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The impact of the COVID-19 pandemic on women's welfare and domestic burdens in Bolivia

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The impact of the COVID-19 pandemic on women's welfare and domestic burdens in Bolivia

Abstract

The coronavirus pandemic (Covid-19) is threatening the well-being of citizens in most countries of the world, however women and men could be affected in different ways. This study uses a gender-sensitive computable general equilibrium model linked to a micro model to assess the impacts of the Covid-19 pandemic on poverty and inequality in Bolivia. This paper simulates both a moderate and severe scenario, to represent the pandemic. The results reveal negative effects for all economic agents that worsen in proportion to the severity of the scenario. In addition, female-headed households in general and those headed by unskilled women in particular are the most affected, as they experience significant reductions in employment and the largest increases in household burdens. This is due to the significant presence of female labour in the sectors most affected by Covid-19. Likewise, both simulations lead to increases in poverty and inequality, with women being more affected than men, mainly under the severe scenario, which ultimately results in Bolivian women becoming a highly vulnerable group.

Keywords: Covid-19, General equilibrium model, Gender, Domestic work, Poverty, Bolivia

JEL: C68, E60, J16, J22, O54

1. Introduction

The Coronavirus (Covid-19) pandemic was an unexpected outbreak that is disproportionately affecting the world's most fragile economies (Sayeh and Chami, 2020). In Latin American countries, the epidemic threatens to wipe out much of the progress made in recent decades in terms of poverty reduction, economic growth, and gender equality. Like most countries in the world, Bolivia adopted measures such as social distancing and economic lockdowns to prevent the transmission and spread of the Covid-19 virus through the population from late March 2020. A total quarantine was thus declared through the Supreme Decree No. 4199¹, which was characterised by an initial 14-day national lockdown starting at midnight on the 22nd of March 2020. This strict quarantine was periodically extended² to prevent the further spread of the virus until the 10th of May 2020, and thereafter a "dynamic quarantine" was maintained, allowing for the gradual relaxation of the containment measures, mainly in those Bolivian regions and cities less affected by the virus. The amendments outlined contained measures relating to: a) closure of air, land, river and lake borders; b) suspension of international flights; c) temporary suspension of all on-site classes; d) suspension of public events, cultural and sporting activities, and all types of meetings that generate crowds; e) restrictions on the movement of people and goods;. At the end of August 2020, through the Supreme Decree No. 4314, the Bolivian government began the post-confinement phase and started to open up the economy, although this was to be done gradually.

The measures adopted during the period of confinement, as well as the measures adopted in the post-confinement period to protect the health of the population against the global pandemic, affected the normal development of the Bolivian economy, which had to disrupt or decrease its productive capacities. In the second quarter of 2020, Bolivia's Gross Domestic Product (GDP) shrank by 11.11%, becoming one of the most affected economies in Latin America (INE, 2020). It is also likely that these measures have had negative effects on household welfare. During shocks, vulnerable groups are often more affected, and among them, women are particularly hit. Indeed, the fact that the Bolivian economy already showed significant gender disparities, mainly in the labour market before the occurrence of the Covid-19 pandemic may cause women and men to be affected differently, depending on their initial situation. If this is the case, important achievements such as the decline in poverty which was significantly reduced from 59.6% of the population in 2005 to 34.6% of the population in 2018 (WDI, 2018), as well as the downward trend observed in inequality, reflected in the Gini index value, which had declined from 0.61 in 2000 to 0.42 in 2018, may be under threat.

A fundamental aspect of understanding the gender gap in Bolivia, is that it can be observed across multiple dimensions such as poverty, access to employment, and income level, amongst others. For example, poverty is not evenly distributed among men and women. Prior to the quarantine, women experienced a higher national poverty rate than

¹ The Supreme Decree (D.S. No. 4199) was presented on the 21nd of March 2020 with the aim of declaring a total quarantine over the whole Bolivian territory.

² The quarantine was first extended until the 15th of April (D.S. No. 4200), then again until the 30th of April (D.S. No. 4214), and then finally until the 10th of May (D.S. No. 4229). After this date, the "conditioned and dynamic" quarantine phase came into force. It was implemented until the 31st of May and extended up to the 31st of August 2020.

men (37.6% vs 36.7%, (INE, 2019)). Furthermore, in rural areas, women experience the highest rates of poverty in the country (51.6%) (INE, 2019). Gender inequality is even more visible in the labour market, especially when taking into account both paid and unpaid activities.

On the one hand, in the formal market (which includes paid activities), women's labour force participation rate in the 15-64 age group, is far lower than that of men (65.2 % versus 82.6 %) (WDI, 2019). Moreover, women work in a narrow range of sectors. Accommodation and food services, education, health and social services, and private domestic activities are the most intensive sectors for women (INE, 2018a). The fact that women are mainly employed in the service sector puts them in a more vulnerable position, especially if the service sector is affected. In fact, the five main service activities in Bolivia account for approximately 60% of total female employment compared to 25% of total male employment (INE, 2018a). Additionally, women are much more likely than men to be employed in jobs designated as vulnerable by the World Bank (69.7% compared to 58.7%) (WDI, 2018).

On the other hand, in the non-commercial sphere, unpaid work is mostly carried out by women, especially in developing countries (Rubiano-Matulevich and Viollaz, 2019). In Bolivia, unpaid work mainly consists of domestic chores, which is mainly carried out by women. In fact, women devote 5,6 hours per day to unpaid domestic and care work, while men devote only 3 hours per day (CEPAL, 2019). In addition, the gendered division of domestic labour is more pronounced in rural areas, where women spend seven hours per day doing domestic work compared to 1.4 hours for men (Ashwill et al., 2011).

Due to the existence of gender disparities in the commercial and non-commercial spheres, there is a significant income gap between sexes, with women being paid less than men. Although the gender gap in labour income has narrowed in recent decades, it still exists, with gender gaps remaining significant among the least educated proportion of the population, (Urquidi et al., 2020). In the context of the current pandemic, existing inequalities, such as the labour market participation rate and labour income, which are already unfavourable to Bolivian women, could be further exacerbated as economic sectors are not all equally affected. In Latin American countries, the economic sectors most affected by the Covid-19 pandemic are wholesale and retail trade, community, social and personal activities, hotels and restaurants, real estate, business and rental activities and manufacturing. While the sectors dedicated to essential activities such as health, medical equipment, agriculture and livestock, are the least affected (CEPAL, 2020a).

Some studies dealing with the impacts of Covid-19 in various countries have reported particularly negative effects on women's employment. Casale and Posel (2021), found that not were more South African women losing their jobs compared to men, but that more women than men had their working hours reduced. In Argentina, women have fewer opportunities to telework compared to men. This is because the participation of women is higher than men in the service-related sectors and in social services in particular, which makes it more difficult for them to perform these jobs remotely (Albrieu, 2020). In Bolivia, the impact of the pandemic on employment has hit women harder than men, leaving 47% of women unemployed compared to 39% of men (Gutiérrez et al.,

2020). These dis-proportionate impacts may amplify pre-existing gender inequalities and harm the most vulnerable, In Peru, for example, the income gap between men and women has widened as a result of the pandemic, with the poor being the most affected (Jaramillo and Ñopo, 2020). In the United States and the United Kingdom, the least educated women are those who suffer most from the consequences of the pandemic (Adams-Prassl et al., 2020).

The effects of Covid-19 are also visible in the non-commercial sphere of the Bolivian economy, as household and care work, carried out mainly on women, is likely to increase further, generating longer working hours for them. Women are more likely to be overburdened if they work remotely, as they take on more caring tasks for family members and more household responsibilities when they are at home (Weller, 2020). Traditionally, women care for children and the elderly and are therefore susceptible to infection and falling ill (Casale and Posel, 2021; Kapur, 2020). In addition, the increase in the number of sick people, combined with measures such as social isolation and school closures, leads to an increase in unpaid work in the non-commercial sphere, overburdening women (Wanderley et al., 2020). Not only is there an increase in the burden of unpaid work borne by women, but this additional work leaves them with less time for paid work in the formal sector. Apart from the economic effects already mentioned, evidence is emerging that Bolivian women may suffer from additional effects from the Covid-19 pandemic. For example, during quarantine, the number of cases of domestic violence against women increased considerably (Aponte et al., 2020). In addition, women showed higher levels of depression, anxiety, stress and psychological suffering compared to men (Losantos et al., 2020). Therefore, the negative effects of Covid-19, both in the commercial and non-commercial spheres of the economy, as well as the non-economic effects, could further reduce the economic potential and well-being of Bolivian women, leaving them even more precarious and vulnerable compared to men than beforehand.

In this regard, a gender focus needs to be integrated into these studies, to contribute to the development of appropriate policy responses and to help mitigate the effects of pandemics such as Covid-19 (Smith, 2019; Wenham et al., 2020). In South Africa, Chitiga et al. (2020) find that the Covid-19 lockdown increased poverty more amongst women than men. Unfortunately, little is known apart from this study concerning the economic impacts of Covid-19 on gender equality, although the facts suggest that the impact of the pandemic will affect women and men differently. In addition, taking gender into account in these studies is essential to ensure that existing inequalities are not worsened, as was the case with previous epidemics (Lozano and García-Calvente, 2020). For instance, during the Ebola crisis, women were more affected than men even after the outbreak, as they experienced higher unemployment rates (Burki, 2020). During previous epidemics, such as those caused by the Ebola and Zika viruses, women were more likely to be infected, because of their leading role in family care. However, their needs were not included in the crisis decision-making responses (Davies and Bennett, 2016). The same authors also reviewed recent disease outbreaks that occurred between 2014 and 2016, and reported that only 1% of the publications focused on gender impacts.

This paper addresses to some extent the lack of gender-focused macroeconomic research in the face of a pandemic. More specifically, we developed a gender-sensitive

Computable General Equilibrium (CGE) model, linked to a microsimulation module to evaluate the impacts of Covid-19 shocks on poverty and inequality in Bolivia. Following Fontana and Wood (2000) and Fofana et al (2003), the model also incorporates household domestic tasks, which for Bolivia and in the current context of the Covid-19 pandemic is a key element (ONU, 2020), often overlooked in the literature.

2. Methodological framework and data

2.1. The CGE model

In order to evaluate the impacts of Covid-19 in Bolivia, we use a static CGE model linked to a micro-model to assess the redistributive impacts on poverty and inequality. The choice of a general equilibrium model is relevant because it allows us to carry out a comprehensive analysis of the pandemic across the economy as a whole, while taking into account existing inter-sectoral links. In addition, these models are capable of capturing the relationships that exist between various segments of the economy (production, factors of production, exports and imports) and are the appropriate tools for capturing the direct and indirect impacts induced by Covid-19 (Laborde et al., 2020; Maliszewska et al., 2020). For instance, these models can capture shocks coming from the rest of the world and transmit them to the national economy, while also capturing impacts on domestic agents (households, firms, and government).

The model we use is based on the PEP 1-1 model by Decaluwé et al. (2013) and modifies several assumptions to represent the Bolivian context. The model incorporates classical features of the general equilibrium. The production function of technology assumes constant returns to scale and producers have the possibility to sell their products on the local market or on the international market (export) depending on the prices. Production follows a Leontief-type function, between value added and intermediate consumption at the top level and for each activity, then we break down the value-added component into two production factors (composite labour and composite capital) which can substitute each other following a Constant Elasticity of Substitution (CES) type function. Composite labour is a CES function between skilled and unskilled and at the second level and for each skill category, we consider a CES function between female and male workers. of male labour and female labour.

In addition, we used lower elasticities of substitution, of the order of 0.2. This implies, that labour according to skill and gender cannot be easily exchanged and illustrates a gender specialisation or gender division of the labour market in Bolivia. Furthermore, in contrast to the classical models where the labour supply is exogenous and following Fontana and Wood (2000) and Fofana et al. (2003), we assume an endogenous labour supply that incorporates a gender dimension and a time constraint that depends not only on the amount of time that households devote to their formal market activities, but also to their domestic activities. It means that men and women, whether skilled or unskilled, divide their time between market activities in the formal sphere and domestic activities like taking care of the children, cooking or fetching water. Technically, the total available labour supply in the CGE model is determined by households and presents a matching between the different types of labour through CET-type of functions at three levels. Firstly, between the formal labour market and the domestic labour market. Secondly and for each labour market, supply functions are also adapted according to the

skill level (skilled and unskilled). Finally, at the third level, according to gender. It should be noted that it is considered difficult to transform or replace both skilled and unskilled workers, as well as men and women within each skill level, so the transformation elasticity is set at 0.5 at all levels.

In order to determine the amount of time spent performing household tasks in Bolivia according to gender and skill level, time-use surveys were used. Canelas and Salazar (2014) and Lundvall et al. (2015) found that women spend up to 4 times more time doing domestic duties than their male counterparts in LAC countries. To complete the allocation estimates on the use of time and given to the absence of disaggregated data per level of qualification in Bolivia, we used estimates for Peru from Rubiano-Matulevich and Viollaz (2019). Based on these studies, it was estimated that skilled women allocate four and a half hours on a daily basis doing domestic work, compared to one and a half hours for skilled men. While unskilled women allocate seven hours per day on domestic chores compared to three hours for unskilled men.

In line with the Social Accounting Matrix (SAM), the model has 20 activities/commodities, and distinguishes four different institutions: households, firms, the government and the rest of the world. Households are disaggregated according to their location (rural and urban areas) and according to the gender of household head (male and female), making a total of 4 household categories. For all categories of households, the model distinguishes three different sources of income: labour income, capital income and transfers from other agents. In male-headed households, income from labour is the main source of income (89% and 84% in rural and urban areas, respectively). In female-headed households, income from labour is also the main source of revenue, but to a lesser extent than that of male-headed households (77% and 75% in both rural and urban areas respectively). Transfers also constitute an important part of household income, especially in female-headed households where transfers account for 22% and 23% of total income in both rural and urban areas respectively, while in male-headed households, transfers account for only 10% and 13% of income in those same areas, respectively. It should be noted that remittances are the main source of income from transfers, especially in female-headed households in rural areas, where remittances account for more than 60% of total transfers. Finally, households receive income from capital and land. Although this source accounts for the smallest share of total income, it should be noted that urban households receive the largest share. In fact, urban households receive more than 90% of this revenue. Households use their income mainly for consumption expenditure, to pay taxes and save the remaining income. There are some interesting differences in household expenditures from one household category to another. For instance, rural households spend a larger proportion of their income on final consumption compared to urban ones (92% vs 88%). Concerning household savings, which account for between 8% and 12.7% of total income, the highest proportion of savings was reported among urban households, with savings of 12.4% being made in male-headed households and of 12.7% in female-headed ones.

Firm's revenue is based on transfers from other institutions and mainly from capital income (96.54%). Companies pay income tax, dividends, transfers to other agents, and the remaining money constitutes savings.

Government revenue comes mainly from indirect taxes (import duties, commodity taxes and production taxes) which account for more than 50% of public revenues and collects direct taxes from households and firms. Government resources are used for public expenditure (mainly on non-tradable commodities), for the payment of transfers to non-governmental agents and the remainder constitutes its savings.

In terms of closure rules, we assume that the nominal exchange rate is the numeraire of the model. Bolivia is a small country and therefore, world prices are exogenous. The current account balance is assumed exogenous. Thirdly, capital migration across sectors is not permitted in the short term, while labour is mobile across the different sectors. Finally, government spending is assumed to be fixed.

Finally, although the CGE model allows us to evaluate the impacts of the Covid-19 pandemic on the well-being of economic agents and in particular that of households, it has limitations in determining the impacts on poverty and income equality. To address this, we have linked the macro CGE model with micro-simulations, using a top-down approach. This means that once the CGE model is run, changes in the income level and prices from the Covid-19 scenario are transmitted to the micro (top-down) module. More specifically, FGT indicators from Foster et al. (1984) are generated for poverty analysis and the Gini index for determining inequality.

2.2.Data

The main database used for the CGE model is the Social Accounting Matrix (SAM) by IFPRI et al. (2018). Together with the SAM, we use Armington elasticities from Sevillano Cordero (2012) and borrow income elasticity from Morales et al. (2017). Finally, for the microsimulation module, we use data from the National Household Survey (INE, 2018b).

3. Scenarios and key results

3.1. Scenarios:

The COVID-19 pandemic is affecting the Bolivian economy in many ways and through many channels, and as the pandemic is ongoing, it is difficult to assess real estimates for the magnitude of the shocks. Therefore, we design two scenarios, a moderate and a severe, that differ by the magnitude applied to the shocks. For both scenarios, we group the different impacts of the pandemic in two transmission channels (Domestic and International).

In the domestic channel, we identified two shocks. Firstly, due to the shutdown or reduction in production capacity in most sectors as a result of the pandemic, we simulated a decline in total factor productivity. In addition, as social restrictions forced most of the population to stay at home, the use of capital in factories was reduced, making economic activities even less productive. This decline in factor productivity has an impact on production in all sectors, although varying in magnitude from sector to sector. It is important to note that the effects of the pandemic are ongoing at this time. Therefore, in order to construct a reasonable scenario, we have used some existing studies and reports, in particular the study carried out by the CEPAL (2020) for Latin America, which

identifies three groups of sectors according to the magnitude of the effects of the crisis (strong, significant and mild). By adapting this sectoral classification, we established that the most important declines in productivity affected the hydrocarbon and mining industry, the commercial industry, services in general, and in particular, services related to the social and personal activities of the community and also hotels and restaurants. Secondly, the sectors moderately affected are the manufacturing, textiles, public administration and the water, gas and electricity sectors. Finally, the agricultural sector, livestock, and the processed food industry are considered to be only slightly affected, as these sectors produce essential commodities that continue to be sold during the quarantine period.

It should be noted that in the severe scenario, an additional 1% decline in total factor productivity is projected for those sectors considered to be moderately and strongly affected by the pandemic.

On the other hand, the domestic channel also includes a labour productivity shock. In fact, quarantine, forces workers to stop working completely or to work remotely from their homes, with the low-skilled workers being the most affected, since telework for the low-skilled is not always a viable option (Kerr and Thornton, 2020 for South Africa). In Latin America, only about 21.3% of the employed could telework. Particularly in Bolivia the probability of doing telework is only 15% (CEPAL, 2020b). Likewise, the same CEPAL report indicates that in most of the occupations that can be developed remotely, the workers have a higher level of education and, on average, receive higher salaries than those of the activities that cannot be done remotely. Moreover, being at home, workers are also exposed to heavy domestic workloads such as childcare and care of the elderly, which can eventually lead to excessive workloads. Based on these Bolivia-specific characteristics, and following Beverinotti et al. (2020) and Banerjee et al. (2020), we simulate, as a result of Covid-19, a decrease in labour productivity of approximately 4% in the moderate scenario and of 6% in the severe scenario.

Regarding international transmission channels, we have identified three shocks caused by Covid-19. Firstly, we expect Bolivia to face a decline in the global demand for its goods, as Bolivian exports are limited to a few products (gas, minerals, and soya) but also limited to a handful of markets. Indeed, regarding traditional exports, the main destinations are Brazil and Argentina for natural gas, and China for metals such as gold, zinc, lead and copper (ALADI, 2020). Meanwhile, Colombia and Peru are the main destinations of non-traditional exports of soya and its derivatives (IBCE, 2020a). All these trading partners have suffered from the current situation, as has Bolivia, from a kind of blockade that has ultimately led them to reduce their imports, including those from Bolivia. In the third quarter of 2020, Bolivian exports fell by 29% in value and 5% in volume compared to the same period in 2019 (IBCE, 2020b). To represent the shock of declining global demand for Bolivian exports, a moderate and a severe scenario have been designed (see for example Diaz-Cassou et al. (2020) for different economic scenarios for the Andean region of South America).

The severe scenario adds an assumption to the moderate scenario, whereby it will take longer for the global demand for traditional Bolivian exports (particularly

hydrocarbons, minerals and textiles) to recover. We model this hypothesis by introducing a 14% reduction of these exports in the severe scenario, while in the moderate scenario exports are reduced by between 9% and 12% depending on whether they are traditional or non-traditional products. Secondly, we take into account the drop of the oil price by including a shock on the decline of international oil and mineral prices, reducing them by 20% in both scenarios and in line with Chitiga et al. (2020). Finally, we include the third international shock through remittances, which according to the World Bank will be smaller as the pandemic continues. Indeed, remittances are expected to fall by about 20% in low- and middle-income countries (World Bank, 2020). In Bolivia, households receive a significant flow of remittances mainly from Spain, the United States and Chile. In these countries, the pandemic and the economic downturn were quite severe, reducing the amount of remittances sent abroad. According to the Central Bank of Bolivia, the flow of remittances in the first quarter of 2020 declined by 28% compared to the same period in 2019 (BCB, 2020). Table 1 summarizes both the moderate and severe scenarios that were designed to represent the pandemic in Bolivia.

Table 1: Summary of the moderate and severe scenarios designed to represent the pandemic in Bolivia

| TRANSMISSION CHANNEL | MODERATE SCENARIO | SEVERE SCENARIO |
|--|--|--|
| Domestic channels | | |
| Decrease in productivity for the sectors | -3% for slightly impacted | -3% for slightly impacted |
| | -7% for moderately impacted | -8% for moderately impacted |
| | -11% for largely impacted | -12% for largely impacted |
| Decrease in labour productivity | -4% for formal labour | -6% for formal labour |
| International channels | | |
| Decrease in exports | -12% for hydrocarbon and mineral exports | -14% for hydrocarbon and mineral exports |
| | -12% for textile exports | -14% for textile exports |
| | -9% for other non-traditional exports | -9% for other non-traditional exports |
| Decrease in world prices | -20% for oil and minerals | -20% for oil and minerals |
| Decrease in remittances | -20% | -20% |

3.2. Macroeconomic and sectoral results

Given that the Bolivian economy is simultaneously affected by demand and supply through both domestic and international channels under the Covid-19 scenarios, the Bolivian economy is expected to suffer as a whole.

The macroeconomic impacts of the Covid-19 pandemic are very negative. In fact, economic sectors have become less productive due to the various economic blockade measures (first lockdown, then application of social distancing rules...). Then, there is a

drop in exports demand. This will particularly affect the hydrocarbon, soybean and textile sectors that are exports oriented. Both phenomenon lead to a decline in total production that leads to a fall in total demand for labour. As a result, employment declines by 3.77% in the moderate scenario and by 5.73% in the severe scenario. In addition, workers are less productive, especially the low-skilled, as is not always possible to work properly when working from home and even more so, when workers undertake household tasks at the same time. This leads to the release of workers into the labour market, causing a drop in wage rates. Wage rates however decline slightly more for unskilled workers compared to skilled ones. As for the capital rental rate, it also decreases in most sectors due to lower capital use. With declining wage rates, household labour income (the main source of household income) is negatively affected, and because remittances (the main source of transfer income, especially in female-headed households) are also declining in both scenarios, the impact on total income, and hence on household consumption is considerable. The results reveal a decline in final consumption, with female-headed households experiencing greater contractions than male-headed ones, mainly under the severe scenario. In summary, the combined effects explained above, lead to a reduction in real GDP of 11.04% in the moderate scenario and 13.10% in the severe scenario (see table 2).

Table 2 – Impact on Macro Results (in % difference to base)

| | MODERATE | SEVERE |
|---|-----------------|---------------|
| Real GDP at basic prices | -11,04 | -13,10 |
| Consumer price index | -1,27 | -5,65 |
| Real consumption of Male-headed households | -6,25 | -7,63 |
| Real consumption of Female-headed households | -7,05 | -8,22 |
| Total investment expenditures | -37,88 | -59,64 |
| Employment | -3,77 | -5,73 |

Source: Calculations based on the CGE model

While the results indicate a decline in total output, the effects are not evenly distributed across sectors. Indeed, depending on whether or not they are characterized as being strongly affected or not, and whether they are the sectors are exports-oriented or not. Thus, the mining and hydrocarbon sectors, along with soybean production, which accounts for the bulk of exports, have directly experienced significant declines in production, despite the fact that soybean production was initially considered an essential activity, being only slightly impacted by Covid-19. Likewise, the sectors identified as being heavily affected, have experienced considerable declines in production, leading to redundancies and forcing the sectors to reduce their consumption of intermediate inputs. This effect eventually spills over to the other sectors that become indirectly affected and production falls for all sectors. The indirect effects on the economy are important because they indicate that some of the sectors that had not been classified as severely affected before the pandemic are now strongly affected. The most striking example of this occurs in the water, gas and electricity sector which was initially classified as being only moderately affected, but becomes indirectly affected by the decline in activity in the hydrocarbons and manufacturing sectors in general, causing it to register losses of slightly over 20% in the severe scenario, making it the most affected sector in Bolivia. In addition to this, we can identify another four sectors that are severely affected by the pandemic,

with decreases in production exceeding 10%. In first position we have the commercial and financial sector, where production declines by 15% in the moderate scenario and by 20% in the severe scenario. In second place are community and social services, which register declines of 12% and 14% in production for the same scenarios. Finally, we identify two industries: the machinery industry, and the hydrocarbon and mining industry, with production declining by between 11% and 13% depending on the severity of the scenario. The dramatic declines of production in these sectors can be explained by two things. Firstly, for the machinery industry, the hydrocarbon and mining sector and the commercial and financial service sector, which represent more than 85% of total investment, it is the fall in the investment budget that leads to the pronounced crisis. Indeed this decline in investment is caused by the sharp fall in the income and savings of all agents. This will be further explained in section 3.4. Secondly, as far as the services sector and social services are concerned, it is the fact that they have been heavily impacted and the difficulty of the work being performed remotely leads to a deep crisis. These sectors are female labour-intensive and so women are expected to suffer much more than men.

And lastly, in the agricultural and livestock sectors as well as in the food industry, production declined by between 3 and 7% in the moderate scenario and by 4-8% in the severe scenario, despite the fact that they were identified as being essential sectors and only slightly affected. Similarly, modern crops and soybean production in particular have been the most affected, with declines of 7.3% and 7.4% occurring in both the moderate and severe scenarios, respectively. This can be explained by the fact that soybean is the second most important export product after hydrocarbons and minerals, and therefore external shocks, particularly the decline in global demand for Bolivian exports has had a more drastic impact on its production due to lack of demand.

3.3. Employment results by gender

As explained earlier in section 3.2, the results reveal negative impacts on employment, resulting in lower labour market participation rates. The labour market outcomes are slightly more negative for women than for men due to the fact that the female-labour intensive sectors have been the most impacted. Such is the case of the water, electricity and gas sector, which has been the worst affected sector of the economy and which employs more women than men (56% vs. 44%), as is also the case with the service sector, which account for almost 60% of total female employment and has also been severely impacted by the pandemic. These findings help to explain why women are more affected by losses in the formal employment sphere than men, which ultimately leads to heavier domestic burdens being borne by women. However, although women are more impacted than men, they are not impacted to the same extent. This depending on whether they are skilled or unskilled. Moreover, as households are in turn disaggregated according to location (rural and urban), the results show interesting variability.

Table 3 - Impact of Covid-19 on the female labour market according to skills and location (in % difference from base)

| FEMALE SKILL LEVEL | LOCATION | Moderate | | SEVERE | |
|--------------------|----------|----------|--------|----------|--------|
| | | Domestic | Formal | Domestic | Formal |
| Unskilled | Rural | 0,91 | -0,37 | 2,01 | -0,80 |
| | Urban | 0,91 | -0,47 | 1,87 | -0,97 |
| Skilled | Rural | -0,38 | 0,66 | -0,44 | 0,76 |
| | Urban | -1,10 | 0,54 | -1,16 | 0,57 |

Source: Calculations based on the CGE model

Note: Formal = Formal labour market, Domestic = Domestic labour market

Employment of unskilled women in the formal sphere shows the most significant decline. This decline is however more significant for the severe scenario, though slight increases in activity are observed for skilled women in this sphere, allowing them to slightly reduce their domestic burdens. This result suggests that only unskilled women bear the brunt of the losses in formal employment, resulting in higher domestic burdens for them.

Interestingly enough, losses in formal employment are slightly higher in urban areas than in rural ones. This particular result is explained by the fact that unskilled rural women tend to be more active in essential agricultural or livestock activities which have been less affected than service-related activities where unskilled urban women predominate. As a result, these losses in formal employment lead to higher household burdens for unskilled women, which increase according to the severity of the scenario. However, even though the losses of unskilled employment is higher in urban areas, rural women are more likely to be already involved in carrying out domestic work, meaning that the increase in domestic labour is greater in rural areas, especially with reference to the severe scenario (2.01% vs 1.87%).

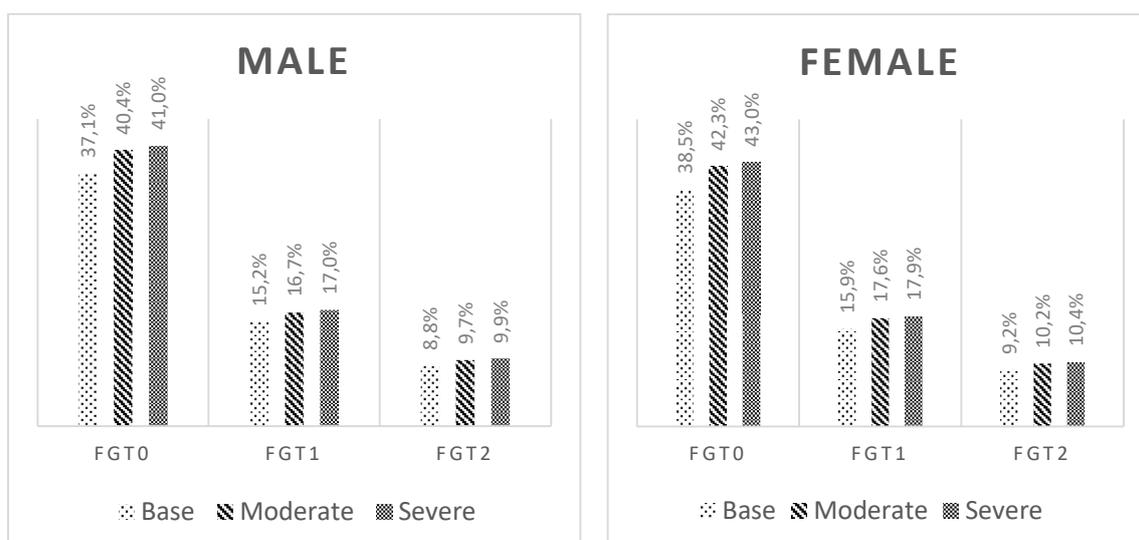
3.4. Impacts on agents, poverty and inequality

The effects of Covid-19 can be seen through the different economic actors in the Bolivian economy, namely firms, households and the government. All economic agents are negatively affected in both simulations, however the severe scenario is more damaging to them. The income of firms, which is mainly based on capital income, is affected by the sharp decline in the capital rental rate, resulting in decreases of slightly more than 20% in their income in both simulations. This decline in income, leads to a decrease in both savings and the amount of direct taxes paid. Households also face significant declines in income due to declining wage rates and declining income from capital and overseas remittances. Overall, male-headed households face a decrease in income of 7.44% and female-headed households a decline of 8.22% under the moderate scenario, and 12.86% versus 13.40% under the severe one respectively. Faced with this decline in income, households reduce their consumption levels, with female-headed households being the most affected (see table 2). And finally, government revenues are also declining as a result of lower direct taxation on households and firms, as well as lower revenues from indirect taxation. In total, government revenue declines by 15% under the moderate scenario compared to 25% under the severe one. This decline in public revenue and fixed

expenditures leads to a massive increase in the current public deficit, which was already a matter of concern before the pandemic.

In order to assess the impact of both Covid-19 scenarios on the evolution of poverty in Bolivia, we use the FGT indexes from Foster et al. (1984). These were calculated for male and female-headed households before and after the pandemic. Figure 1 summarizes the impacts of Covid-19 on poverty according to gender type. From the baseline situation, we can already see that poverty rates are slightly higher among women than among men. However, the impacts of both Covid-19 scenarios not only increase poverty but also the gender-poverty gap. In fact, the poverty rate for women increases by 3.73 percentage points in the moderate scenario and by 4.47 percentage points in the severe scenario, while the poverty rates among men increase by only 3.33 and 3.96 percentage points depending on the severity of the scenario. 43% of female-headed households risk poverty under the severe scenario. In addition, the results also indicate the widening of the gender poverty gap through the FGT1 indicator, and the increase in the severity of poverty through the FGT2 indicator. All this is particularly worrying for the most vulnerable groups including the poorest of women, who will be severely affected.

Figure 1– Impacts on poverty (in % difference from base)



Source: Calculations based on the Microsimulation model

Note: FGT0 is the poverty head count ratio; FGT1 is the poverty gap index and FGT2 is the depth of poverty.

With regard to inequality, we calculate a GINI index of 0.41 for the base scenario, however the inequality gap varies according to location, with rural areas recording higher levels of inequality, compared to urban ones (0.48 vs 0.38). With respect to this baseline situation, both simulations lead to increases in inequality, but inequality increases to a greater extent under the severe scenario than under the moderate one (0.26 vs 0.12 percentage points). Similarly, both simulations reveal that inequality in urban areas increases more than in rural ones, suggesting that the Covid-19 in Bolivia further exacerbates inequality in urban areas.

4. Conclusions and policy implications

The Covid-19 pandemic triggered a major global shock. In this paper, we investigate the economic and gender effects of Covid-19 in Bolivia, using a computable general equilibrium model. The results show that the Covid-19-induced trade blockade, the confinement measures taken by the government, as well as the external effects through international channels are having devastating effects on the Bolivian economy and population. Although there is a reduction in economic activity in all sectors under both scenarios, unskilled labour-intensive sectors as well as the sectors initially considered as being severely affected are the most impacted.

Given that economic activities are affected to different degrees, with female labour-intensive activities being the most affected, the gender-specific impacts on employment reveal that women suffer more than men from the negative impacts of the pandemic. Under both scenarios there is a decline in formal employment, leading to a significant increase in household burdens. In addition, unskilled workers, and unskilled women in particular, are the most affected, as they experience the greatest losses of formal employment and face much heavier household burdens. Ultimately, this suggests that Covid-19 may further widen existing gender gaps in the Bolivian labour market that were already prejudicial to Bolivian women. Due to the fact that female employment is severely impacted, means that they receive less labour income than their male counterparts and with the decline in the flow of remittances, which is the second largest source of income for Bolivian women, total income and consumption levels have declined considerably, with rural living women being the most affected. This pandemic also widens the poverty gender gap and increases inequalities, ultimately leaving women even more vulnerable than before. In fact under the severe Covid-19 scenario, increasing levels of poverty leaves more than 43% of female-headed households impoverished.

It should be noted that this study did not take into account any government fiscal stimulus or social transfer schemes. This is an important issue that should be examined in more detail within future studies. However, our results are important to help guide the Bolivian government towards taking appropriate measures in the context of Covid-19 while also taking into account the significant labour market disparities that exist and the consequences with regard to the feminisation of domestic work.

On a final note, it can be said that the findings of this paper provide far-reaching insights beyond Bolivia, mainly into other Latin American countries that have been equally affected by the pandemic through similar transmission channels and which like Bolivia have important gender disparities in the labour market and significant domestic strains in their economic structure, which deserve to be integrated into future macroeconomic studies.

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