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# How to Mitigate the Impact of Economic Downturns on Labor Markets?

Evidence from Nicaragua

Sandra Marcelino and Mariana Sans

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WORKING PAPER

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Western Hemisphere Department, Latin-Caribbean Division

**How to Mitigate the Impact of Economic Downturns on Labor Markets: Evidence from Nicaragua**  
**Prepared by Sandra Marcelino and Mariana Sans\***Authorized for distribution by Bas Bakker  
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**ABSTRACT:** This paper studies the drivers of the labor market performance in Nicaragua with a particular focus on informality, to identify vulnerable groups during economic downturns; and estimates the speed of adjustment of employment to shocks. The paper compares this experience with the ones in other CAPDR countries (Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, and Panama). Our findings are that while the high countercyclical informality in Nicaragua has been the active margin of adjustment during economic downturns mitigating unemployment, the trade-off has been a lower speed of adjustment to shocks hampering the country's ability to revert to its potential. Policy recommendations relate to mitigating the impact of downturns on employment in Nicaragua, easing adjustments and inequalities in the labor market to hasten the employment recovery and thus, support growth.

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WORKING PAPERS

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Evidence from Nicaragua

Prepared by Sandra Marcelino and Mariana Sans<sup>1</sup>

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<sup>1</sup> The views expressed in this paper are those of the authors and do not necessarily represent those of the Central Bank of Nicaragua, the International Monetary Fund, its Board or Management. We thank the Research Department of the Central bank of Nicaragua for their collaboration, Samuel Pienknagura for sharing data and codes, Bas Bakker, Mariya Brussevich, Alina Carare, Carlos van Hombbeck, and Chris Papageorgiou for helpful comments. All remaining errors are under the full responsibility of the authors.

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# I. Introduction

During 2018-2020, Nicaragua was hit by three shocks leading to a cumulative decline of real GDP of about 9 percent. Following social unrest in April 2018 the country entered a two-year economic contraction, followed by the pandemic, and two hurricanes in November 2020. Despite real GDP growth of 10.3 percent in 2021, Nicaragua still had 120,784 fewer jobs at end 2021 compared to end 2017. Accordingly, employment fell by 3.3 percent in this period, expanding a weakened labor contribution to growth that started earlier.

This paper studies the drivers of the labor market performance in Nicaragua in the context of CAPDR<sup>1</sup> countries, with a particular focus on informality; identifies vulnerable groups during economic downturns; and estimates the speed of adjustment of employment to shocks.

Building on the vast literature on informality and unemployment during business cycles, this paper follows the approach in David, Perez, Pienknagura and Roldos (WHD, REO 2019) and David, Lambert, and Toscani (2019), to analyze the labor market dynamics and informality over the business cycle in CAPDR. These papers find that countercyclical variations in informality explain, to a large extent, the low cyclical fluctuations in unemployment, or in other words, the role informality as a buffer against output fluctuations for Latina American and the Caribbean more broadly. WHD, REO (2019) also finds that high levels of informality reduce the speed of adjustment of the economy to shocks.

We test therefore whether these conclusions—if informality helps dampen fluctuations in unemployment over the business cycles and reduces the speed of adjustments to shocks—are valid in the case of Nicaragua and its regional peers. We use time series data for the period 1970-2021. In addition, like in David, Lambert, and Toscani (2019) we highlight the importance of the design in driving the success of reforms in improving labor market functioning for Nicaragua.

Our findings are that while the high countercyclical informality in Nicaragua has been the active margin of adjustment during economic downturns mitigating unemployment, the trade-off has been a lower speed of adjustment to shocks hampering the country's ability to revert to its potential. Policy recommendations to mitigate the impact of downturns on employment in Nicaragua, ease adjustments and inequalities in the labor market to hasten the employment recovery and thus, support growth should therefore focus on increasing formality gains, implementing structural reforms and protecting procyclical workers.

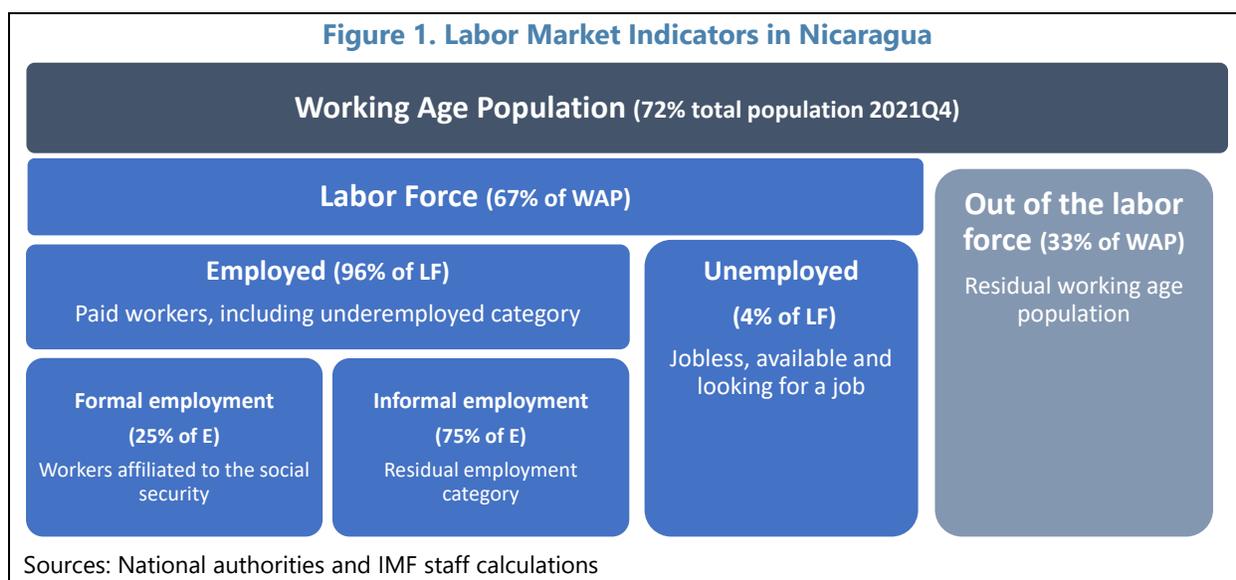
The structure of the paper is as follows. We start defining, in section II, the labor market variables and data used in this study. In section III, we take stock of the performance of the labor markets in Nicaragua to characterize and contextualize the subsequent analysis. At the aggregate level, the main labor market indicators in Nicaragua are in line with those in Guatemala, El Salvador, and Honduras, also known as the North Triangle (NT). However, Nicaragua stands out in the region for its high labor force participation rate, low and stable unemployment rate, high underemployment rate, and its large and countercyclical informal sector. To understand the cyclical behavior of the Nicaraguan labor market, in Section IV we decompose changes in unemployment, revisit the Okun's law estimates, explore the role of informality and labor force participation rates, and examine the speed of adjustment of employment to shocks and its relation to economic growth. In the final section of the study, we conclude and reflect on the role of informality in Nicaragua and provide specific policy recommendations to mitigate the impact of economic downturns on employment, which underpins macroeconomic performance.

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<sup>1</sup> CAPDR countries include Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua and Panama.

## II. Labor Market Indicators

In this study, we use the broad working age population definition, i.e., population of 15 years of age and older.<sup>2</sup> Working age population represents 72 percent of total population in Nicaragua in 2021 (Figure 1) and labor force represent people actively participating in the labor market, it constitutes 67 percent of the working age population. The labor force comprises the unemployed (4 percent of the labor force), defined as the jobless and those available and actively looking for a job, and the employed (96 percent of the labor force) comprised of paid workers, including the underemployed. In the last step we divide total employment into formal and informal employment. Formal employment refers to workers affiliated to the social security system (25 percent of employment; or 16 percent of working age population), whilst the residual constitutes the informal employment (75 percent of employment, or 49 percent of working age population).



We use the simple definition of informality, but as Loayza (2007) notes, its direct measurement is not, as it is a latent, unobservable variable. Given the data characteristics of the countries under study, as mentioned above, we rely on the data of workers who do not make social security contributions to approximate informality, a commonly used procedure in the literature.

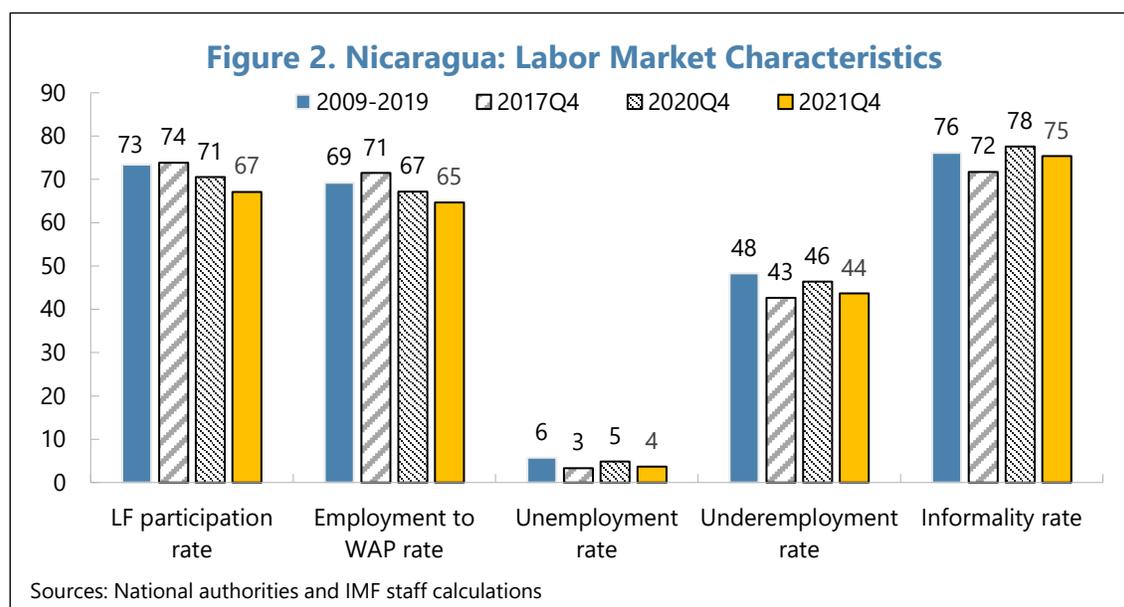
The data used in this paper consists of annual observations at the national level for Nicaragua and CAPDR countries, for the period 1970-2021 with a particular focus on the last decade thereby allowing us to explore cross-country and time-series dimensions. For labor market indicators, we use ILO modelled estimates that account for differences in national data coverage, collection, as well as for other country-specific factors. ILO data on Nicaragua's labor markets is not comprehensive so we relied on national statistics—the National Institute of Information on Development (INIDE) collects labor market indicators in its monthly household survey—to complement it. We use the WEO for national accounts data.

<sup>2</sup> According to the ILO dataset, "The working-age population is commonly defined as persons aged 15 years and older, but this varies from country to country". In Nicaragua, the working age population includes persons 14 years and older.

### III. Characterization of the Labor Markets in Nicaragua and CAPDR

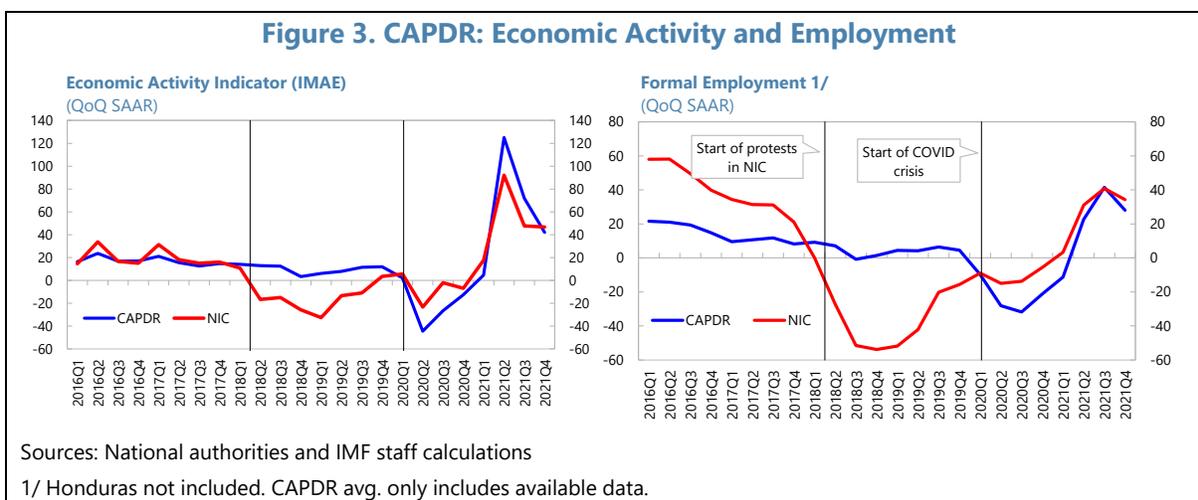
The labor market in Nicaragua is characterized by high labor force participation rates with low female participation, high informality rate, low unemployment, persistent underemployment, and flexible labor protection legislation. The country does not escape the reality of the region, in particular the NT peers: informality has been persistently high, and above 60 percent, there is a large gap between male and female labor force participation, and the unemployment rate,<sup>3</sup> albeit low, is quite rigid.

The last three years of recession has set Nicaragua back in the progress made in labor market outcomes during the 2009-19 period. By the end-2020, the informality rate stood above the average of the last 10 years, underemployment and unemployment rates climbed back up, and labor force participation was even lower than the average for that period. In 2021, while the rates of informality, unemployment and underemployment fell back owing to the strong economic recovery, the labor force participation rate continued to fall (Figure 2).



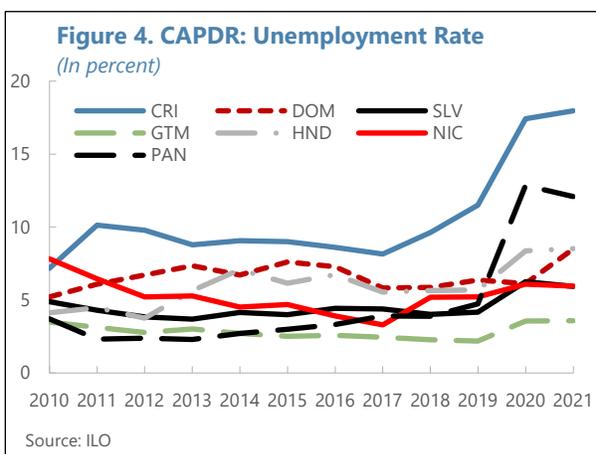
Amidst the COVID-19 shock, economic activity in the CAPDR region fell abruptly during the second quarter of 2020 (Figure 3). Although Nicaragua was not affected as much as its regional peers, mostly on the account that there has been no official lockdown during the pandemic, by the fourth quarter, its peers were recovering faster on average. Labor markets were severely disrupted, and formal employment suffered across countries. In Nicaragua, formal employment rebounded (Figure 3, right chart) yet it did not return to the level prior to the social protests of 2018 and the high jump in informal employment during this period relative to its peers seems to confirm the relevance of its countercyclical role against shocks.

<sup>3</sup> We use survey-based data, which captures total unemployment rate.



**Low and Stable Unemployment Rates**

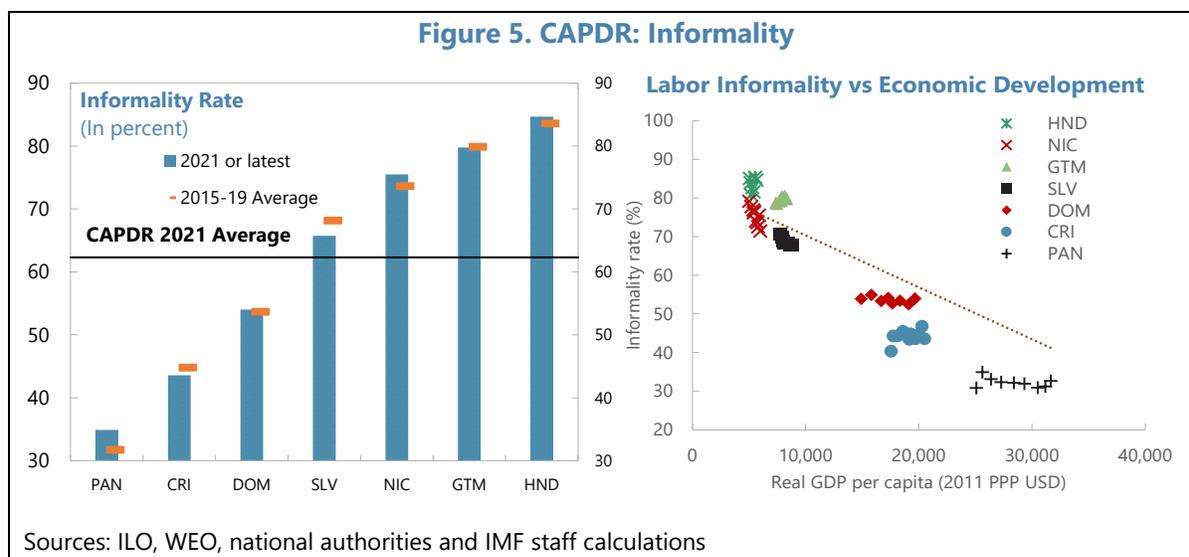
CAPDR countries have had a low and roughly stable unemployment rate throughout the last decade, despite the general increase triggered by the COVID-19 shock (Figure 4). In Nicaragua, the unemployment rate remained below the 8 percent mark supported by a favorable economic growth averaging 5.1 percent during the period 2010-2017, before the 2018 sociopolitical crisis and subsequent 2020 COVID-19 shock derailed economic performance. Although, unemployment increased from a low point of 3.3 percent in 2017 to 6.2 percent in 2018, it remained at a low level due to the transition of part of the labor force into informality which shows evidence in favor of the countercyclical role of informality, as indicated in the literature in Perry et al. (2007), Bosch et al. (2008), Leyva and Urrutia (2020a), among others.



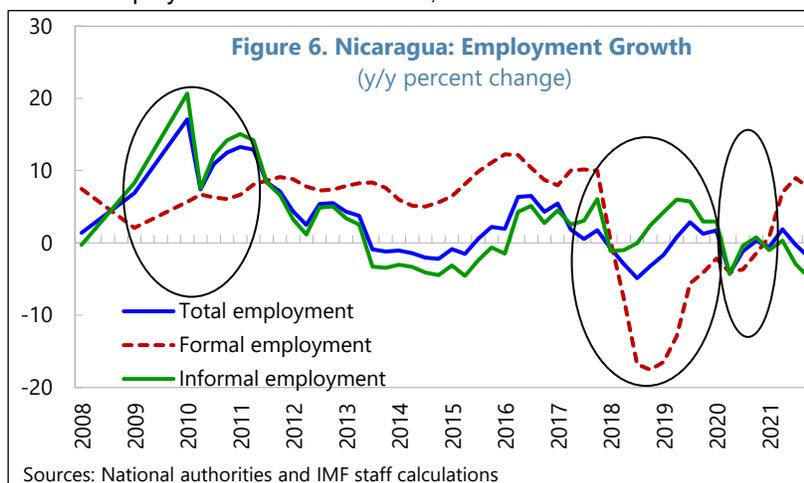
**High Informality**

In CAPDR informality accounts for over 60 percent of employment, but there are marked heterogeneities among countries driven to a large extent by the level of economic development and education of the labor force<sup>4</sup> (Figure 5). By end 2020, informality rate in Nicaragua reached 77 percent to fall back to 75.5 percent at end 2021, over 4 percentage points higher than 2017. While informality increase by 0.4 percentage points with respect to the 2015-2019 average in the CAPDR after the 2020 crisis, Nicaragua stood at 1.9 percentage points above that average.

<sup>4</sup> La Porta and Shleifer, 2014



The evidence of the role of informality in Nicaragua as a buffer to absorb formal workers following shocks supports the findings by the literature. However, we observe that in contrast to the Global Financial Crisis (GFC 2008-09) and the 2018 crisis, when informal employment acted as a buffer, and it declined much less than formal employment, at the onset of the 2020 COVID shock informal employment also declined almost as much as formal employment. This fact was also observed by Leyva and Urrutia (2020a) and Alvarez et al (2021), and could be probably attributed to the temporary closure of many businesses in the second quarter of 2020. Informal employment however rebounded faster than formal employment (Figure 6).



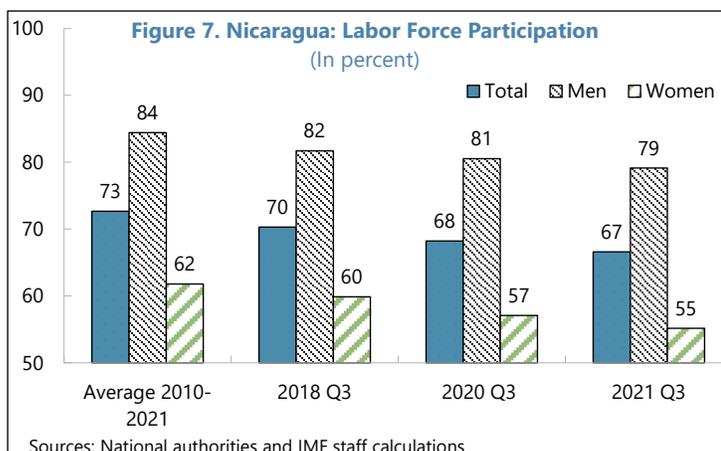
Brenes and Cruz (2016) and Hernández (2010) suggest that the historical high level of informality in Nicaragua is the result of its productive structure, specialization patterns and unfavorable insertion in international trade. Its productive matrix is concentrated in exportable agricultural products with low value-added that allow for the persistence of unproductive sectors and low technology adoption. These conditions do not generate the right incentives to formalize, hence informality remains prevalent in the rural sectors, low educated population, young workers, and women, generating a vicious circle.

Perry et al. (2007) also suggest that micro firms in Nicaragua, which have at most two employees and with high turnover, are largely prevalent in the country, and tend to be in the informal sector. These firms with small client base, typically rely on personal relations, have little potential to grow and hence the need for credit is marginal, so the benefits from formalizing labor are limited for them. As it seems the degree of formalization increases with the size of the firm, the prevalence of small firms in Nicaragua indicates that workers are mostly pushed into informality.

Leaving aside the long-run and fundamental causes of informality, Loayza and Rigolini (2006) state that in the short-run informality is a result of temporary conditions of the business cycle. This paper will thus focus on the short run dynamics of informal employment.

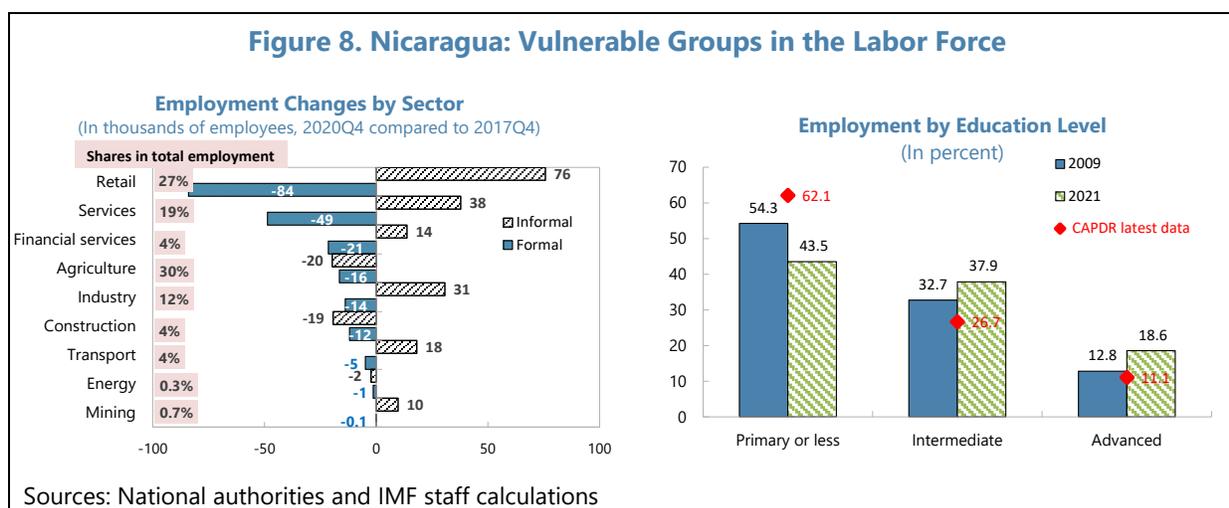
### High Labor Force Participation, Gender Disparities

Over the last decade, Nicaragua has had the highest labor force participation rates in the region. From 2010 to 2021, labor participation rate averaged 73 percent, higher than in any other CAPDR country. This high participation rate is explained on the one hand by the dominance of agriculture in economic activity, and on the other hand by a growing working-age population. However, there is a large gap in labor force participation rates as well as in labor force dropout rates between men and women (Figure 7). On average over the last decade, only 62 percent of working-age women are either working or looking for a job, in contrast to 84 percent of men. During the crisis period (2018-2020), almost twice as many women dropped out of the labor force relative to men, and without any recovery by end 2021.



Regardless of the gender impact, looking at employment by industry, the sectors most affected by the COVID-19 shock were those with the highest shares in total employment, namely agriculture, services, and retail (Figure 8). In the last two sectors, informal employment has also increased drastically relative to the pre-2018 crisis levels (from 71.4 percent in 2017 to 76.9 percent in 2020).

With respect to the education level of employment, the indicator has improved over time, and it remains high compared to peers (Figure 8). Indeed, the share of workers who completed at least an intermediate education increased from 45.6 percent in 2009 to 56.5 percent in 2021, compared to an average of 37.8 percent for CAPDR countries; albeit with large discrepancies across countries. Perry et al. (2007), La Porta et al. (2014) among others clearly suggests that the low level of education hinder transitions within the labor market.



## Flexibility of the Labor Market Institutions and Regulations

Labor market institutions and regulations are complex and multidimensional, hence not easy to describe. Table 1 below presents some selected indicators of the labor market regulations across CAPDR countries. In terms of wage flexibility, all CAPDR countries have a minimum wage, with Nicaragua being the country with the lowest rate (2.5 times less than Costa Rica and Panama) but night work and overtime are remunerated differently in the region. Nicaragua for example, does not necessarily require a premium for night work, but it does for overtime work. The ratio of the minimum wage to value added per worker shows how binding the minimum wage is, particularly for Honduras and Nicaragua. Regarding firing practices, Nicaragua is the most flexible in CAPDR if we consider that no notice is required for redundancy dismissal and the severance pay is the lowest. The 2019 Global Competitiveness Report<sup>5</sup> (GCI 2019) confirms this, and places Nicaragua as the most flexible in hiring practices in the region. Overall, according to the GCI 2019, Nicaragua is the country in the region amongst the most flexible labor market regulations and with the least active labor market policies.

**Table 1. CAPDR: Selected Labor Market Regulations**

Country	Minimum wage (US\$/month)	Ratio of minimum wage to value added per worker	Premium for night work (% of hourly pay)	Premium for overtime work (% of hourly pay)	Paid annual leave (in working days) <sup>1/</sup>	Notice period for redundancy dismissal (in weeks of salary) <sup>1/</sup>	Severance pay for redundancy dismissal (in weeks of salary) <sup>1/</sup>
Costa Rica	614.2	0.4	0	50	12	4.3	14.4
Dominican Republic	315.4	0.3	0	35	16.7	4	22.2
El Salvador	259.2	0.5	25	112.5	11	0	22.9
Guatemala	457.4	0.8	0	50	15	0	27.0
Honduras	505.7	1.7	25	37.5	16.7	7.2	23.1
Nicaragua	248.7	1.0	0	100	30	0	14.9
Panama	612.1	0.3	13	50	22	0	18.1

Source: World Bank Employing Workers indicators, 2020  
1/ For average of tenure.

## IV. Labor Market Dynamics and Speed of Adjustment

A flexible labor market is critical for the adjustment of the aggregate economy to shocks and thus for growth. The economic and social costs of shocks depend on a country's ability to (i) mitigate their immediate impacts and (ii) revert swiftly to its potential in the aftermath. The former is typically associated with the use of macroeconomic stabilization tools. The latter depends on the use of macro instruments and on the presence of microeconomic frictions that cause shocks to have protracted economic effects that amplify their welfare costs. For this reason, understanding the factors underpinning a country's speed of adjustment to shocks is crucial to assessing its macroeconomic performance.

<sup>5</sup> See WEF, The Global Competitiveness Report 2019

## Decomposing Changes in Unemployment

Over the last decade, Nicaragua registered a relatively stable unemployment rate, where formalization and participation rates adjusted for fluctuations in labor demand. This section follows David, Lambert, and Toscani (2019) approach to decompose changes in unemployment for CAPDR countries into different margins of adjustment on the supply and demand side relative to a reference period and is decomposed as follows:

$$u - u^* \approx -(l_F - l_F^*) + (f - f^*) + (part - part^*) + (wap - wap^*) \quad (1)$$

where  $u$  denotes the unemployment rate;  $part$  is the labor force participation rate;  $wap$  working-age population;  $l_F$  is the logarithm of formal employment and  $f$  is the logarithm of the ratio of formal to total employment (\* indicates the value of a variable at the beginning of the period). In this set-up, changes in labor supply are captured by changes in the participation rate and working age population, while changes in demand are reflected by changes in formality.

Overall, the decomposition shows the strong impact of the pandemic and hurricanes, in the case of Honduras, Nicaragua, and Guatemala (Figure 9). However, in Nicaragua the impact of these shocks in unemployment is limited relative to the other CAPDR countries, while the socio-political crisis in 2018 brought a larger increase in unemployment rate in the country.

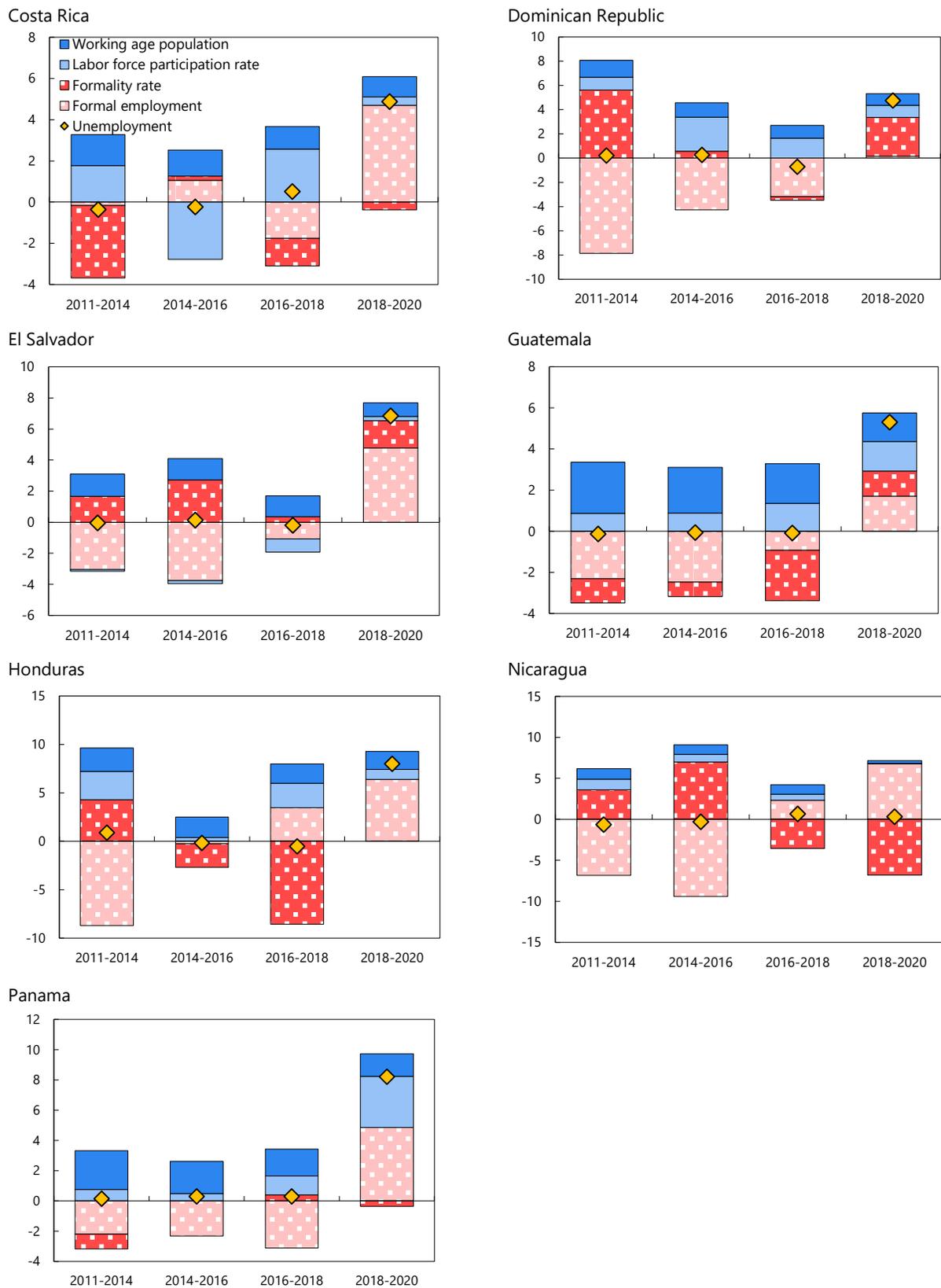
If we look at the margins of adjustment, on the supply side, working age population growth has been largely stable across countries and time-periods. The labor participation rate has been an active margin of adjustment, mitigating fluctuations in unemployment. In Nicaragua, it expanded during the good growth years, but stopped growing in the last three years of GDP contraction. In the region, participation rates played a similar role, and fell substantially in 2020, except for Panama which experienced the most severe GDP contraction of the region, resulting in both higher labor force participation and unemployment.

On the demand side, labor formalization has also played an important role in limiting movements in unemployment in the region. This is the case of Nicaragua, where informality fell during the economic expansion of 2010-2017, from a peak of 80 percent to 71 percent, and resumed its role as a shock absorber during the 2018-2020 crisis period and hence formality fell (informality rose). Similar counter-cyclical properties of informality can be observed in Panama and Costa Rica.

In 2018-20 in Dominican Republic, El Salvador, and Guatemala it is interesting to look at the lack of countercyclical adjustment along the informality margin – formality increased while unemployment rate also did. This could be related to the destruction of informal jobs in these countries during the COVID-19 shock, as these are usually more contact intensive and have less possibilities to telework.

This section reveals the limited fluctuations in unemployment over various phases of the business cycles, particularly in Nicaragua, while larger fluctuations in informality and participation rates. In the next section we will analyze a broader set of labor market outcomes to assess labor market performance in CAPDR.

**Figure 9. CAPDR: Unemployment Decomposition**



Source: IMF staff calculations

## Labor Markets and the Business Cycle

In this section, we use heterogeneous panel regressions and the common correlated effects (CCE) estimator proposed by Pesaran (2006)<sup>6</sup> to analyze variations of unemployment, informal employment, and labor force participation over the business cycle in CAPDR countries, following the approach used in WHD, REO (2019). This specification allows for country-specific slopes and captures possible cross-section dependence by including common factors in the estimation. We estimate equation 2 for  $i = 1, \dots, N$  countries; and  $t = 1, \dots, T$  time periods.

$$\begin{aligned}\Delta Z_{i,t} &= \beta_i \Delta y_{i,t} + \gamma_i \Delta y_{i,t-1} + \theta_i \Delta y_{i,t-2} + \mathcal{G}_{i,t} \\ \mathcal{G}_{i,t} &= \alpha_i + \sum_{m=1}^p \lambda_{i,m} f_{m,t} + \varepsilon_{i,t}\end{aligned}\tag{2}$$

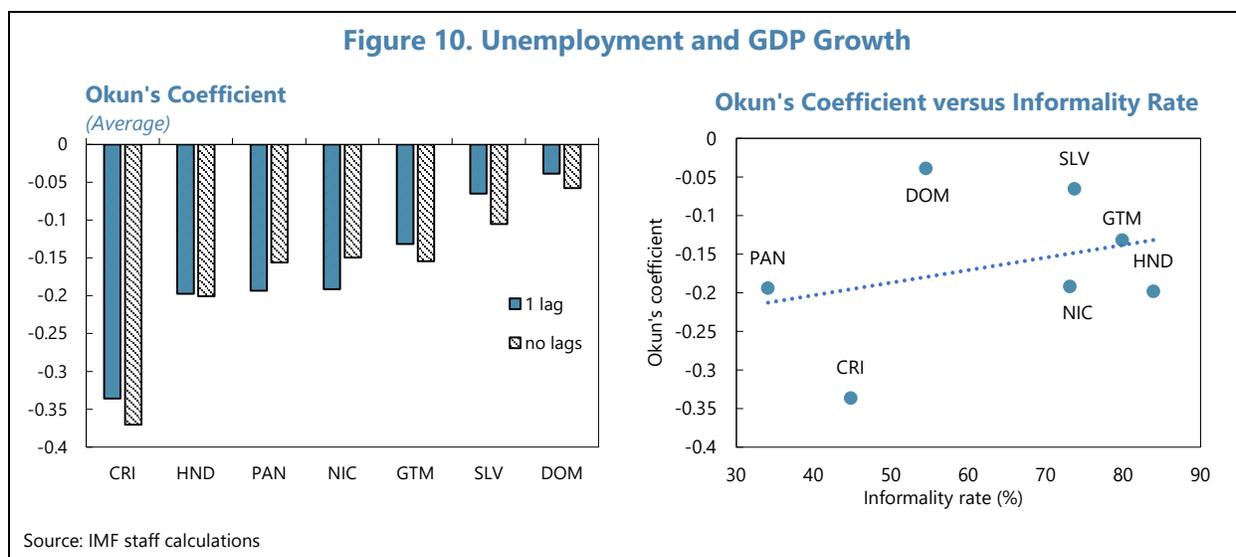
where  $\Delta Z$  is either the change in the variable of interest (unemployment rate, informality rate, or the participation rate) between periods  $t-1$  and  $t$ ;  $\Delta y_{i,t}$  is the change in the log of real GDP between periods  $t-1$  and  $t$ ;  $\alpha_i$  are country-specific fixed-effects capturing country characteristics that do not change over time; and  $f_{(m,t)}$  are common factors that affect all countries and change over time. These common factors are unobservable, and their factor loadings ( $\lambda_i$ ) can be country specific.  $\varepsilon_{it}$  is the residual.

### *Unemployment and Informality over Business Cycle Fluctuations*

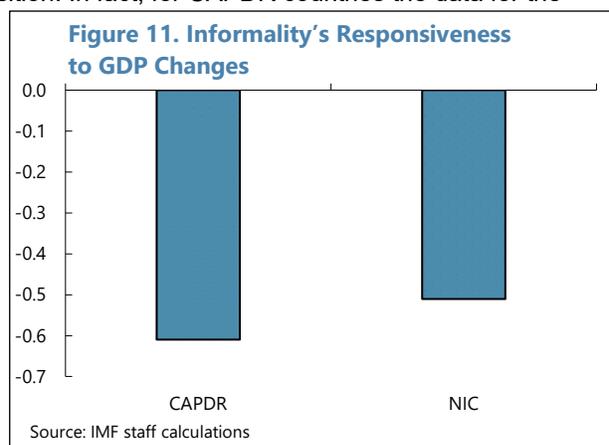
The estimated coefficients of Okun's law for CAPDR countries explore how key structural characteristics or labor market policies affect the responsiveness of unemployment and informality to changes in output growth.

In line with the literature, the small Okun coefficients in CAPDR countries suggest that unemployment responds less to output fluctuations than in advanced economies due to the high level of informality (See Figure 10). WHD, REO (2019) estimated the average Okun's coefficient for advanced economies to be about -0.3, while the average coefficient for CAPDR countries is about -0.16. The estimated coefficient for Nicaragua is in the range (-0.19, -0.14) depending on the number of lags used. Loayza (2018) argues that in the absence of unemployment insurance or an adequate social safety net, a low elasticity of unemployment to GDP growth can mitigate the adverse social impacts of recessions (such as increased poverty and crime). It is important to note that this finding is also consistent with Bakker (2015) which shows that low Okun coefficients are also consistent with the capacity of real wages to adjust to structural change in employment when the economy slows down, as the high informality in CAPDR allows for wage flexibility in the informal sector.

<sup>6</sup> This estimator uses cross-sectional averages of the dependent and independent variables as proxies for unobserved common factors in the regressions; while standard panel estimators usually treat the slope coefficients ( $\beta, \gamma, \theta$ ) as homogeneous across countries and do not produce consistent estimates of the parameters of interest in the presence of cross-sectionally correlated error terms, which could lead to incorrect inference.



We also confirm that the cyclical behavior of informality is quantitatively larger than the one of unemployment as suggested in the section of unemployment decomposition. In fact, for CAPDR countries the data for the period 2010-2020 shows that the informality rate falls by 0.61 percentage points for every additional percentage point of GDP growth (as per the specification with no GDP lags), while the unemployment rate falls on average by around 0.16 points (See Figures 10 and 11). We find heterogeneity in the estimated coefficients across CAPDR countries where Nicaragua stands amongst the ones where responsiveness is the highest (-0.51%). The results provide evidence in favor of the role of informality to mitigate the responses of unemployment to cyclical fluctuations in output.

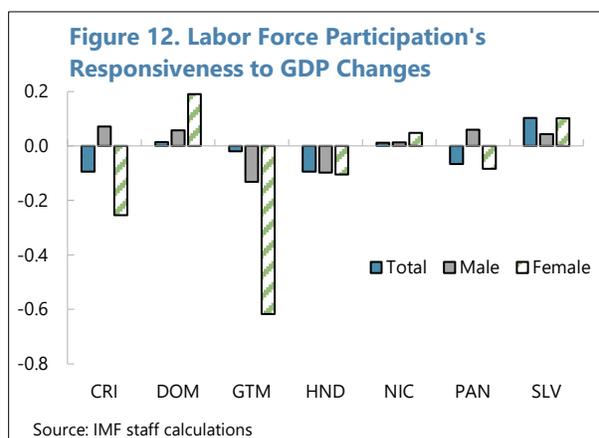


### **Labor Force Participation over Business Cycle Fluctuations**

As illustrated in the unemployment decomposition discussed in the previous section and in line with the evidence presented for advanced economies in Grigoli, Koczan, and Topalova (2018) and IMF (2018), labor force participation moves pro-cyclically. However, when running the regressions of changes in the labor force participation rate (aggregate and by gender) on changes in GDP using the CCE estimator we find some heterogeneity across CAPDR countries.

The sensitivity of participation rates to changes in output tends to be somewhat smaller than what we observed for the unemployment rate or the informality rate, indicating that this margin of adjustment tends to play a more limited role. Nicaragua stands out for the remarkably low (but positive) response of labor force participation to changes in GDP, relative to its regional peers.

Furthermore, the responsiveness of aggregate participation rates to cyclical fluctuations seems to be counter-cyclical in several countries due to changes in female participation rates. Within the region, female participation rates in some countries seem to be very responsive to the cycle, particularly in Guatemala, Dominican Republic, and Costa Rica (Figure 12). The response of female participation to changes in GDP is on average negative for CAPDR countries, indicating that as GDP downturns are more severe, the female participation rate increases thus moving in a countercyclical way.



### Speed of Adjustment of Employment to Shocks

In this section we study the speed of adjustment of employment growth to shocks that generate deviations in its equilibrium levels. A flexible labor market is critical for the adjustment of the aggregate economy to shocks and thus for growth. The economic and social costs of downturns depend not only on the country's ability to mitigate their short-term impacts as we discussed in the previous sections, but also on its ability to revert to its potential. Following David, Pienknagura and Roldos (2019) analysis, we assume that the equilibrium level of employment is related to GDP.

The empirical specification is estimated using an error-correction model (ECM) that employs the heterogeneous panel approach proposed by Pesaran (2006) and is summarized in equation 3 for  $i = 1, \dots, N$  countries; and  $t = 1, \dots, T$  time periods.

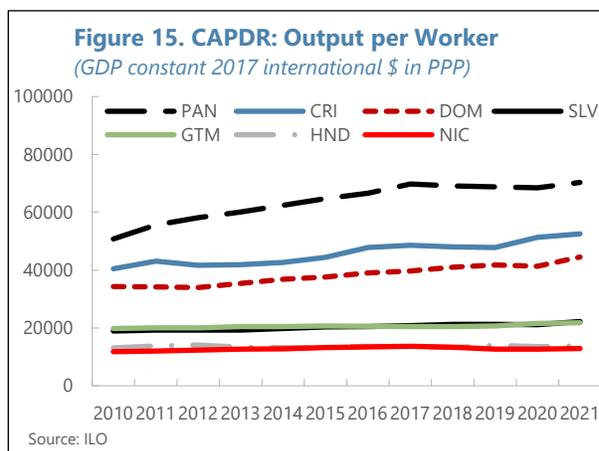
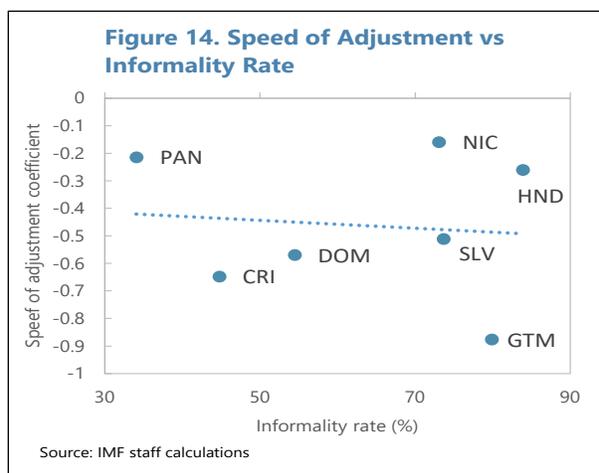
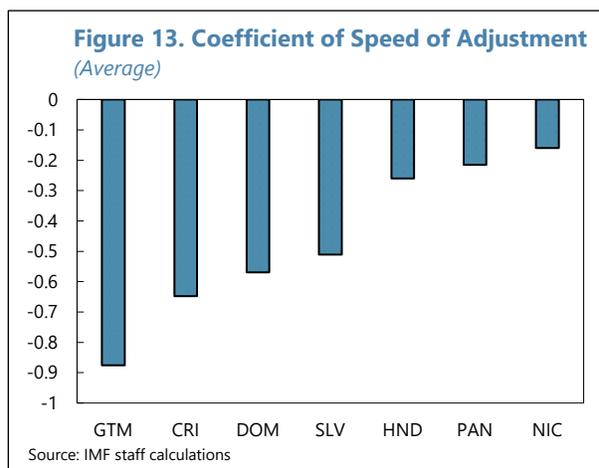
$$\begin{aligned} \Delta e_{i,t} &= \beta_i \Delta y_{i,t} + \alpha_i (e_{i,t-1} - \theta_i y_{i,t-1}) + \vartheta_{i,t} \\ \vartheta_{i,t} &= \alpha_i + \sum_{m=1}^p \lambda_{i,m} f_{m,t} + \varepsilon_{i,t} \end{aligned} \quad (3)$$

where  $\Delta$  is the difference operator,  $e_{it}$  is log employment and  $y_{it}$  is log GDP. The parameter  $\beta_i$  captures the response of employment growth in country  $i$  to GDP shocks, the parameter  $\theta_i$  is the long-run elasticity of employment to GDP, and  $\alpha_i$  is the speed of adjustment parameter. The unobserved parameters  $f_{(m,t)}$  and  $\lambda_{(i,m)}$  capture common factors and their loadings, respectively.

There is a large degree of heterogeneity across CAPDR countries in the estimated coefficients of the speed at which employment reverts to its long-run level (Figure 13). The average estimated speed of adjustment coefficient for the region is  $-0.46$ , which implies that it takes on average about 1.1 years for the region to close half the employment gap (the half-life) - this is consistent with the findings of David, Pienknagura and Roldos (2019) who used data up to 2017. There are countries in the sample for which the speed of adjustment is slower than the average, such as Nicaragua whose estimated speed of adjustment coefficient of  $-0.16$  implies a half-life of about 3.1 years, while countries like Guatemala, Costa Rica or Dominican Republic take on average less than a year to reach the half-life.

In line with the findings in David, Pienknagura and Roldos (2019), a simple correlation analysis shows that higher informality rates tend to be associated with a lower speed of adjustment of total employment (Figure 14) and probably higher wage flexibility in the informal sector. Panama and Guatemala exhibit however a different relationship as the observed differences in the coefficients of speed of adjustment of employment is also related to the characteristics of each country's labor market (regulations and education level).

In previous sections we discussed the role informality played as a buffer for unemployment to GDP shocks, increasing labor market flexibility. However, as per the findings in this section, higher informality also makes the speed of adjustment of the economy to shocks slower, obstructing labor productivity growth and hampering growth. This is the case for countries such as Nicaragua where labor productivity has been stagnant for the last 10 years (Figure 15). The results shade light on some difficult trade-offs CAPDR countries face with respect to their informality levels and labor market outcomes which will be discussed in the next section in more detail.



## V. Conclusion and Policy Recommendations

In this study we find that:

- Nicaragua's labor market is characterized by high levels of informality, low and stable unemployment rate, high underemployment, high labor force participation but low female participation compared to men, and relatively flexible labor protection legislation with respect to the region. Women, low educated workers, and services and retail sectors are the most vulnerable during economic downturns in Nicaragua.
- Informality in Nicaragua is high, it reached 77 percent of the employed in 2020. It has a countercyclical behavior - stronger than other countries in the region that also have high levels of informality - and acts as a buffer against output fluctuations that mitigate the adverse social impacts of recessions.
- Informality is associated to Nicaragua's productive structure, specialization patterns and unfavorable insertion in international trade that do not generate the right incentives to formalize.
- Labor force participation rate in Nicaragua is also cyclical, but less so than the informality rate, indicating that this margin of adjustment tends to play a more limited role. The responsiveness of participation rates to cyclical fluctuations seems to be mainly due to changes in female participation rates.
- Unemployment rate in Nicaragua is low and roughly stable despite business cycle fluctuations which is reflected in a small Okun's coefficient. Fluctuations in informality and to a lesser extent, in participation rates, have been the active margins of adjustment during economic downturns that mitigate changes in unemployment.
- The speed of adjustment of total employment to shocks in Nicaragua is the lowest in the region and this is related to the high level of informality and characteristic of the labor market (e.g., flexibility as well as high minimum wages relative to value added) that hampers the recovery.

The economic and social costs of economic downturns depend not only on the country's ability to mitigate their short-term impacts but also on its ability to revert to its potential. In Nicaragua the degree of informality poses some difficult trade-offs as it mitigates the impact of recessions in labor markets, but it also delays the recovery after shocks as it is too high. It seems then, that reducing informality in Nicaragua could bring economic growth gains.

The labor market in Nicaragua is flexible in terms of minimum wages and hiring/firing costs, so policies would better be focused on increasing the formalization gains<sup>7</sup> while treating informality as a multifaceted phenomenon. Building up unemployment insurance (counter-cyclical funds, e.g., Germany) and strengthening worker's safety nets could guarantee adequate protection of workers and give them enough time to search and match jobs (Bosch and others, 2015). This would substitute the buffer role of informality in Nicaragua, at least to a certain extent.

Embarking on structural reforms to increase labor productivity and generate more inclusive growth (WEO, 2019, Chapter 3). Nicaragua needs policies oriented to the conversion of its productive structure to higher value-added products and to generate the supporting human capital needed (Hernandez, 2010). Improvements in health and education are key elements to raise human capital, including training programs that support sectorial transitions. Tackling informality in Nicaragua should be part of a broad development agenda that

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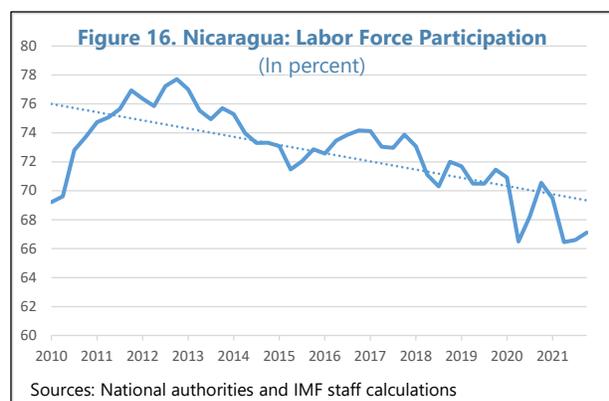
<sup>7</sup> Besides, according to the micro literature it is better to lower entry costs to formality than to increase the costs to informality (REO, 2019).

creates a virtuous cycle of growth and better jobs (World Bank, 2019), and renews institutions and cultural norms. La Porta and Shleifer (2014) also noted that an important bottleneck to formality is the supply of educated entrepreneurs, rather than better-educated workers, who can run formal firms and generate formal employment.

Policies to protect procyclical workers can have significant effects during downturns. Leveling the playing field for female labor force participation<sup>8</sup> can include measures that reduce discrimination against women in the formal sector and working arrangements that support women in the workplace (e.g., teleworking possibilities, subsidize childcare and elderly care, put in place parental leave, etc.). Investing in women's human capital through education would be the most effective policy from both macroeconomic and social perspectives, but it is a measure that takes a long time to bear fruit, given the decades needed to change the education profile of the entire labor force. Measures such as conditional cash transfers for school or training attainment that target low-skilled and poor women may have a greater impact in reducing poverty and inequality and may be potentially more effective in the short term (Fabrizio, 2020).

Finally, in the case of Nicaragua, we observe a persistent downward trend of labor force participation. While in recent years, this trend can be associated with a marked increase in labor migrants—especially to the United States—further research is needed to carefully assess the impact of falling labor force participation and to mitigate negative effects on the labor supply and on long term growth.

Overall, these recommendations are providing options to be further explored. For implementation, policy makers will need to consider each recommendation in the context of the country's existing labor framework and overall economic strategic goals.



<sup>8</sup> In the World Economic Forum's 2022 report on Global Gender Gap, Nicaragua improved its overall ranking position to seventh. While the educational attainment and political empowerment subindexes improved, Nicaragua's economic participation and opportunity, gender gaps have widened since 2017. In 2022, the gaps are evident in women's labor-force participation.

## Appendix. Results of the Estimation of Equations (2) and (3)

Table A1 presents the results of equation (2) for informality using the common correlated effect (CCE) estimator and including lags of GDP. Although the sample includes only 15 Latin American countries in the period 2010 to 2020, CCE estimators have satisfactory small sample properties even under a substantial degree of heterogeneity and dynamics, and for relatively small values of N and T (Pesaran 2006).

**Table A1. Informality Responsiveness to GDP Changes**

	(1)	(2)	(3)
	No lags	1 lag	2 lags
$\Delta\text{GDP}_t$	-0.525** (0.247)	-0.733** (0.336)	-0.675** (0.307)
$\Delta\text{GDP}_{t-1}$		0.226 (0.368)	0.701 (0.6)
$\Delta\text{GDP}_{t-2}$			-0.257 -0.397
Constant	0.147 (1.21)	-1.887 (1.569)	-0.521 (1.710)
Observations	141	141	141
Number of countries	15	15	15

Sources: WEO, ILO, and IMF staff calculations based on IMF REO (2019)

Note: Standard errors in parenthesis; \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

In Table A2 below we present the results of the estimation of the common correlated effect error correction model (ECM) of employment (equation 3) for 132 countries in the period 1970 to 2020.

**Table A2. Common Correlated Effect ECM of Employment**

	(1)	(2)	(3)
	No lags	1 lag	2 lags
Lagged log employment	-0.038*** (0.003)	-0.192*** (0.019)	-0.224*** (0.022)
Lagged log GDP	0.007*** (0.002)	0.074*** (0.012)	0.078*** (0.014)
GDP growth	0.057*** (0.006)	0.115*** (0.021)	0.117*** (0.020)
Implied long run elasticity	0.175*** (0.047)	0.382*** (0.075)	0.345*** (0.070)
Observations	3783	3783	3662
Number of countries	132	132	132

Sources: WEO, ILO, and IMF staff calculations based on IMF REO (2019)

Note: Standard errors in parenthesis; \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

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