2016, p. 106).

Recently, the issue became politicized again, interestingly by both representatives of opposition and majority parties. At the time of writing the concept is discussed in the labor commission of the senate. Note that while this policy concept is seen as feasibly by key legislators in the majority, it is not part of the official government program, making its future unpredictable. In Nuevo León the policy has not been proposed nor enacted by officials.

3. - METHODOLOGY, SAMPLE PERIOD AND DATA USED

The objective of this study is both do discuss the importance and feasibility of introducing unemployment insurance to Nuevo León, and to present a model for doing so. In most countries UI is implemented on a national scale (due to better risk and resource pooling), thus our state-delineation requires justification. While this social policy indeed works better on a federal scale, now of writing the only precedent in Mexico is its implementation on a state level in Mexico City. Nuevo León offers an interesting case, since it is an industrialized region with below average levels of informal labor and poverty (making it more feasible to implement).

Methodologically, the argument in this paper draws on three types of information: a literature study, a survey of citizens of Nuevo León, and a simplified cost analysis.

The literature study is aimed at laying the theoretical groundwork and focusses on a) the implementation of unemployment insurance in a Latin context; b) the impact of automatization (and to a lesser extent the pandemic) on unemployment and relevant policy responses. Besides providing theoretical and conceptual background, the objective of this study was to better understand how UI would be feasible and which design choices should be made to adapt such a model to the needs, possibilities, and particularities of this specific policy context.

Empirical data was collected in a street survey with 366 citizens regarding their views on unemployment insurance and robotization. As we will detail later, we consider public opinion a key variable in the feasibility of social policy and use this data in the development of our model. The survey was collected during fall and winter of 2019, the last semester before the Covid19 pandemic. While the age of the data has some limitations due to the changed policy context since the pandemic, it is unclear whether this has a profound impact on the public opinion on UI.

The surveys were conducted in Monterrey, reaching a public of urban residents and visitors. The bulk of the surveys were performed on the central square of Macroplaza: a large public square with street vendors and parks that borders on both a nightlife district, popular shopping streets, museums, and the local congress. In addition, a small number of surveys were performed near other common spaces such as Fundidora Park. Our survey did not include questions on the socio-economic status of respondents, but we explicitly chose locations that would give us the best opportunity of encountering all socio-economic classes and represent the general electorate. The surveys were collected by a team of both male and female interviewers. The survey consisted of fourteen questions (in Spanish), included both closed and open questions. The collected data was cleaned and analyzed via SPSS statistics. For questions that all 366 surveys were valid, this gave us a confidence interval of 5.12% at a 95% confidence level.

After discussing the literature and the findings of our survey, we will present a brief cost analysis of the proposed model for Nuevo León. This discussing will be limited to the payment of benefits itself for a stable population over a one-year period. Besides informing discussions on the feasibility, this helps to demonstrate the functioning of the model. The exact calculation and uncertainties will be detailed later. It is important to note ahead that the need for protection against unemployment is inherently unpredictable (with unemployment rate, take-up rate and duration as an uncontrollable variables) and that many of the variables could only be roughly estimated without national precedents. However, keeping Bardach's (2001) advise in mind that while one can always find reasons not to engage in projections because it will always be incomplete, we should do it regardless to contribute to the debate implementing UI in Nuevo León.

4. - RESULTS

Criteria for a feasible operationalization

How to implement such a policy in the specific Northern Mexican context of Nuevo León? Considering the insights from our literature study and the discussion above, we propose three general criteria to guide the policy analysis and design, which we will later use to develop our model: effectiveness, societal support and adaptability.

Effectiveness

Our first criterion is that UI must be effective in compensating for unemployment. In the past many Mexican social policies and policy proposals related to unemployment have fallen short of protecting people from poverty, either because the compensated too little, were extremely limited in duration or only covered a fraction of the population (Valencia et al., 2012).

Since UI replaces and not supplements employment, the UI should be conceived as sufficient by itself, as one cannot both claim to be unemployed and generate income from work (Cecchissi, Filgueira, Robles, 2014). A glance at the CONEVAL income poverty line helps to envision this more clearly. CONEVAL offers two lines: one for normal poverty and one for extreme poverty. They are both tied to the cost of a basic of goods, with one being the absolute minimum and the other including other goods and services required for dignified societal participation. In November 2021, the extreme poverty line stood at $1.447 pesos per month (all numbers in this section are expressed in pesos) for the countryside, and $1.879 in cities, while relative poverty meant having less than $2.761 per month in rural areas and $3.898 in urban ones (CONEVAL, 2021). UI should thus at a minimum be

above the urban extreme poverty line to be effective given Nuevo León's predominantly urban population.

Additionally, effectiveness also means that the insurance should cover a sufficiently large number of people to have a macro-economic impact and cannot be limited to for example only state workers or people replaced by robots. UI typically only covers people with formal employment (who pay taxes), which excludes over half the workforce in Mexico (55.6% in October 2021 according to INEGI, 2021), however Nuevo León normally has the lowest rate of informality. While informality is an important caveat when considering the feasibility of this policy in relation to other alternatives, including the entire population would fundamentally change the character of the policy (and its cost) and will thus not be considered here.

Relation to popular support and opinion

It is hard to separate the feasibility of a social policy from the popular support it can sustain. This is especially true for policies that are built on solidarity: "Sustaining generous welfare states over long timescales requires the support of electorates" (Horton & Gregory, 2010, p. 270). This doesn't not mean that both policies and policy makers cannot challenge or shape popular attitudes but taking them into account can be an asset in policy design. For this reason, we have included a survey of citizen attitudes towards both UI and its main variables in our research.

Unemployment insurance is sensitive to popular opinion for two reasons: stigma against unemployment and the need for reciprocity. Poor and unemployed people face stigmas and are often seen as undeserving of help, which can hinder poverty reduction (Royce, 2015; Gans, 1995). For UI the stigma of laziness is relevant, given we are dealing with people who are not working: "In designing and implementing inclusive social and labour policies, one key element is the deconstruction of the idea that laziness is the main cause of poverty" (Abramo, Cecchini, Morales, 2019, p. 28). While sociology has a long history of debunking such stigma's, this has implications for how generous the design can be if it wants to be politically feasible.

The solidarity that social insurance schemes require is also related to the concept of reciprocity, implying that those receiving benefits should contribute or cooperate in some way (Horton and Gregory, 2010, p. 272). This includes making some form of financial contribution to the insurance fund or the state, which even in low amounts helps workers to claim ownership of the program and their rights within it. For this reason, coverage for the informal contributions is difficult to image, unless (informal) workers would be allowed to voluntarily sign up for this. Another form of reciprocity relates to things people should do while receiving benefits, which at a minimum would include making efforts to 'get off' the program and reintegrate into the labor market. But we could interpret this demonstration of good will and merit in a broader sense and

include for example engaging in (re)training activities, care for others or volunteer work.

A last important factor that influences support are considerations of fairness and self-interest. The latter implies that social policies with a broad coverage create more people with an interest in maintaining them and reduces the risk of stigmatization. As mentioned earlier, one 'advantage' of re-approaching the discussion on UI in the context of robotization and pandemics, is that both policies threaten broad layers of society and thus could generate more solidarity.

Adaptability to an uncertain future

Earlier we already demonstrated that the context of new societal challenges can influence the feasibility of different policy designs. A distinctive characteristic of large societal challenges like robotization or pandemics is their unpredictability. UI is intended to provide social security in the context of both 'normal' structural unemployment and cyclical downturns of the labor market. It also provides for macroeconomic stability in the case of crisis. With automatization, we have a process that a) is hard to estimate in terms of outcomes, b) might have either permanent or at least mid/long-term consequences in terms of employability. As we saw, new globalized risks like virus outbreaks are similar in this regard and can reinforce the automation dynamic.

The total amount of job loss from robotization is hard to estimate, and the question remains how much the loss of roughly half the current jobs translates into actual unemployment. Besides the possibility of new jobs or other economic changes, that largely depends on which other policy measures are taken to contain or mediate the consequences. Yet as robotization causes people's skill sets to become obsolete, we might face a more permanent type of replacement. Even if one is optimistic, at least on the short to mid-term a persisting problem of unemployment can develop.

This scenario in which there is little prospect of jobs questions the design of UI in various ways: First, in terms of financial sustainability, as we need to consider the possibility of a linear (not cyclical) expansion of the number of beneficiaries. Second, in terms of effectiveness, since for example a six-month coverage is a limited compensation in a context with structural high unemployment. Third, in terms of reciprocity, it makes little sense to require people to look work that doesn't exist, other types of merit must be included (study, care, etc.).

Introducing unemployment insurance in a 21st century context of robotization and similar challenges would thus ideally ask for an UI that works in various degrees of escalation, including a long term 'doom' scenario. At the same time, the policy must be introduced in today's economy, considering the previous two criteria. We will forward a model aimed to meet these criteria, after considering the data from out survey.

Survey of public opinion

In this part we present the results of a street survey of 366 citizens of Nuevo León during fall and winter 2019. Bear in mind that this was the last semester before the Covid19 pandemic, and for example price inflation must be considered when interpreting these results.

The first part of the survey was concerned with the context of robotization. The survey opened (before reflecting on this issue during other questions) with the question if people are worried that robots and artificial intelligence will cause an increase in unemployment. A small majority of 58.7% responded affirmative to this question (N366), indicating this is a concern of a sizable part of the electorate. Next, we asked if they considered that a robot could do their job, either fully or partially. Of the 366 respondents, 13.9% answered completely, 55,2% partially and 30.9% deemed their job to be irreplaceable. We can thus conclude that sizable majority acknowledges that replacement is possible for them, although not everyone sees this as an immediate danger.

Moving to the question of responsibility, we asked citizens who they considered most responsible for preventing poverty if robotization does lead to increases in unemployment. People hold companies as the prime responsible (47,9%), followed by the government (38,8%) and in last instance individuals (13,7%). Conversely, almost seventy percent (69,1%) of respondents think that individuals carry the least responsibility, followed by 16.9% absolving the government and 13.9% companies. This stands in contrast to the common conservative imaginaries of Nuevo León citizens surrounding poverty, where individuals are often blamed (see Inzunza, 2018).

The survey next moved to the central topic of unemployment insurance itself. Respondents were asked if when individuals lost their work due to robotization, they should receive temporal replacement income. Support for such measures turns out to be broad, as 86,9% answered positive to this question (N366).

Interestingly, an even larger part agreed when asked at the end of the survey if this should also be given to people who lost their job due to other causes than robotization - in other words: general UI. Out of our sample of N366, 91,5% of respondents thought that all workers should be protected, while only 8.5% objected. The fact that the number is slightly higher than those who initially agreed to compensation for robotization might be explained by the fact that this question came at the end of the survey. Even if the difference is less than our margin of error (5.12%), some individuals could have changed their mind after better understanding what UI was.

Next, we will discuss questions pertaining to the policy design. First is the question on if a temporal support existed, how much money would be sufficient for them. Notice that the question is framed in a personal sense, to avoid stereotypes about other groups and stimulate actual estimates of what citizens think is sufficient. All answers were converted during data cleaning to a month amount (assuming four weeks and 30 days

per month). Given this was an open question, the number of valid responses was N319. The survey showed a wide range of responses, from 1.200 to 150.000 Mexican pesos per month (an earnest response). The mean response was 9506 pesos, while the median was 7000 pesos. The most frequent answer was 5000 pesos, with 17,2% of respondents giving this estimation. Other relevant (but not computable) answers included people who answered their current wage or a certain percentage of it.

To contextualize this data, we will compare it to some income lines at the time, which since have all risen due to inflation or policy change. We observe that people indicated amounts that are both much higher than the federal (urban) poverty line, minimum wage, or most federal cash transfers. The universal minimum pension was 1275 pesos in 2019 (it has risen annually since then), while 99,7% of respondents named a higher amount. To elaborate, 98,7% of respondents wanted an amount higher than the urban extreme poverty line (1561 peso in September 2019, see CONEVAL 2021), while 88,7% expected more than the urban income poverty line (3091 pesos in September 2019). This validates our feasibility criteria of sufficiency, although this can partly be explained by the higher income in Nuevo León. The expectation is in line with a role for UI to provide social security (keeping one in position), rather than absolute poverty alleviation.

Our survey also asked respondents how many months they think one should be able to receive this support. A total of N349 answers were processed, with 17 people either not answering or not answering with a concrete number of months. Of those 17, we must note that 12 answered some variant of an indefinite term or 'until they find a job', which would increase the average. Of the remaining N349, the average amount of months was 6.97, while the median was 4 months. This difference comes from some outliners on the high-end, including one person who pleaded for 20 years. The most frequent answer was 3 months (28,1%), closely followed by 6 months (24,6%) and 12 months (14.9%). This outcome is like the range of six months used in Mexico City.

Finally, we polled respondents about reciprocity and adaptability. For the first, we asked if people using this program should be conditioned to undertake any type of activity while receiving money. Of the N366 responses, 83,1% prefers that people are required to do activity while receiving benefits, while 16,9% don't think this is necessary. This validates our earlier estimation that citizens do care about including some form of reciprocity.

Lastly, we asked if a compensation system was in place, should that system increase the support if the problem worsens. The question does not specify if this refers to the benefits, duration (it was asked after introducing both) and whole new components, as it is a probe for the general principle of an adaptive design. Breaking it down into more specific questions would have complicated the survey with technicalities. Of the N366 responses, 69,4% of respondents indicated that more should be done if the problem worsens, while 30,6% answered no.

The survey of Nuevo León citizens proved to be a valuable addition to our analysis. Even if the topic of robots is not politicized in Nuevo León, most respondents show concern and feel vulnerable to replacement. Additionally, they tend to not individualize this problem, but look for larger actors such as companies and governments for compensation. The most important finding is that there is widespread support amongst voters for compensation systems such as UI, as well as for expanding such efforts if the problem worsens. The responses confirm the concerns forwarded earlier in our analysis regarding sufficiency and reciprocity.

Conceptualizing a feasible model of adaptable unemployment insurance

In this part we present a proposal for an adaptive model of unemployment insurance that is adjusted to the context of robotization, and the criteria established before. We will first elaborate on the general logic of the model, before discussing certain policy choices. The resulting conceptual model will be budgeted in the final part of the paper before the conclusion.

We cannot predict the exact trajectory and impact of robotization, which could range from a period of adaptation to societal breakdown. It is thus hard to design an optimal policy configuration for all scenarios. An example is the duration of the support: one can argue that a short duration is best to keep the work incentive if opportunities are available, while a longer duration is needed to protect people in a scenario were there simply not sufficient jobs.

The main innovative design feature will thus be flexibility. We propose a model of unemployment insurance that is adaptable in its design structure to different labor market scenarios. It will consist of different 'tiers' in which the program can function, which each consist of a certain configuration of key parameters. The core variable that decides the 'tier' is the level of unemployment, which in turn will impact the income compensation, duration, reciprocity requirements and funding. This allows UI to adapt its role, moving from an additional temporary protection layer focused on labor market reactivation in the present economy, to a societal survival mechanism in crisis scenarios of persistent unemployment. Given the gaps between the tiers are quite large, it will still provide a relatively stable and predictable structure.

The proposed UI will be a mandatory scheme that covers all adults from age eighteen to age sixty-four and eleven months (the starting age of the universal pension). The replacement income would be claimable after a minimum of two years of formal work cumulated over the career (not in one contract). For many young people this will in practice raise the application age to twenty.

The insurance only covers formal sector workers or (potentially more broadly) workers who have social security. This is the standard configuration in almost all countries, although we must be conscious this excludes large groups of people in Mexico's case. While this is ethically undesirable, in terms of administrative complexity (it would require heavy monitoring to include informal work), funding and popular

support, this is politically the most feasible option. We suggest exploring the option of a restricted version for informal workers.

Operationalization of adaptable unemployment insurance

The following discusses some of the policy choices that we consider feasible in our conceptualization of unemployment insurance in Nuevo León. Table 1 gives a visual overview. The first column reflects the gravity of the situation on the labor market, which determines the tiers in which the model operates. In times where there is no economic crisis, this could also serve as a very loose proxy of the impact of robotization. This leads to three tiers. The first reflects the 'normal' situation of unemployment that remains under five percent. The second reflects a strained situation with between five and ten percent unemployment. The third reflects a deep employment crisis, with unemployment between ten and twenty five percent.

Financial compensation

The second column deals with the financial compensation. It should be noted that we propose exploring the option of giving the beneficiary both a crash transfer and healthcare coverage. The logic is that the benefit decreases in generosity if the unemployment rate goes up. In the first tier the UI starts with the 'full' benefit (X). In the second it becomes regressive, which means that each month it pays less until half the original sum is reached by the end of the maximum period. In tier three the unemployment insurance starts at this minimum.

This choice has drawbacks, for example that people's financial need could increase over time as they drain other resources. We primarily consider this feasible for budgetary sustainability since the system will have to cover more people. A secondary consideration is that this forms an incentive to keep attempting entry to the labor market, which balances the increased generosity in time (discussed in next section). Third is that this justifies a higher payment in the 'normal' situation, which is in line with our criteria of effectiveness.

Regarding the payment, we suggest following the example of Mexico City of having a fixed sum for all beneficiaries instead of a percentage of the previous wage. Administratively this seems the most straightforward option in a country with massive income inequality, where costs would become very unpredictable if high wages needed to be considered (also forcing the program to fully rely on contributions for funding). While not included in our calculation for the sake of simplicity, we advise exploring the option of allowing a variation of rate X depending on the family composition of the beneficiary. For example, the UI could allocate a 1,3. (X) benefit rate for people with dependent children.

For the range of the payment, we propose that the starting value X is above the federal (urban) income poverty line (effectiveness criteria),

since this social program is intended to protect from poverty. The minimum value that X regresses to in the other tiers should be above the (urban) absolute poverty line to guarantee survival.

Table 1
Model of tiered unemployment insurance

Unemployment	Amount paid Logic: decreases	Duration Logic: increases	Requirements Logic: broadens
< 5% Tier 1: current situation	Flat amount X (f.e. 5000 peso)	Y months (f.e. 6 months)	Job search
5 - 10% Tier 2: strained situation	Regressive from X to ½ X over time	2.(Y) months (f.e. 12 months)	Job search Education
10 - 25% Tier 3: employment crisis	½ X (≥ extreme poverty)	4.(Y) months (f.e. two years)	Job search Education Volunteering

Own elaboration (2021).

Duration

The logic is that the that maximum period to receive help increases if the labor market situation gets worse. This is part of the internal balance of our model, in which payment gradually decreases but the duration expands. The reasoning behind it is threefold. First, reintegration into the labor market becomes less realistic for all citizens if unemployment would increase. Second, as the crisis deepens, the concern for work incentive becomes less relevant, and gets internally compensated by the regression in the payment over time. Third, as the chances of a smooth transition to new jobs decrease, more and deeper efforts of retraining are required, which should be accompanied with sufficient time. Note that it becomes longer but not indefinite, implying that UI is not a final solution, and the state does not give up on the right to work.

We propose that the duration Y doubles with each new tier. If (re)training is supposed to be part of this policy, this duration cannot be too short. A trimester (4 months) would be the smallest common educational unit. We suggest the duration of 6 months as the basic value of Y, in line with how it works in Mexico City and following the average (6.9) response of the survey. This means that if the economic situation does not change, the UI would only last a relatively short duration. In tier two the maximum duration would be 12 months, in tier three 24 months.

The last related topic is the maximum usage: when can people reapply to UI after having used it before. One could follow the example of Mexico City where this is once every two years, requiring people to have worked in between, thus including notions of merit and contribution.

Activity requirements

The survey indicated that most respondents think people should do 'something' in return. The general logic of the model is that the activities

one can do to signal reciprocity or societal value should broaden over time. In our example, initially the requirement is to find work, while it broadens in later tiers to training, care and volunteer work. The argument is that the chance of finding work realistically decreases as the unemployment rate goes up, generating demand for other ways of expressing good will. Additionally, when beneficiaries are given more time, they can engage in larger commitments such as extensive training programs.

The minimum requirement is that people search for and are willing to accept work. Training is added in the second tier. One could argue that this should be available since the start, yet the time restraints make this harder. The care for others is added as an example of a different approach to societal merit and life purpose. Given this is harder to evaluate and requires longer time commitments, it is reserved for a crisis scenario. Finally, we have the option of volunteer work. This option often a popular alternative in the public imaginary, yet there are reasons for not making it available earlier. If the work is substantial and not charitable, people are doing labor that potentially could be real jobs like maintaining public parks. This potential perverse effects on the labor market should be reserved for situations in which human labor in these jobs is rendered uncompetitive. This would Also force people due to real work but still count as unemployed.

Funding

Given that the choice for funding mechanisms is largely political, we limit ourselves to a general outline of principles and considerations. The policy is open to three sources of funding: the state (general revenue), contributions from workers based on their wages and a tax on companies. The proposed logic is using a combination of sources, with the first two sources staying (proportionally) stable and the tax on companies increasing if their efforts in robotization lead to more unemployment. The argument is that those responsible for furthering robotization are increasingly held responsible for the compensation of the effects this has on society. Our survey indicates that more citizens consider companies to be the prime responsible for compensating increases in unemployment due to robotization. A second argument is that such a forecasted tax increase might also be an incentive to avoid or contain human replacement.

Looking at the individual sources of funding, the part carried by the state should at a minimum cover the extra overhead costs not covered by other sources. It would be technically possible for the state to fund a much larger part (or all) of the unemployment insurance, as is the case in Mexico City. However, in this scenario the lack of a specific income source poses certain hard budgetary limits. For example, in Mexico City the program is only budgeted to cover 4.8% or 14,450 people out of the unemployed target population (Gobierno de la ciudad de México, 2021).

Mandatory contributions for formal workers can be integrated to give a sense of ownership and reciprocity and is the standard form of funding

in many European countries, where it is calculated as a (progressive) percentage of their wage and paid automatically via their employers. In the Mexican context it is more feasible if this contribution is small in comparison to the other types of funding. This to a) avoid pressure on wages; b) maintain electoral support; and c) acknowledge that the workers carry the least responsibility for robotization of the three actors.

The funding through companies itself can take different forms. The 'classic' form in many welfare states is that the employer's contribution to unemployment insurance is part of their social security contributions for workers – essentially an alternative take on worker contributions. An alternative would be to create a special tax that is not directly part of payroll contributions. A solidarity tax on profits would be the most straightforward path, although inventive taxing that are more directly related to robots (either on a company or sectoral level) should be investigated.

Cost estimate

In this part we explore a cost analysis of the proposed model. Our purpose is merely to contribute to the discussion of the feasibility of this policy, and the following is to be seen as a rough starting point. Important limitations are that: a) the analysis will be for the costs of a static unemployed population in a single year. This means that they hypothetically all apply at the same time, and no cases from the previous year are carried over; b) the analysis is limited to the cost of the payouts, not related services, or overhead costs. As a reference for the latter, we refer to the example of Mexico City which budgets 5% of the total cost. Our calculation will be cautious and err towards overestimation when deciding variables. We will first show how each tier works individually, and later show how the costs will evolve across them if unemployment rises.

The key controllable variable is the base compensation level (X) in our model. We will both calculate this for a conservative and a 'popular' (following the survey) variant. In the conservative estimate, X is one peso above the urban poverty line of November 2021 (3.898+1 peso), while for ½ X we use 1950 peso, which is above the absolute urban poverty line of 1.879 peso. In the 'popular' variant, we take X to be the median of our survey (7000 peso).

Another key variable with be the time spend (Y), which is unpredictable as it depends on when the beneficiaries find work. We will first work with three ranges: an unrealistic minimum (all one month), a realistic middle (half of Y), and an unrealistic maximum (all take maximum time). It must be noted that although an exact number can't be given for Nuevo León (the data works with ranges, see INEGI, 2021), if we take the average of the ranges and round 'more than a year' down to 12 months, the average time would be slightly over 2.4 months. Given the policy pays per month, it would thus be in line with our 'realistic' middle of 3 months for tier one.

For the initial calculation of the tiers, we will first use the third trimester of 2021 unemployment rate of 4.619% (reflecting the pandemic), or 132.416 people for tier 1 of the model (0-5% unemployment) and take a middle number of 7.5% for tier two (5-10%), and 17.5% for tier 3 (10-25%). In a later calculation more intervals will be given.

The last estimation is of the number of clients. Due to lack of data, we must start from the unrealistic assumption that all are eligible (and not quit voluntarily or committed fraud). Even in this scenario, not everyone would apply to this policy. Given there is no national president, we will take the unemployment take up rate of 73% of the U.S. (Auray, Fuller, 2020).

For Tier one this results in 96.663 beneficiaries, likely a large overestimation of the roll-out costs of the program in NL (Mexico City budgeted this for 4.8%), since this program has existed for decades in the U.S. The calculation for tier one is in table 2.

Table 2.
Cost calculation of first tier

Base amount	Min time (1 month)	Mid time (3 months)	Max time (6 months)
Conservative: 3899	376.889.037 $	1.130.667.111 $	2.261.334.222 $
Popular: 7000	676.641.000 $	2.029.923.000 $	4.059.846.000 $

Own elaboration (2021).

In tier two, there are more beneficiaries (156.956) and larger timespans, but the payment becomes regressive to around half the original number. This can best be done percentage wise to even out the relative loss as time goes on and people have less savings. If we take a 0.06 percentage change per month, for a conservative payment that means a regression from 3899 to 1974 over 12 months: and for the popular variant from 7000 to 3544 over 12 months. This creates the following cost calculation rounded for readability to 1 peso, see table 3.

Table 4.
Cost calculation second tier.

Base amount	Min time (1 month)	Mid time (6 months)	Max time (12 months)
Conservative: 3899	611.971.444 $	3.163.178.216 $	5.345.356.318 $
Popular: 7000	1.098.692.000 $	5.678.956.879 $	9.596.694.786 $

Own elaboration (2021).

The calculation for tier three is like the first one and starts from half the original payment given to 366.230 people. Our middle time range is likely an overestimation, as the duration of unemployment does not necessarily increase at the same rate as its volume (table 4). See table 5:

Table 5.
Cost calculation third tier

Base amount	Min time (1 month)	Mid time (12 months)	Max time (24 months)
Conservative: 1950	714.148.500 $	8.569.782.000 $	17.139.564.000 $
Popular: 3500	1.281.805.000 $	15.381.660.000 $	30.763.320.000 $

Own elaboration (2021).

Having established the basic functioning of each tier, we can now show the variation of two uncontrollable variables: unemployment rate and take-up rate, which allows us the see how the adaptive model controls costs. For the second we will add a version with a 50% take up rate which is representative for an implementation scenario. In the following calculation we will only include the 'realistic' duration variable, using 3 months for tier one, and using two ranges in tier II (3-6 months) and III (6-12 months), as we are uncertain how much the average duration would increase. Table 6 will show the rounded conservative (3899-peso base) cost at 1% intervals of the unemployment rate, using the population of the unemployment numbers for the third semester of 2021 (INEGI, 2021) as a base with 1% representing 28668 people.

Table 6.
Evolution annual costs. Tier I in green, Tier II in orange, Tier III in red.

Unemployment	Annual cost at 73% take up rate	Annual cost at 50% take up rate
2 %	489.577.935	335.329.596
3 %	734.371.815	502.994.394
4 %	979.167.567	670.659.192
5 %	1.151.981.716 - 2.018.798.913	789.030.081 - 1.444.385.578
6 %	1.382.382.463 - 2.530.566.756	946.836.097 - 1.733.262.693
7 %	1.612.772.201 - 2.952.314.447	1.104.642.113 - 2.022.139.809
8 %	1.843.172.947 - 3.374.082.291	1.262.448.129 - 2.311.016.924
9 %	2.073.573.694 - 3.797.865.463	1.420.254.145 - 2.599.894.040
10 %	2.448.529.200 - 4.897.058.400	1.677.078.000 - 3.354.156.000
11 %	2.693.386.800 - 5.386.773.600	1.844.785.800 - 3.689.571.600
12 %	2.938.244.400 - 5.876.488.800	2.012.493.600 - 4.024.987.200
13 %	3.183.090.300 - 6.366.180.600	2.180.201.400 - 4.360.402.800
14 %	3.427.947.900 - 6.855.895.800	2.347.909.200 - 4.695.818.400
15 %	3.672.805.500 - 7.345.611.000	2.515.617.000 - 5.031.234.000

Own elaboration (2021)

This analysis shows us that the adaptability of the model offers a relatively smooth increase in costs when unemployment rises, while allowing more people to stay in the program for a longer period. Notice the jump between tiers from 9 to 10 percent. The cost for a six-month average unemployment (second range of 9% and first of 10% onwards) drops until 13% unemployment. This also shows how in the conservative variant the objective of the policy changes from poverty prevention to survival, with is avoided in the popular variant.

5. - CONCLUSIONS

This paper explored the feasibility of unemployment insurance in Nuevo León in the context of new societal challenges such a robotization, using a mixture of literature study, a survey and cost calculation. Our general conclusion is that UI is politically feasible, given the policy design and marketing are adapted to the context. This requires a design that protects from poverty while keeping costs and administrative complexity manageable, while positioning the policy in a way that captures popular support. We proposed a model of UI that is adaptable to the labor market, offering a relatively smooth cost transition while helping increasing numbers of people.

Exact costs are hard to estimate due to many variables as well as incomplete data, and are likely to err towards over estimation, given the assumed high rates of take up and full eligibility. Still, our conservative estimation is that if our conservative model was implemented during the pandemic (4-5% unemployment) it would have an annual cost of around one billion pesos. It could operate at roughly half of that cost under favorable economic conditions. If the unemployment rate would double, that cost would go up to roughly three billion pesos while helping people for a much longer duration. The policy does lose much of its protective capacity as the crisis increases, with the alternative of a more generous model, that would have a cost of roughly two billion pesos during the recent pandemic crisis operating at full capacity.

To further the discussion more research would be required. New surveys that capture public sentiment after the Covid19 experience would complete the understanding of popular support. The cost calculation would also benefit from more accurate estimates regarding the duration of unemployment in escalated scenarios, as well as of benefits and pay-back effects. Finally, depending on how political actors estimate the feasibility of different funding options and more accurate data on the state's finances after the current crisis, the fiscal consequences of this policy could be estimated. While the costs are manageable, some form of additional tax is likely needed.

To conclude, our analysis leads us to believe that the adaptation of unemployment insurance is due, and new societal challenges both provide the need and opportunity to politicize this issue. While a federal rollout would be preferable and fill a gap in the social policy landscape, state level implementation in the industrial context of Nuevo León is feasible. However, we must be aware that its function is to protect against short-term social degradation, not to tackle the root causes of a precarious labor market. In the case of robotization, unemployment insurance offers a realistic but incomplete solution, and is best envisioned as part of a

broader response (see Ghys et al., 2021). Additionally, like most social security programs this still assumes formal unemployment, which limits its redistributive effect.

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