



# COLOMBIA

## SELECTED ISSUES

March 2021

This Selected Issues paper on Colombia was prepared by a staff team of the International Monetary Fund Staff Report for the 2021 Article IV Consultation. It is based on the information available at the time it was completed on March 9, 2021.

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**International Monetary Fund**  
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# COLOMBIA

## SELECTED ISSUES

March 9, 2021

Approved By  
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Department

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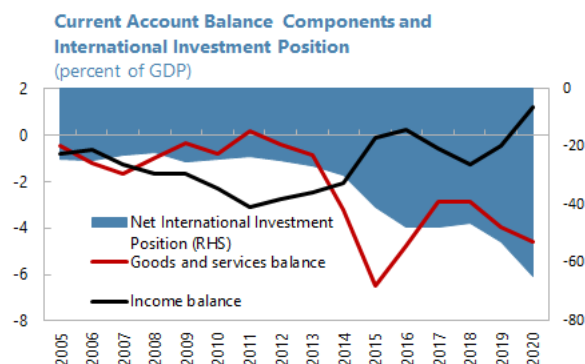
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## EXTERNAL DEFICITS AND THE STABILIZING ROLE OF COLOMBIA'S INCOME BALANCE

Colombia's income balance is negatively correlated with its trade balance owing to the risk-sharing properties of foreign liabilities, which have a large FDI component, and resilient remittances. Colombia's increasing net external liabilities (worsening NIIP) have not yet translated to a lower income balance, and its positive foreign-currency position suggests there are no adverse income or balance sheet effects from depreciations so far. With persistent current deficits and the risk of higher global interest rates, fiscal and structural reforms would help preserve these favorable dynamics in the external position.

**1. Colombia's income balance improved in 2020.** The income balance reached a surplus of 1¼ percent of GDP in 2020 compared to deficits in recent years. Resilient remittances inflows boosted secondary income above 3 percent of GDP but the largest contribution to the improvement came from primary/investment<sup>1</sup> income, which improved by more than 1 percent of GDP to -2 percent of GDP. Primary income receipts (or inflows) fell owing to contracting global activity, but expenditures (or outflows) declined by 1½ percent of GDP owing to the combined effects of Colombia's sharp economic contraction and substantially lower commodity export profits accrued to non-residents.



**2. The income balance strongly mirrors the trade balance.** A negative correlation over time is the typical pattern globally but there is a wide range of degree ([Colacelli and others, 2021](#)) and Colombia's correlation is among the most negative. In particular, the correlation between Colombia's trade balance and income balance is almost -0.8 and the correlation between its trade and primary income balance is -0.9. In 2019 and 2020, the improving income balance partially offset a deteriorating trade balance. The offsetting pattern was apparent during previous global economic and commodity price downturns, where investment receipts and expenditures both declined. It was also apparent during the supply-driven oil price decline of 2014-15 and Colombia's associated downturn, in which expenditures declined and receipts were sustained. As the trade balance and economic activity recovered following those episodes, Colombia's investment income expenditures rebounded and the income balance deteriorated. Consistent with this pattern, Colombia's income balance is forecast to worsen in 2021 and thereafter.

**3. Colombia's negative investment income balance is consistent with its negative net international investment position (NIIP).** Both Colombia's gross investment income flows

<sup>1</sup> Since non-investment primary income is negligible in Colombia, we will use the terms interchangeably.

(credit+debit) and their asymmetry (credit-debit) is roughly in the middle of the range in magnitude found in a sample of countries ([Colacelli and others, 2021](#)). Gross flows averaged 7 percent of GDP and the asymmetry averaged 45 percent of gross flows in 2017-19. Countries with larger positive (negative) NIIPs have larger positive (negative) investment income balances ([Alberola and others, 2018](#)), which acts to make the NIIP more positive (negative). Absent offsetting dynamics or policy measures (including those acting through the trade balance), this could have potentially destabilizing outcomes. Colombia's investment income balance of -3 percent of GDP on average for 2017-9 is on par with what would be predicted by a bivariate cross-country regression with the NIIP ([Colacelli and others, ibid.](#)), but the balance is less negative during downturns.

**4. Over time, however, the primary income balance has not tracked its steadily more negative NIIP.** This disconnect implies a change in return differentials on external liabilities and external assets that has become less disadvantageous for Colombia. In particular, although the implied annual return on Colombia's assets held abroad has remained broadly constant since before the Global Financial Crisis (GFC) at 3 percent on average and fell slightly to 2¼ percent in 2020, the higher return on its liabilities held by non-residents declined from 10 percent in 2006-8 to 5 percent in 2017-9 and to about 2½ percent in 2020. Declining differentials are consistent with investors rewarding Colombia's very sound policy frameworks with lower risk premia. Declining return differentials are also consistent with lower profitability of FDI into Colombia driven by lower commodity prices.<sup>2</sup> As a result, Colombia's worsening NIIP has not yet fed back into larger current account deficits through its income balance.

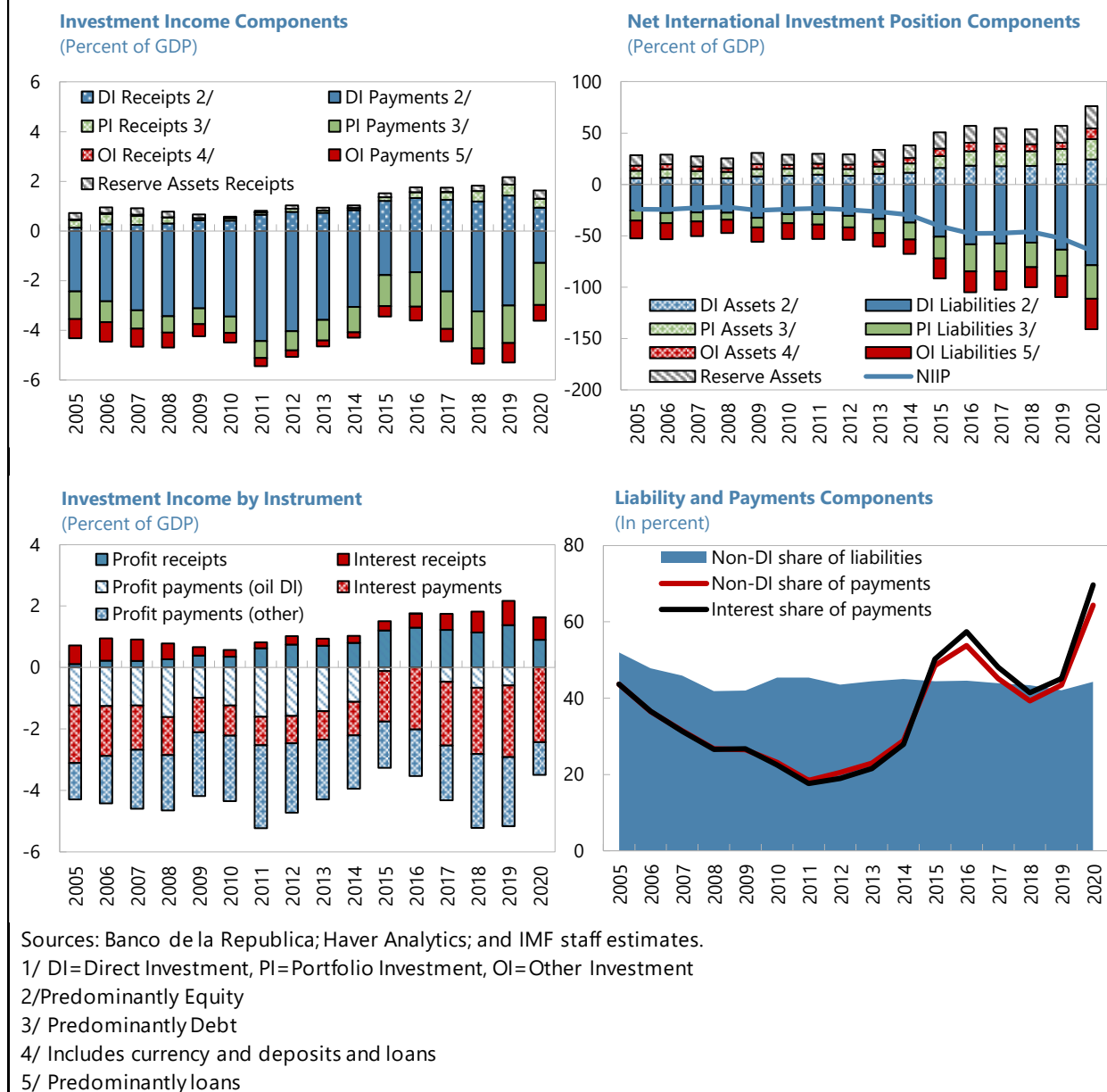
**5. A more detailed breakdown shows the risk-sharing properties of Colombia's IIP liabilities.** Foreign Direct Investment (predominantly equity) accounts for more than half of the increase in foreign liabilities, although it grew at a similar pace to portfolio (predominantly debt) and other (predominantly loans) liabilities. Most of the variation in income payments occurred within direct investment. For example, oil profit payments to non-residents were large during the commodity boom years when Colombia's national income rose rapidly, were negligible following the 2014-6 oil price crash, and moderate since. The rise in external debt induced by the crash translated into higher interest payments to foreigners who lent to Colombia when national income was hurt by the commodity price shock.

**6. With possible implications for valuation effects, Colombia's foreign-currency assets well exceed its foreign-currency liabilities.** The share of assets denominated in foreign currency greatly exceeds the share of liabilities denominated in foreign currency, so foreign currency assets exceed foreign currency liabilities despite a negative NIIP:

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<sup>2</sup> Yields on debt assets and liabilities declined. Yields on portfolio equity assets rose and yields on equity liabilities fell.

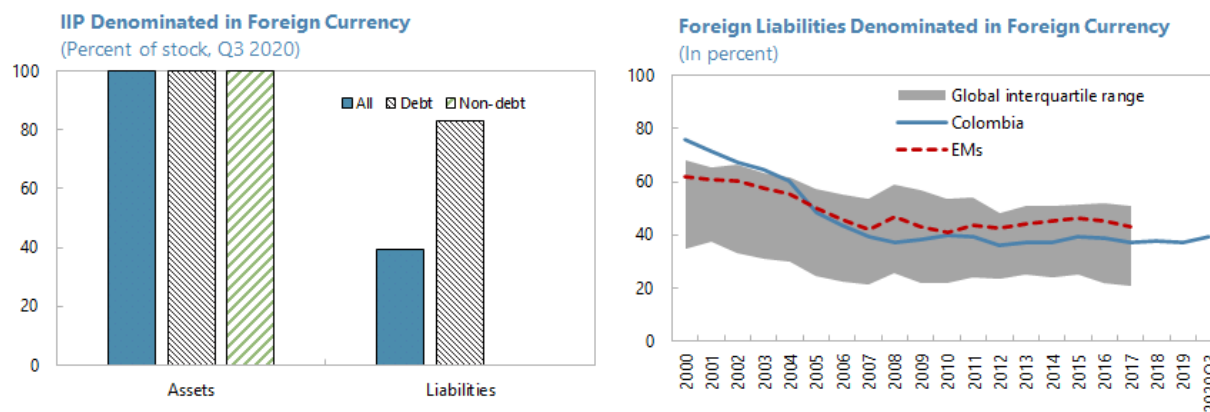
**Figure 1. Colombia: International Investment Position and Income Flows <sup>1/</sup>**



- Colombia's share of foreign liabilities denominated in foreign currency was 40 percent in Q3 of 2020 (including 37 percent in U.S. dollars). Between 2000 and 2017, Colombia's liability share declined more rapidly than in other EMs. The decline can be attributed to both a rising share of direct investment and equity liabilities, which are denominated in local currency, and a declining foreign exchange (FX) share within debt liabilities. Focusing on foreign debt liabilities, the FX share was 83 percent in 2020 Q3 compared to almost 100 percent in 2000.<sup>3</sup>

<sup>3</sup> Within public external debt, almost one-quarter is denominated in local currency. Within private Colombian firms, the majority of unhedged foreign currency debt is owed to creditors with which firms also have an FDI relationship. Within SOEs, most of the debt is held by firms with foreign currency earnings.

- Combining foreign currency exposure shares yields a net *long* foreign currency position of 16 percent of GDP in 2019. In 2020, the net long foreign currency position is estimated to have increased to 21 percent of GDP despite a deterioration in the nominal NIIP. These patterns can be reconciled by the fall in GDP as well as price and exchange rate valuation effects.



Sources: Banco de la República; Benetrix et al (2019); and IMF staff estimates.

**7. The NIIP and its currency composition influence the stabilizing role of the exchange rate with respect to external adjustment.** Wealthier creditor countries could experience long-run appreciations while debtors experience depreciations, though [Alberola and others](#) (2018) only see empirical support for creditors. Shorter-run income shocks (e.g., to the terms of trade) also tend to trigger exchange rate movements, in Colombia. With respect to trade flows, a currency depreciation with (say) a negative terms of trade shock can support the trade balance through price and income effects or through expenditure switching.<sup>4</sup> Finally, the currency depreciation could theoretically weaken or strengthen the investment income balance. In particular, a depreciation would increase both income inflows and outflows in local currency terms and the net result would depend on the relative strengths of the following channels:

- i. A *negative income balance*, which is typically exhibited by debtor countries like Colombia, would tend to become more negative following a depreciation. Specifically, the nominal value of income expenditures would tend to rise more than the nominal value of income receipts for debtor countries. In contrast, a *positive income balance* typically exhibited by creditor countries would tend to become more positive following a depreciation in creditors. Therefore, a depreciation in either a debtor or creditor country would reinforce NIIP / current account positions in that country.
- ii. A *higher proportion of external assets denominated in foreign currency*, like in Colombia, however, translates to a higher proportion of income receipts denominated in foreign currency and thus a larger local-currency increase in receipts following a depreciation. Similarly, relatively low foreign currency liabilities imply a smaller local-currency increase in

<sup>4</sup> See [Country Report 20/105](#). Following a depreciation, trade balance gains in Colombia measured in pesos occur mainly through higher export prices, while gains measured in dollars occur mainly through weaker import volumes. The export volume response has been limited.

payments. This valuation effect based on currency composition works in the opposite direction as that of a negative income balance for debtor countries.

- iii. *Finally, there could also be economic and behavioral effects.* For example, if a depreciation boosts domestic economic activity and profits, some of this will be reflected through larger income outflows. Currency volatility could influence intra-year profit management.

**8. Formally, the net effect on income could be estimated using a CGER-type<sup>5</sup> approach.**

The semi-elasticity of the investment income balance in pesos ( $IB/GDP$ ) with respect to the nominal exchange rate ( $E$ , defined as pesos per unit of foreign currency) is:

$$\frac{\partial IB/GDP}{\partial E/E} = \eta_R S_R - \eta_P S_P$$

$S_R$  and  $S_P$  are income receipts and payments, respectively, as a share of GDP and represent (i) above. With the simplifying assumption that there are no behavioral effects,  $\eta_R$  and  $\eta_P$  reflect mechanical foreign exchange exposure or valuation effects in (ii) above. In particular, additionally assuming that income denominated in local currency is unchanged in local currency terms, and that income denominated in foreign currency is unchanged in foreign currency terms,  $\eta_R$  ( $\eta_P$ ) is the share of income receipts (payments) denominated in foreign currency. Incorporating (iii) in  $\eta_R$  and  $\eta_P$  is equivalent to relaxing these assumptions.

**9. For Colombia, a depreciation would improve the NIIP while income balance benefits are negligible and can fluctuate.**

- Colombia's net long foreign currency position implies that a depreciation of 10 percent would improve the NIIP by about 2 percent of GDP through valuation gains.
- Considering mechanical effects, a depreciation improves the primary income balance in Colombia's case because the positive valuation effect on the IIP stock outweighs structurally disadvantageous rates of return on Colombia's liabilities. Annual income balance effects are smaller than stock effects – as one would expect because income flows are much smaller – and vary from year-to-year as income components fluctuate. To illustrate, we use stock data to approximate foreign currency income FX exposures.<sup>6</sup> For 2019, the mechanical semi-elasticity is 0.013 such that the depreciation of that year improved the income balance by 0.14 percent of GDP (Table 1). The semi-elasticity is small compared to the trade balance semi-elasticity (0.12–0.13). In 2020, the semi-elasticity is 0.006. The intuition behind the smaller effects in 2020 is that

<sup>5</sup> Our approach adapts from [Colacelli and others \(2021\)](#), who introduce the terminology. The expression is evaluated at the initial value of GDP and abstracts from the mechanical or economic effects of the exchange rate on GDP. The approach can be generalized to denote changes in the value of the peso relative to multiple foreign currencies – see [Benetrix and others \(2019\)](#).

<sup>6</sup> We divide  $\eta_R S_R$  into interest and non-interest receipts and apply respective debt asset and non-debt asset denomination shares. We divide  $\eta_P S_P$  into interest and non-interest payments and apply respective debt liability and non-debt liability FX denomination shares. We use the previous year's stock data and contemporaneous flow data.



robust FX-denominated payments on debt are higher as a share of GDP while non-debt payments denominated in pesos declined.

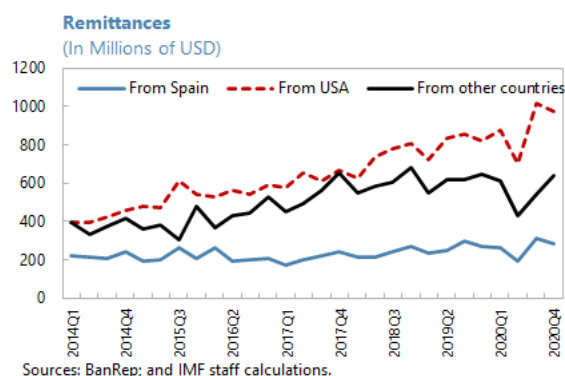
- Incorporating possible economic effects could make a depreciation less favorable to the income balance, with semi-elasticities of 0.010 and 0.004 in 2019 and 2020, respectively. We incorporate economic effects estimated by [Colacelli and others \(2021\)](#) but note the estimates are not robustly significant across specifications. Nonetheless, together with small or insignificant effects found elsewhere in the literature,<sup>7</sup> these values suggest that, at best, the exchange rate benefits on the current account through the investment income channel are negligible.

<b>Table 1. Colombia: Income Balance Semi-Elasticities</b> (Positive value indicates depreciation increases income balance)		
	<b>2019</b>	<b>2020</b>
<b>Mechanical only</b>	0.013	0.006
<b>With possible behavioral effects</b>	0.010	0.004

**10. Turning to drivers of secondary income, Colombia's stock of emigrants has continued to grow.** The stock grew rapidly between 2000 and 2010 from 1.4 to 2.6 million people. It grew by only 0.1 million to 2015 and by another 0.3 million to reach an estimated 3 million people in 2020 ([United Nations](#)). Colombia has also been a notable recipient of immigrants including from Venezuela.

**11. Remittances inflows have been resilient.** Remittances have been rising steadily as a share of GDP since 2014, when the share bottomed near 1 percent after earlier declines. This pattern is broadly consistent with the pace of emigration. In 2020, remittances rose by ½ percent of GDP to 2½ percent of GDP and rose even in nominal U.S. dollar terms (by 3 percent).

- Supporting push factors for 2020 include growth in U.S. remittances outflows (of 2¼ percent in the first nine months of 2020 globally), which could be attributed to U.S. policies to support household incomes in response to the economic contraction. In general, stronger host country conditions increase outward remittances ([Faini, 1994](#); [Higgins and others, 2004](#)). Remittances from Spain have also been resilient.



<sup>7</sup> Reduced-form regressions where the dependent variable is the income balance, the trade balance, and/or the current account balance suggest the exchange rate effect is negligible and insignificant for a global sample ([Alberola and others, 2018](#)) or for oil exporters ([Behar and Fouejieu, 2017](#)). [Colacelli and others \(2021\)](#) estimate values of 0.5 and 0.3 for  $\eta_R$  and  $\eta_P$  of which most of the effect is owing to mechanical effects analogous to (ii) above. Their approach may be vulnerable to omission of time-varying country specific variables like the terms of trade.

- Regarding pull factors, Colombia's relatively sharp economic contraction in 2020 could have sparked a countercyclical remittances inflow response. Considering a longer time horizon, Colombia's relatively modest growth since the 2014 oil price decline is also a likely contributor to rising remittances. These patterns would be consistent with evidence that remittances to Colombia have altruistic motives and are countercyclical ([Garavito-Acosta and others, 2019](#)).

**12. Depreciations can complement the stabilizing role of remittances inflows.** In peso terms, inflows of remittances grew by 16 percent in 2020. There is some evidence that depreciations in the home relative to host country increase remittances inflows in local currency or as a share of GDP, though the degree depends on whether remittances are more sticky in host or home currency terms.<sup>8</sup> This suggests that exchange rate flexibility in response to external shocks like commodity prices can help stabilize the current account through the secondary income channel and provide additional income to support domestic economic activity, thus reducing its volatility.<sup>9</sup>

**13. Over the medium term, NIIP and income flow dynamics risk becoming less benign.** Alongside resilient remittances, Colombia's success in securing funding in local currency and the risk sharing properties of its equity liabilities have helped it weather shocks. Lower global interest rates have helped contain income outflows. Such properties contributed to the decline in Colombia's current account deficit in 2020. However, as Colombia's economy recovers, the deficit is expected to rise towards 4 percent of GDP over the medium term, which would reinforce the decline in the NIIP and could, unlike recent experience, increase income outflows. If global interest rates normalize and if Colombia's risk premium were to rise, this would increase income outflows further. However, resuming the downward trend in FX liabilities would keep adverse balance sheet and income balance effects of depreciations at bay.

**14. Colombia's current account deficit highlights the importance of fiscal and structural reforms to boost competitiveness** ([Country Report 18/129](#)). Colombia's flexible exchange rate can if needed help stabilize the current account, albeit modestly, through the trade balance channel without adverse income balance effects. Colombia's fiscal reforms would also be supportive of a narrowing current account deficit by reducing internal dissaving. Moreover, such reforms would preserve investor appetite for local-currency debt and low risk premia (see Staff Report for the 2021 Article IV Consultation). The current account deficit could also be reduced through reforms to aid export diversification and competitiveness, include closing infrastructure gaps, lowering transport costs, streamlining non-tariff barriers, and improving customs procedures.

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<sup>8</sup> For example, [Yang \(2008\)](#) estimates that a one percent appreciation in the home country increases remittances by 0.6 percent in recipient-country currency, which implies a reduction in home-country currency. For Colombia, [Garavito-Acosta and others \(2019\)](#) find no significant effect of the exchange rate on remittances measured in U.S. dollars, which implies a depreciation would raise remittances in local currency or as a share of GDP.

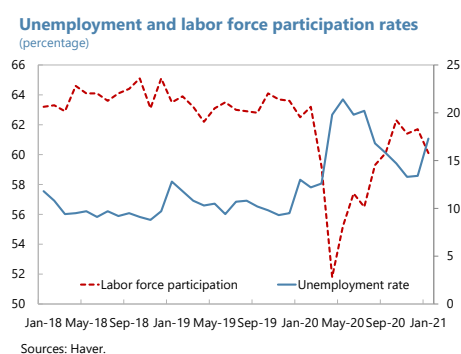
<sup>9</sup> For evidence on the stabilizing effects of remittances on output, see [Hakura and others \(2009\)](#).

# LABOR MARKET IMPACT FROM COVID-19 AND THE UNEVEN RECOVERY

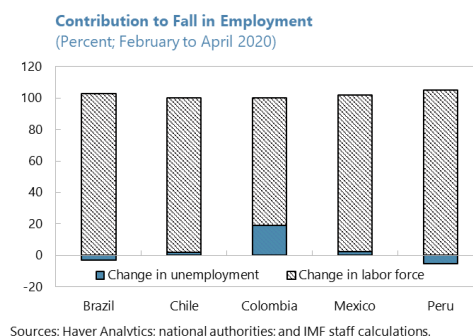
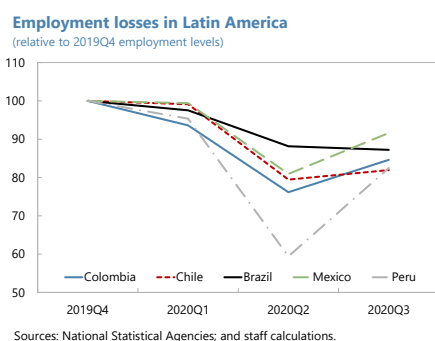
About a quarter of total employment was disrupted at the height of pandemic-induced lockdowns, pushing the unemployment rate above 20 percent. Women, the young, and those with low education in informal employment were most affected, as policy transfers helped cushion but did not fully offset the impact. A strong rebound took place in the second half of 2020 led by informal employment growth, which aided adjustment in the economic sectors most affected by the pandemic. Formal employment dynamics and risks from further lockdowns suggest that the recovery might face resistance going forward.

## A. COVID-19 Impact

**1. At the height of the COVID-19 induced lockdowns, about a quarter of employment was temporarily affected last year.** Alongside the deepest economic recession on record in 2020, historical job losses pushed an already high unemployment rate of 12 percent above 20 percent—a historical record. Unemployment rate movements alone, however, understate the total impact of lockdowns as the majority of those who lost their jobs transitioned directly out of the labor force. The labor force participation rate collapsed from 63 percent to a low of 52 percent in April 2020.

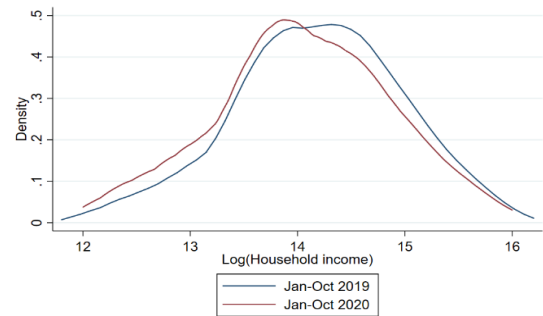


**2. Colombian job losses were substantial by regional standards and unemployment spiked more than in regional peers.** Net employment losses in the first quarter of 2020, as a share of total employment, were higher than in Brazil, Mexico and Chile but lower than Peru. Mirroring the regional pattern, hours worked fell significantly and a majority of workers who lost their jobs dropped directly out of the labor force—with women being distinctly more affected than their male counterparts. Alongside falling employment, large declines in the labor force were seen across the region. The Colombian case, however, is distinguished by larger movements in the unemployment rate. Unlike in LA5 economies, disruptions in economic activity with the pandemic induced a larger rise in unemployment from what was already a higher pre-COVID level.



**3. Employment and income losses were unevenly distributed, worsening inequality.** With the downturn, significant decreases in mean and median household earnings produced a leftward shift in the distribution of household incomes as inequality worsened. This was to a great extent due to job and labor income losses being concentrated among those in poorer households, with low levels of education, and in informal jobs or self-employment (Figure 1). In addition, lockdowns disproportionately affected women and the young more (Figure 1) across the distribution. While the former bore a greater burden from childcare and school closings, the latter were less attached to durable labor contracts.

Distribution of household income per capita

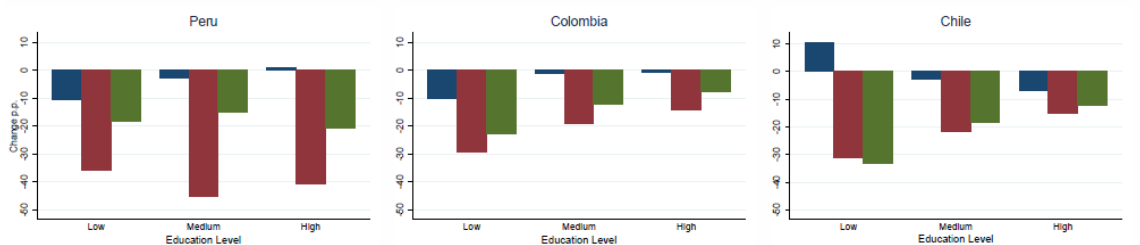


Source: GEIH; and staff calculations.

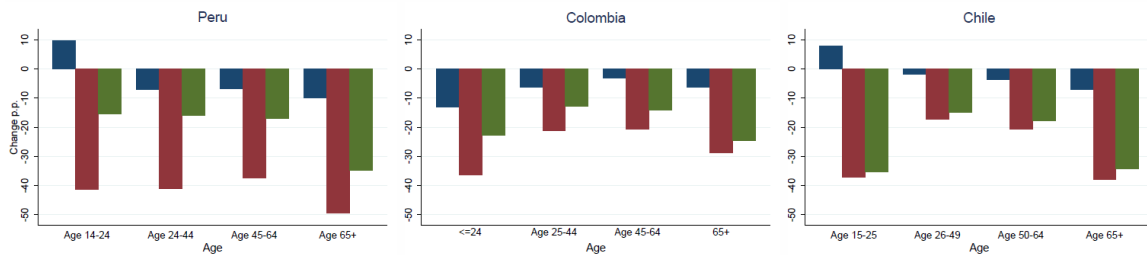
**Figure 1. Colombia: Employment Losses by Worker Characteristic**

(employment loss, percent)

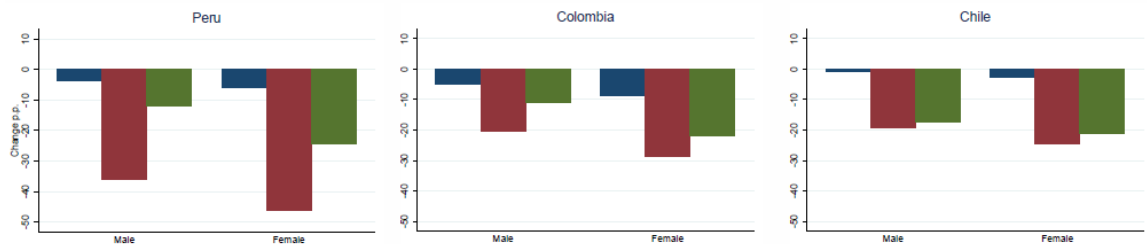
By education



By age



By gender



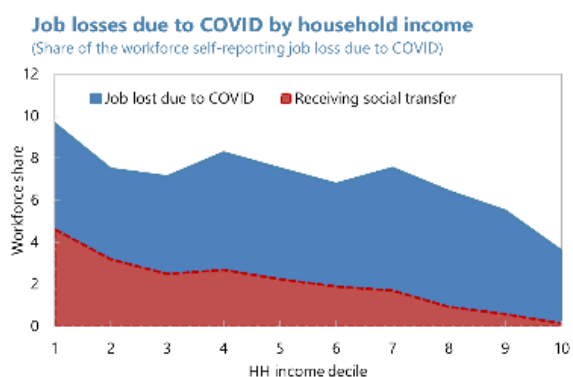
2020:Q1-2019:Q4    2020:Q2-2019:Q4    2020:Q3-2019:Q4

Source: National Statistical Agencies and staff calculations.

## B. The Transfer Policy Response

**4. In response to the pandemic, Colombia was able to leverage social protection transfer systems already in place.** According to self-reported household survey data, over half of the poorer households are covered by some form of transfer in Colombia before COVID-19. This takes into account pre-pandemic pension transfers, unemployment insurance schemes, and other conditional and unconditional cash-transfer programs. The well-targeted Familias en Accion program remains the most important transfer mechanism in terms of coverage and magnitude among the existing programs, which helped cushion the pandemic's economic blow among its participants. Using the same system to identify beneficiaries for social programs, the recently established—and now expanded—VAT-return transfer program appears to have achieved even better targeted results, as it focused on the poorest among Familias en Accion participants. This notwithstanding, household surveys suggest that a significant portion of transfers are allocated to households that were not among the poorest income deciles (Figure 2)—even before the pandemic—suggesting there is room for improvement in terms of focalization.<sup>1</sup>

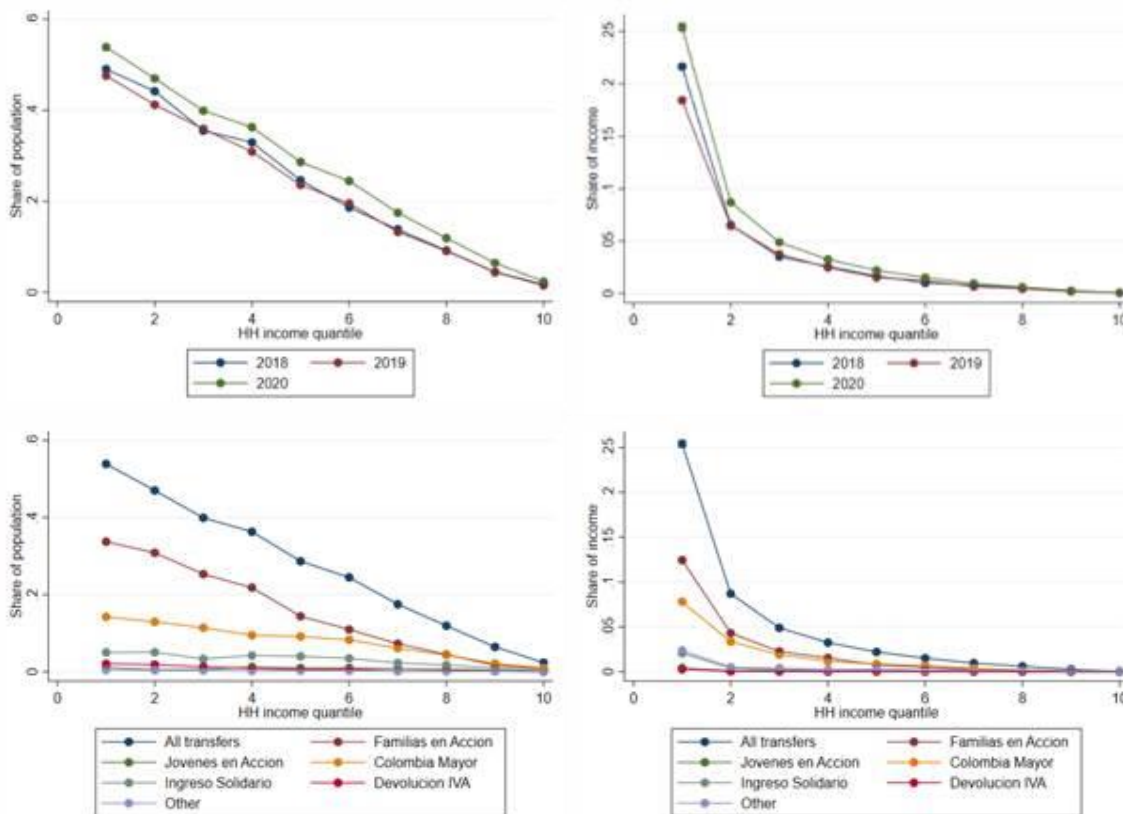
**5. Moreover, coverage and magnitude of social protection programs were expanded as a result of the pandemic (Figure 2).** As part of emergency transfers and employment protection measures worth around 1.3 percent of GDP in 2020, wage subsidies equivalent to 40 percent of the minimum wage for formal workers were implemented at firms experiencing over 20 percent in revenue losses. To help informal workers, a new unconditional transfer program (Ingreso Solidario) was established aimed at 3 million households at risk not covered under other programs, and existing social protection programs were expanded. Household survey data suggests that the expansion was concentrated among poorer household, although expansions were observed across a significant portion of the household income distribution including above-median households in terms of income. This was partly due to the design of pandemic-motivated programs, such as Ingreso Solidario, which intended widespread coverage outside the poorest groups to cover vulnerable populations at risk of moving into poverty. However, because of budgetary limitations and technical challenges in directly reaching all those affected by the pandemic—particularly in the informal sector—the transfer expansion helped but did not fully offset income losses, as a majority of those who reported losing jobs due to COVID-19 were not enrolled in any government transfer program.



Sources: GEH and staff calculations.

<sup>1</sup> Authorities are currently implementing an update of their targeting methodology (SISBEN IV).

**Figure 2. Colombia: Expansion and Coverage of Transfer Programs**  
(Coverage and magnitude by household income decile)



Source: GEIH and staff calculations.

### C. A Swift But Uneven Rebound

**6. A swift—albeit uneven—rebound occurred in the second half of 2020.** This has been mainly driven by a record number of workers coming back from out of the labor force directly into employment status. The labor force participation rate snapped back 10 percentage points to 62 percent. As over two thirds of those who joined the labor force became employed, this contributed to a near 7 percentage point decrease in the unemployment rate to 13 percent by the end of the year. Overall, workers coming back to the labor force into employment account for over 75 percent of the total employment recovery observed on a year-on-year basis—many of them likely returning to their pre-pandemic jobs. The corollary of this is that the total number of unemployed has been relatively stickier, with the share workforce in unemployment remaining 2-3 percent above their pre-COVID level. Moreover, as the reopening transition slowed, the rebound in

#### Employment losses

(YoY change, share of the labor force)



Jan-18 May-18 Sep-18 Jan-19 May-19 Sep-19 Jan-20 May-20 Sep-20 Jan-21

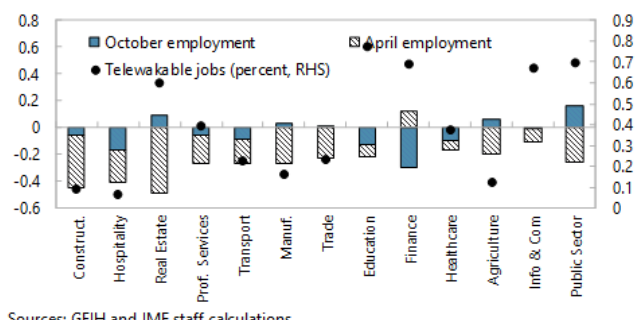
Sources: GEIH and staff calculations.

employment slowed towards the end of the year. As new lockdowns were imposed in January 2021, employment gains stopped, labor force participation declined, and unemployment rose to 17 percent.

**7. Across sectors, those most affected by the lockdown are recovering fast but remain below pre-COVID employment levels.**

Construction and hospitality—two of the sectors most affected by the economic shutdowns and least able to transition to telework modalities—led both employment losses in the first half of the year and the recovery in the second. Despite strong recovery in sectors most directly impacted, most of the economy remained below pre-lockdown employment, with the exception of real estate, agriculture, information and communication, and the public sector.<sup>2</sup> As a significant number of schools remains closed or at partial capacity, employment in the education sector remains depressed. At the end of 2020, there was an outstanding 1.4 million job gap remaining relative to the pre-COVID employment level.

**Employment shock and recovery**  
(Share of pre-COVID employment)

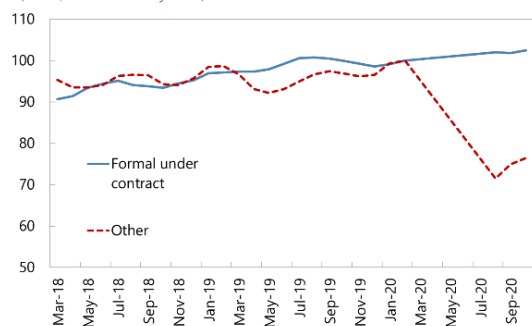


Sources: GEIH and IMF staff calculations.

**8. Informal markets in the most affected sectors acted as a margin of adjustment.** Most jobs appear to have been lost in the informal sector which has also made the fastest rebound since mid-2020.

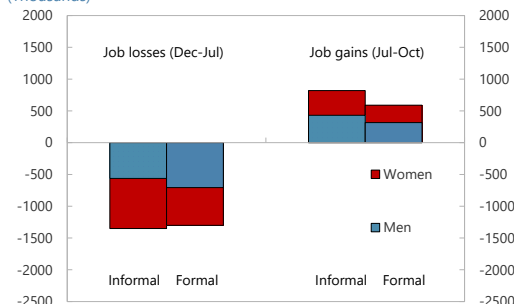
Specifically, large drops in self-employment and labor earnings were seen from those who were not subject to formal contracts (not observed in formal salaried income). This suggests that the informal sector adjusted labor prices and hours faster given the more flexible type of contracts and contract-less arrangements prevalent in that sector. This might have allowed it to be a shock absorber, allowing sectors most affected by the lockdowns to bounce back faster. This informality-dominated drop and recovery, however, had a significant gender imbalance. Even though women comprised about 45 percent of the employed, they accounted for 52 percent of total job losses and 58 percent of the ones in the informal sector. In contrast, only 46 percent of informal sector jobs were regained by women during the rebound phase. Affected by

**Monthly earnings by formality and contract status**  
(Index, 100 = February 2020)



Sources: GEIH and staff calculations.

**Employment changes by gender and informality status**  
(Thousands)



Sources: DANE; and staff calculations.

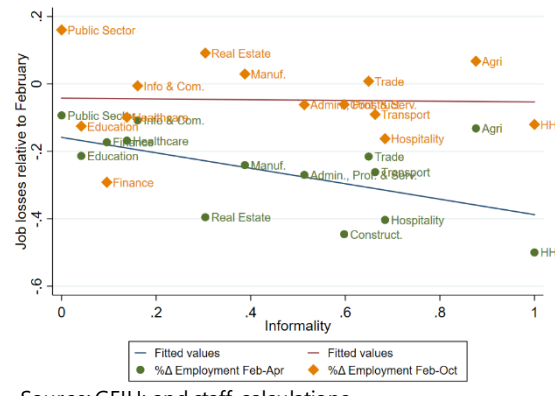
<sup>2</sup> Sector decomposition using available GEIH data as of October 2020.

increased household burdens and school closures, women have been slower to come back to the labor force.

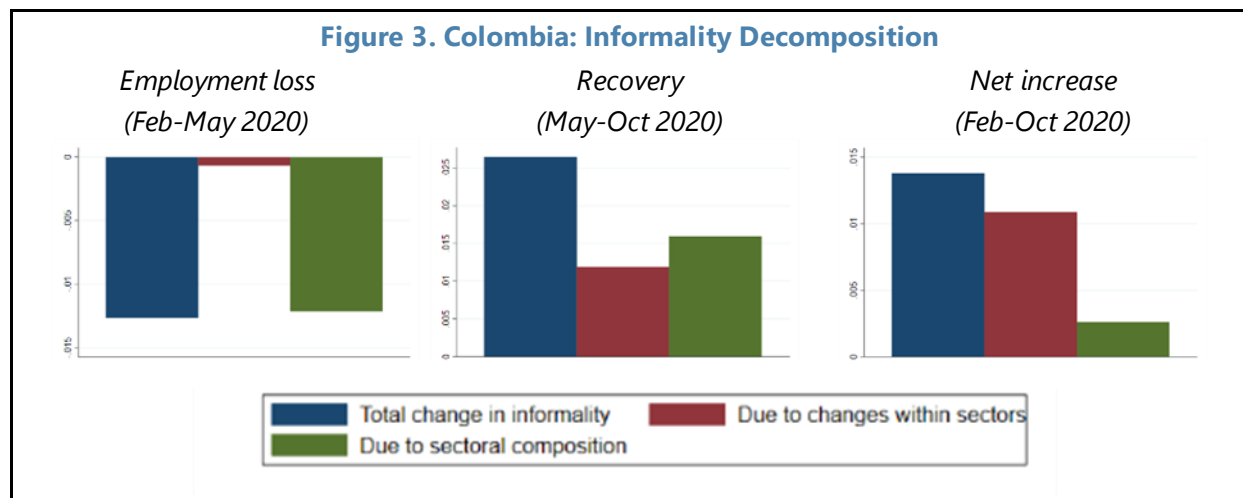
**9. Higher initial levels of informality in sectors hit harder by the pandemic appear to have softened its overall employment impact.** There was a negative correlation between

employment losses at the height of the shock and the pre-COVID-19 level of informality, as sectors most affected also happened to have large levels of informal employment. This correlation disappears when accounting for jobs recovered, meaning that highly informal sectors that experienced the largest employment losses also bounced back more quickly.<sup>3</sup> When decomposing the employment loss and recovery phases into their between- and within-sector components (Figure 3), we observe the following key patterns. Between sectors, most of the employment loss was driven by contracting informality-led sectors, and the job recovery in the second half of the year has been driven by both the recovery of those same sectors as well as by the increase of informality *within* these sectors. To the extent that these *within* sector movements continue, this can imply more persistent changes in the contractual structure of the economy toward greater informality. This pattern is at odds with the long-running formalization trend observed before the pandemic.

Employment losses by sector and informality intensity

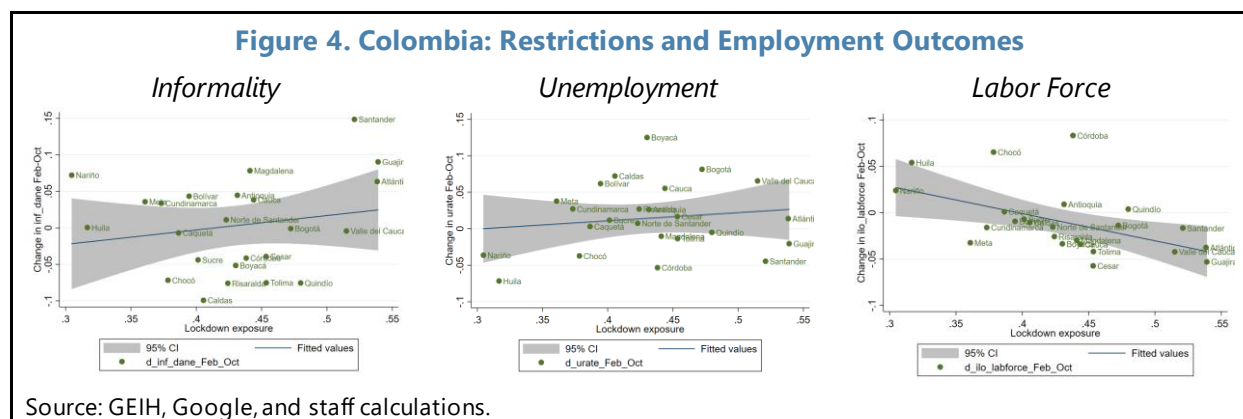


Source: GEIH; and staff calculations.



<sup>3</sup> Chart showing rebound as of October 2020.





## D. A Recovery at Risk

**10. Even after a strong rebound in 2020H2, economic lockdowns were associated with movements in unemployment, participation, and informality rates that still lingered into 2021.** The scatterplots in Figure 4 use a simple measure of lockdown intensity by aggregating de-jure sector-level lockdown indicators at the regional level and correlate this with changes in labor outcomes between February of October.<sup>4</sup> The sectoral intensity indicator presented is therefore a measure of the level of ex-ante exposure to lockdowns a region faced, based on the sectoral composition of its employment base. Consistent with the nation-wide pattern, most regions across Colombia experienced increases in unemployment and informality along with decreases in labor force participation and the magnitude of these changes was correlated with ex-ante exposure to lockdown measures.

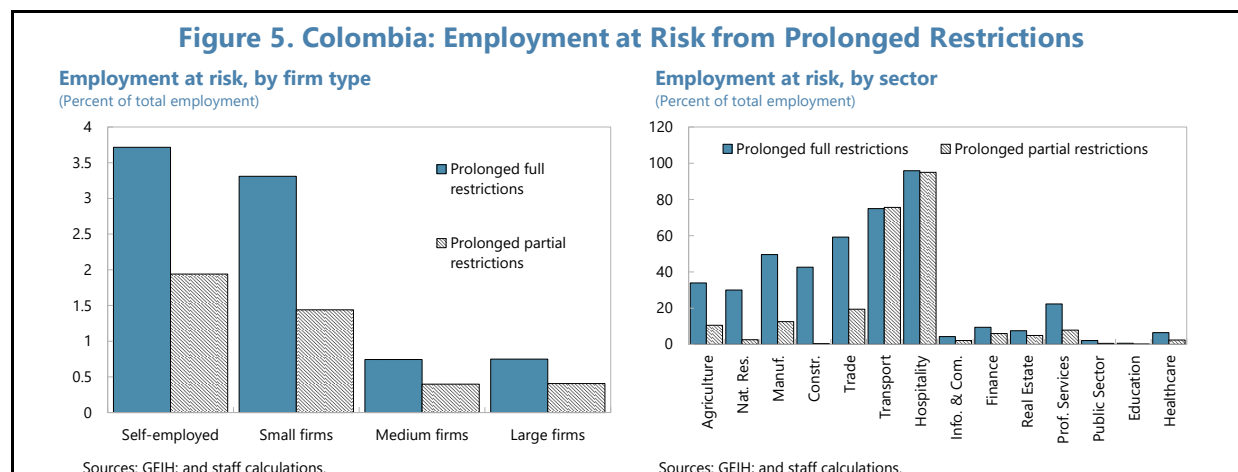
**11. Renewed restrictions—necessary to fight the pandemic—highlight that employment gains remain at risk (Figure 5).** Using an adaptation from the employment and value-added at risk framework from Alfaro et al. (2020)<sup>5</sup>, we compute a measure of employment at risk for different sectors and firm-types in the Colombian economy. The framework<sup>6</sup> uses individual job loss probabilities depending on (i) a sector-specific demand shocks, (ii) a sector specific supply shock driven by lockdowns, (iii) a worker's occupation and telework capacity, (iv) the impact of lockdowns and demand shocks on upstream sectors (suppliers) and downstream sectors (buyers), and (v) the potential uneven impact of the lockdown on firms of different sizes. Employment at risk is computed as the sum of all individuals employed in a sector or firm-type as observed in household surveys between August and October 2020, weighted by job loss probability. The analysis highlights that, given Colombia's production structure, significant jobs remain at risk—either in terms of income, hours, or total job losses—from prolonged lockdowns. Risks to employment are concentrated

<sup>4</sup> The pattern is consistent with that documented by Morales, L., Bonilla-Mejia, L., Pulido, J., Florez, L., Hermida, D., Pulido-Mahecha, K. and Lasso-Valderrama, F. (2020).

<sup>5</sup> Alfaro, L., Becerra, O. and Eslava, M. (2020).

<sup>6</sup> See October 2020 Regional Economic Outlook (International Monetary Fund, 2020) for details.

among small firms or self-employed in the already affected sectors of construction, tourism, transportation and other selected services.



## E. Discussion

**12. Employment dynamics and risks suggest that the recovery faces resistance in terms of job gains going forward for both cyclical and structural reasons.** From a conjunctural perspective, informal jobs temporarily lost in lockdown-affected sectors have made a significant bounce back and absorbed most of workers transitioning back into the labor force. However, employment at risk analysis suggests that these same sectors are vulnerable to job losses depending on the strength of the recovery. From a more structural perspective, gains have been slower in formal jobs under more rigid salaried contracts, unemployment numbers have been somewhat sticker, and a significant number of women have still not returned to the labor force due to school closures and the gender imbalance in child and household care. This suggests that making further gains will be harder, risking more permanent losses in potential output.<sup>7</sup> Thus, a full employment recovery will require, first and foremost, a prompt control of the pandemic through a successful vaccination campaign to underpin a stronger cyclical recovery—but it will also require labor market adjustment that can be slowed down by Colombia’s structural rigidities.

**13. Employment at risk analysis emphasizes the need for a faster economic recovery, with continued vigilance and policy support.** As the pandemic is not yet eradicated and new restrictions have resumed in January 2021, policy support should continue, and careful monitoring of arising risks needs to be maintained. The employment at risk calculations presented highlight that—because Colombia’s sectoral production and employment structure prominently features vulnerable firms in pandemic-sensitive sectors—prolonged economic shutdowns can give rise to renewed employment losses and small-firm led insolvency problems of significant scale. Moreover, most of the recent bounce back in jobs was likely driven by workers resuming their pre-pandemic jobs as sectors reopen. If sectors cannot resume activities quickly enough, the risk that employment losses becoming permanent can increase. This scenario has not yet fully materialized in most sectors

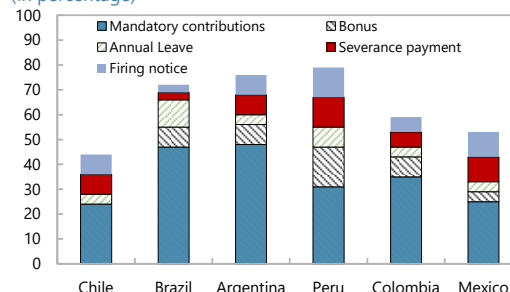
<sup>7</sup> See selected issues chapter on “Potential Output: Reassessment and Pandemic Impact”.

but needs to be monitored, with fiscal, monetary, micro- and macro-prudential policy support tools readily available.

**14. High unemployment and sluggish recovery of the formal sector highlight need to address regulatory barriers that have maintained high structural unemployment in the past.**

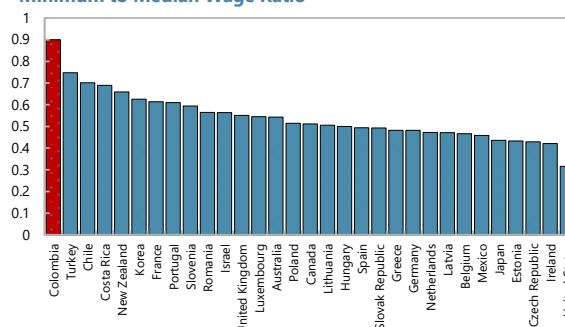
Even before COVID-19, Colombia had a structural unemployment problem with rates above nine percent over the last decade—indicating the need for structural policy actions. Comparatively high non-wage labor costs, minimum-to-median wage ratios, formal business start-up costs, and regulatory barriers for full migrant-integration into formal markets (currently being tackled by recently announced migrant regularization measures) continue to be challenges that need to be addressed both to speed up formal labor market recovery, facilitate adjustment in the short run, and to lower structural levels of informality and unemployment in the medium term. Beyond the pandemic, the transition of the workforce towards formal stable jobs continues to be the main challenge to achieve a more inclusive growth path.

**Costs of Starting a Business and Non-wage Labor Costs**  
(In percentage)



Sources: IADB SIMS database.  
Note: Cost of hiring a salaried labor shown as a percentage of the average of net wages of formal salaried worker.

**Minimum to Median Wage Ratio**



Sources: OECD, ENOE, and staff calculations.

# POTENTIAL OUTPUT: REASSESSMENT AND PANDEMIC IMPACT

*In the wake of the global pandemic, Colombia experienced its largest recession on record and the economic downturn and impact from COVID-19 raise concerns about potential output and possible “scarring” effects. Multiple approaches are used to estimate potential output on data before and through 2020. Based on the information so far, estimates suggest that the pandemic likely affected potential output, primarily through the labor market and lower capital accumulation, with TFP partly offsetting these effects.*

## A. Methodology

**1. Staff compared various estimation approaches to evaluate potential GDP before and during the pandemic.** A production function approach, a multivariate filter (MVF) based on Alichí and others (2017), and a semi-structural new Keynesian model (SSNK) similar to Gonzalez and others (2020) were used to assess the possible implications of COVID-19 and compare them with estimates on potential output before the pandemic.

- The production function (PF) approach relies on a single equation and estimates a Cobb-Douglas production function,  $Y = TFP(K^{1-\alpha}L^\alpha)$ , where Y is output, K and L are capital and labor inputs, respectively, and TFP is total factor productivity. An HP filter is used to smooth the (univariate) time series for labor input (unemployment and participation rate), capital services and TFP. From those smoothed estimates for factors inputs and productivity, potential growth can be computed based on the aggregate production function for GDP.
- The MVF approach relies on a set of reduced-form relationships between key macroeconomic variables to identify unobservable economic slack and underlying potential output from output, inflation, the unemployment rate and CAPU. The system of equations includes a Phillips curve, Okun’s law and capacity utilization (CAPU) equation.
- The SSNK is very similar to the MVF in that it also includes a Phillips curve and gives an important role for oil prices in affecting both potential output and the output gap. It does not include unemployment or CAPU. Whereas the MVF is estimated on annual data, the SSNK utilizes quarterly data. The SSNK is augmented to include a “COVID-19” shock which lowers potential output and also opens the output gap in line with recent literature (Guerreri and others, 2020 or Baqaee and Farhr, 2021).

**2. Given the exceptional nature of the COVID-19 shock, the three methodologies allow for and correct the structural break associated with the pandemic.** The sharp economic contraction brought about by the pandemic, and the subsequent projected recovery represent a structural break, which if not corrected for, can impact potential output estimates before and after

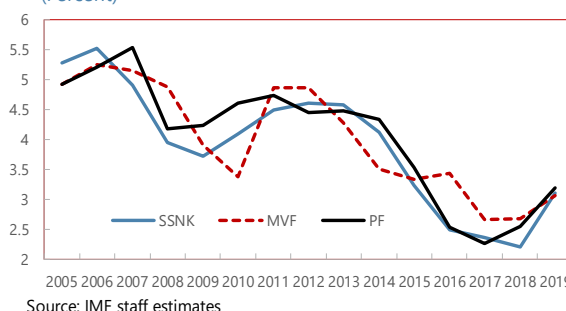
the pandemic.<sup>1</sup> To overcome this problem, potential output estimates prior to the pandemic are estimated using data for the period prior to the pandemic (for both the MVF and SSNK) and including projections from the January 2020 WEO (production function approach).<sup>2</sup> For estimating the impact of the pandemic in 2020 both the MVF and SSNK utilize latest information on output, inflation, the exchange rate, and the interest rate. The MVF also uses information from the unemployment rate and CAPU, whereas the SSNK from the oil price and risk premia. In the case of the PF, WEO projections for output, capital and labor are used (see below for more) and filters on capital, labor and TFP are applied to produce estimates of potential.<sup>3</sup>

## B. Potential Output Before The Pandemic

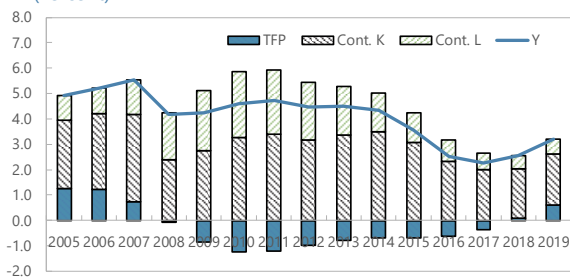
### 3. Potential growth had slowed following the 2014-16 terms of trade shock but was recovering before the pandemic.

In line with Lanau and others (2017), potential growth over the last two decades has been mainly led by investment and labor force growth. Low productivity growth and weaker capital accumulation had contributed to the slowdown in potential output since 2014. As productivity and investment recovery (the latter partly in response to corporate income tax cuts),<sup>4</sup> Venezuelan migration (which boosted the labor input)<sup>5</sup> had led to a pick-up in potential growth in 2018 and 2019.

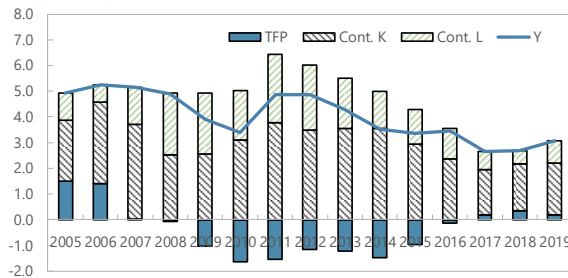
Potential Output Growth Estimates (Percent)



Production Function Approach (Percent)



Multivariate Filter Approach (Percent)



<sup>1</sup> Filters will smooth a series putting more weight to the nearest leads and lags. Hence, past estimates of the smoothed series (e.g. estimates in 2018 and 2019) will be affected by the pandemic. Smoothed Kalman filter estimates are also subject to the same problem.

<sup>2</sup> The use of pre-pandemic projections for the production function approach is due to the use of the HP filter, which can be sensitive to the last observation used.

<sup>3</sup> Bodnar and others (2020) do a similar exercise for the euro area.

<sup>4</sup> See Colombia selected issues for 2017 and 2019.

<sup>5</sup> See IMF Country Reports 19/104 and 20/106.

## C. On Determining the Impact of Covid-19 on Potential Output<sup>6</sup>

**4. The pandemic might have affected potential output and resulted in scarring effects through various channels.** There is ample empirical evidence suggesting that recessions led to permanent output losses (e.g. Cerra and Saxena 2008, Ball 2014 or Martin and others 2015). Many explanations are given for this impact.

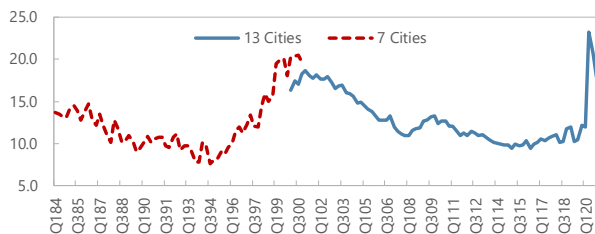
- *Labor market channels.* Labor inputs will decline in response to higher unemployment and lower participation (see labor market SIP), and the efficiency of labor is also likely to decline over time as workers lose their skills during unemployment periods or do not find jobs that are commensurable with their skills (Blanchard and Summers 1986). In the case of Colombia, with a quarter of the employed persons being temporarily displaced both into unemployment and out of the labor force<sup>7</sup>, this is a significant channel. In addition, lower migration net inflows from Venezuela in response to the border closure reduce the working age population and lower effective labor supply, as Venezuelan migrants tend to have higher human capital than local workers (2020 SIP).
- *Investment channels.* Capital accumulation and efficiency will slow down in response to the fall in investment seen in 2020 and capital underutilization may also occur in response to firm destruction or as firms halt production in response to mobility restrictions imposed to address the pandemic.
- *Sectoral channels.* There can also be composition effects beyond the impact on capital and labor efficiency, as sectoral reallocation and network effects lead to a temporary underutilization of capital and labor, affecting TFP. Similarly, cuts to R&D could result in future lower productivity.

**5. The pandemic brought about historic falls in labor, capital and output.** Recessions are relatively uncommon in Colombia. Since 1975, there had only been one recession prior to the pandemic, though there had been episodes where growth had slowed down, with falls in investment and employment. The recession of 1999-2000 is the closest comparable recession with falls in investment comparable (-41 percent yoy in 1999Q2) to those seen during the height of the pandemic (-40 percent yoy in 2020Q2). There were also notable drops in investment during the mid-1970s, mid-1980s and in the aftermath of the 2014-16 oil price fall. For unemployment, where the data is less comparable and does not extend as back into the past, there were gradual increases in the unemployment rate starting in the mid-1990s and peaking in the 1999-2000 recession as well as moderate increases in the aftermath of the global financial crisis of 2008-09 and the oil price drop.

<sup>6</sup> As noted by Bodnar and others (2020), the impact of the lockdown on potential output can depend on its interpretation. As lockdowns are implemented and production ceases, both the capital and labor input will be underutilized, and hence the amount of slack would be large. Under this interpretation, potential output would not be affected by the pandemic much. Another interpretation however is that since none of the factors of production are available to produce output, then the impact on the output gap would be small as potential declines in line with the fall in output. In this work we interpret potential output as that one that does not put any pressure on prices.

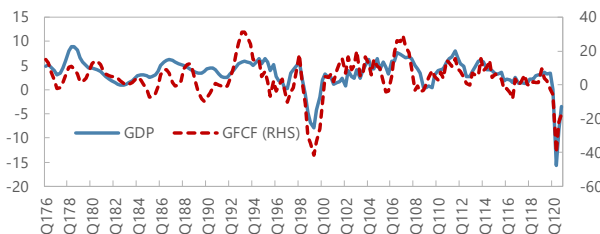
<sup>7</sup> See selected issues chapter on labor markets.

**Unemployment Rate**  
(Percent)



Source: DANE, Haver

**Growth Rates of GDP and GFCF**  
(Percent)

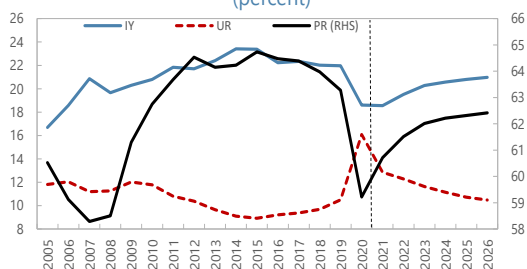


Source: DANE, Haver, OECD

**6. GDP projections and its historical relationship with capital and labor inputs are used to determine the impact of the pandemic on potential output.** Various approaches are used to project capital and labor inputs given a projected path for GDP after 2020. Projections for capital were made using an estimated investment equation as the benchmark that includes the price of oil, GDP and the user cost of capital.<sup>8</sup> In the case of labor inputs both an Okun’s law equation was estimated as well as a vector autoregression or VAR.<sup>9</sup> All regressions are estimated to 2019Q4 and forecasts are produced for 2021-26 based on observed data for 2020 (initial conditions), exogenous forecasts for the price of oil, GDP and the user cost of capital. The projections point to a gradual increase in the investment to GDP ratio and in the participation rate, whereas the unemployment rate is projected to decline slowly towards pre-pandemic levels.

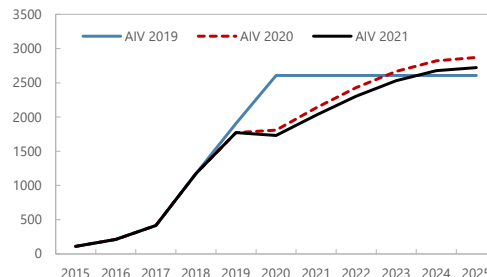
**7. The projections for labor incorporate updated projections for Venezuelan migration.** With the closure of the border, the number of migrants from Venezuela in Colombia declined slightly in 2020 (by around 40 thousand) as some migrants returned to Venezuela in response to the deteriorating economic outlook in Colombia during the national lockdown. The reduction in the number of migrants represents around 2 percent of all migrants, with a small impact on potential output relative to the projections discussed at the time of the 2020 Article IV. Staff assume that the border with Venezuela will open in the second half of 2021 with modest arrivals thereafter relative to the trends observed before the pandemic.

**Capital and Labor Input**  
(percent)



Source: DANE and IMF staff calculations

**Migration from Venezuela**  
(thousands)

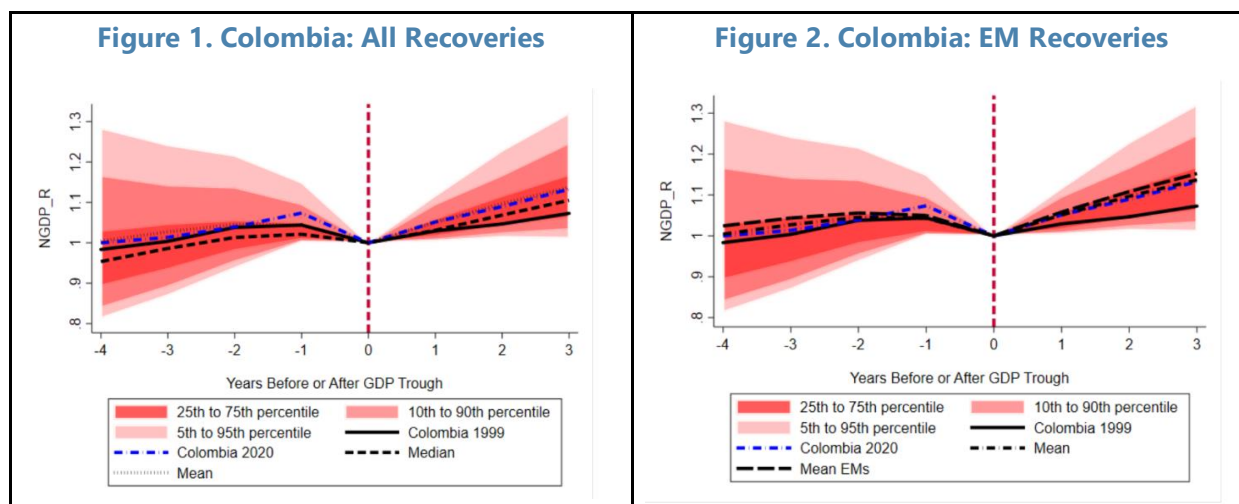


Source: National authorities and IMF staff estimates.

<sup>8</sup> See Annex for details.

<sup>9</sup> See Annex for details.

**8. Past downturns provide a useful benchmark to evaluate the GDP projections.** Although uncertainty is high, staff projections are informed by the observed experience of past recessions in both advanced and emerging economies since the 1970. Around 400 recessions and recoveries for both advanced and emerging economies since 1970 are compared against the projected recovery.<sup>10</sup> Despite the unusual recession associated with the pandemic, staff assume as Figures 1 and 2 show, that the projected recovery is not too dissimilar to those in other countries but stronger than the recovery from the last recession in Colombia in 1999–2000.<sup>11</sup>



## D. Main Findings and Conclusions

**9. Potential GDP is estimated to have contracted in 2020, though there is considerable uncertainty about the estimates.** Estimates of the impact on potential output growth range from around  $-3\frac{1}{2}$  percent (production function approach) to around  $-1\frac{1}{2}$  percent (SSNK) in 2020, with the MVF in between around  $-1$  percent. For both the PF and MVF, the decline is driven by the fall in the labor input and to a lesser extent lower capital.

**2020 Potential Output Estimates (Percent)**

	Y*	K* (cont.)	L* (cont.)	TFP
<b>PF</b>	-3.7	-0.6	-4.6	1.5
<b>MVF</b>	-1.1	-0.9	-1.6	1.3
<b>SSNK</b>	-0.3	na	na	na

While potential growth falls for both the MVF and SSNK in response to estimated supply shocks with the lockdowns to mitigate the spread of the virus, the decline in inflation in 2020 points to

<sup>10</sup> This approach is based on Howard et al. (2011) who are specifically interested in explaining recoveries after accounting for the characteristics of the previous boom and the subsequent recession. Howard et al find that, in line with the literature, (i) deeper recessions are followed by steeper recoveries, (ii) recessions accompanied by favorable commodity terms of trade are followed by steeper recoveries, (iii) long recessions tend to be followed by weaker recoveries, and (iv) high levels of credit to GDP are followed by weaker recoveries. GDP is thus normalized at the trough (which does not rule out implicitly comparing results several years after the trough to the pre-crisis peak).

<sup>11</sup> For the PF approach, in line with Bodnar and others (2020), the impact of the pandemic is evaluated by filtering the data for 2020 and the projections up to 2026. For the MVF and the SSNK, only projections for 2021 and 2022 are used.



additional demand shocks on output. These demand-side factors explain about half of the fall in the GDP in 2020 and hence point to an opening output gap of around 7 percent for the MVF and 8 percent for the SSNK. In comparison, the PF points a less open output gap of around -4½ percent.

**10. Potential output is projected**

**to partly recover in 2021.** In line with the projected recovery in

employment, potential output is

projected to recover between ½

percent (PF) to 2½ percent (SSNK).

While both employment, TFP and oil

prices are estimated to contribute to the recovery in potential output, this is not the case for capital, reflecting the delayed impact of the sharp investment contraction in 2020. Going forward, in line with staff's projected gradual recovery of GDP, employment and investment, potential output growth is expected to gradually return to its pre-pandemic growth rate of between 3 and 3½ percent.

**11. The fall and gradual recovery in employment is the key driver of the contraction of potential output in 2020 and of its estimated recovery in 2021.**

The pandemic and associated mobility restrictions to deal with the pandemic resulted in historical declines to employment and investment which are estimated to have led to a fall in potential output. The employment and investment recoveries from 2021 are expected to support a gradual rebound in potential.

**2021 Potential Output Estimates**

**(Percent)**

	<b>Y*</b>	<b>K* (cont.)</b>	<b>L* (cont.)</b>	<b>TFP</b>
<b>PF</b>	0.7	-0.1	0.9	0.0
<b>MVF</b>	1.5	-0.1	1.0	0.6
<b>SSNK</b>	2.7	na	na	na

## Annex I. Estimated Equations and Model Descriptions

### A. VAR Estimation for Capital and Labor Inputs

1. **A Vector Error Correction model (VECM) was estimated comprising the capital stock, gross fixed capital formation, GDP and the price of oil (assumed exogenous).** Cointegration tests point to the existence of two cointegrating relationships and restrictions were imposed to identify them, taking inspiration from Ellis and Price (2002) who also identify two cointegration relationships in the UK relating the capital to investment ratio (reflecting the capital accumulation equation) and the capital to output ratio (reflecting the first order condition for the use of capital):

$$k = y - \sigma uc + \theta \quad (1)$$

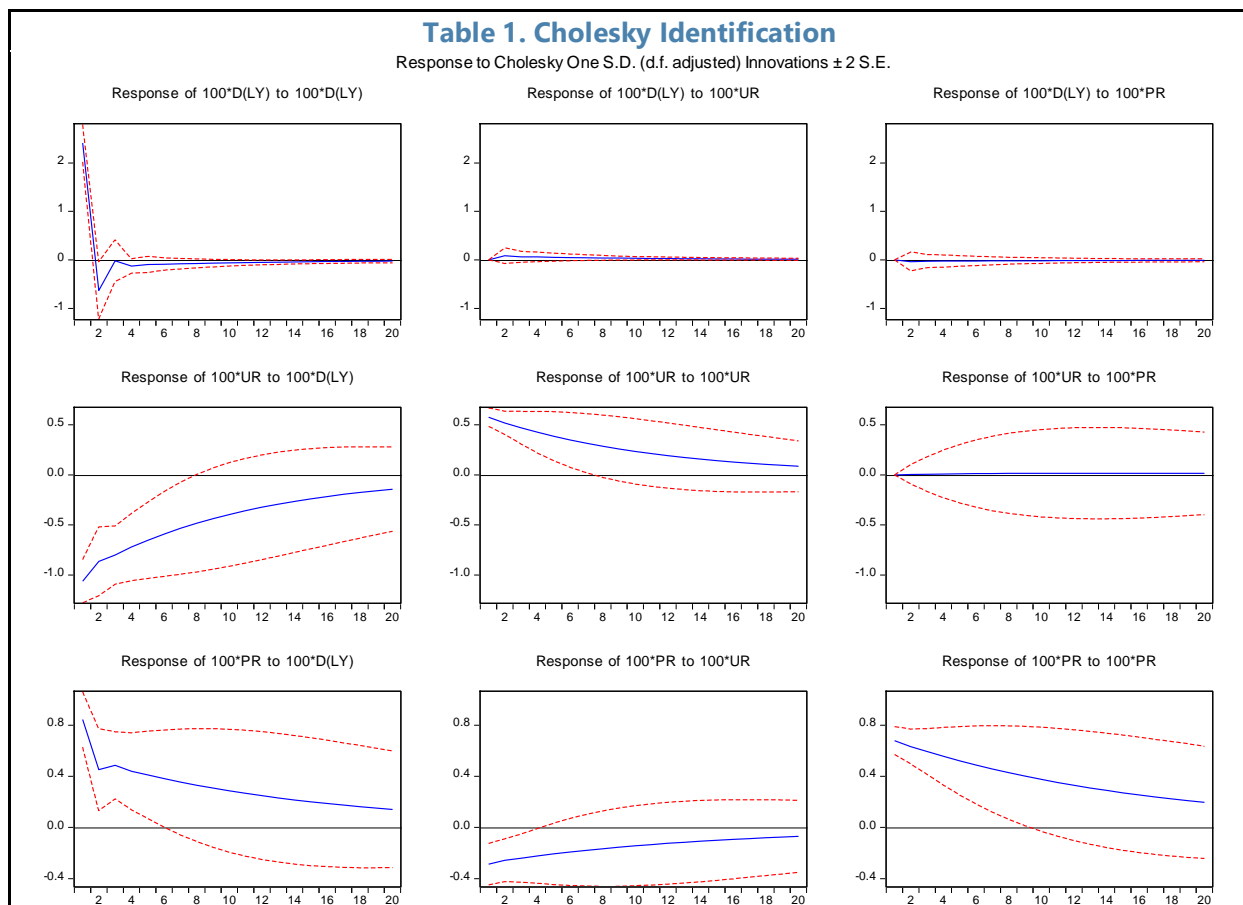
$$k = i - \ln(\delta + g) \quad (2)$$

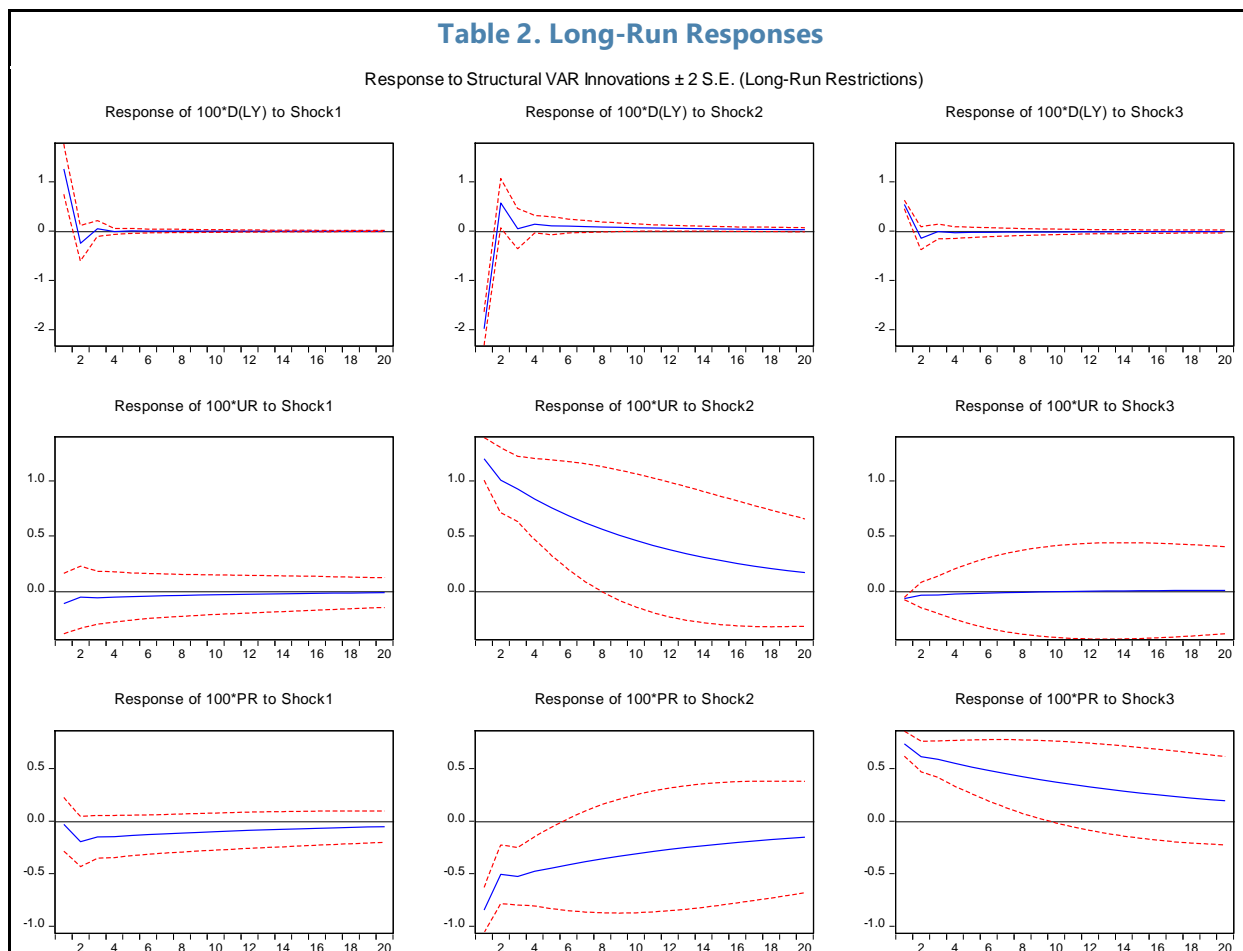
where  $k$  is the capital stock,  $i$  is investment,  $y$  is GDP and  $uc$  is the user cost of capital. The long-run and error correction estimates, as well as the dynamic impact of the oil price, are presented in the table below (dynamic coefficients are not reported):

**Figure 1. Colombia: Estimated VECM for Investment, Capital, GDP and The User Cost**

Sample (adjusted): 2005Q3 2019Q4 Included observations: 58 after adjustments Standard errors in ( )				
Cointegration Restrictions: LR test for binding restrictions (rank = 2): P-Value 0.201470				
Cointegrating Eq:	CointEq1	CointEq2		
LOG(INV(-1))	-1.000000	0.000000		
LOG(GDP(-1))	0.000000	-1.000000		
LOG(K(-1))	1.000000	1.000000		
UC(-1)	0.000000	2.829766 (1.08750)		
C	-2.361300 (0.02520)	-1.349547 (0.15971)		
Error Correction:	D(LOG(INV))	D(LOG(GDP))	D(LOG(K))	D(UC)
CointEq1	0.344568 (0.08995)	-0.053629 (0.01655)	-0.021560 (0.00934)	0.051414 (0.02515)
CointEq2	0.001307 (0.06508)	-0.018184 (0.01197)	-0.011431 (0.00676)	-0.036447 (0.01820)
DLOG(POIL(-1))	-0.021542 (0.02941)	0.010224 (0.00541)	-0.004273 (0.00305)	0.014421 (0.00822)
R-squared	0.271359	0.323323	0.666137	0.164513
Adj. R-squared	0.185636	0.243714	0.626859	0.066221

**2. A VAR comprising GDP, the unemployment and participation rates was estimated. A** Cholesky and long-run identification (Blanchard-Quah) schemes are considered to evaluate the impact on the labor variables to different identified shocks. The impulse responses are shown below. Under both identification techniques, unemployment and participation both take a long time to return to its pre-shock levels (over twenty quarters). The first column of the Cholesky identification and the second column of the long-run restrictions (Shock 2) are consistent with demand-type shocks, and the first column of the long-run restriction (Shock 1) is consistent with a supply-type shock. Other shocks have a less forward interpretation, though they could be considered as unemployment or labor force participation shocks. Nonetheless, these other columns also point to sluggish responses in the labor market.





## B. MVF and SSNK Key Equations

**3. The MVF model is based on Alichí and others (2017) which exploits information from GDP, inflation, unemployment and capacity utilization.** The key equations on the supply side are:

$$y_t^* = y_{t-1}^* - \varepsilon_1(u_t^* - u_{t-1}^*) + \varepsilon_2(capu_t^* - capu_{t-1}^*) + g_t^* + \epsilon_t^y \tag{3}$$

$$g_t^* = (1 - \gamma)g_{t-1}^* + \gamma g_{ss}^* + \epsilon_t^g \tag{4}$$

where  $y^*$  denotes potential output,  $u^*$  is the NAIRU,  $capu^*$  is the equilibrium capacity utilization rate,  $g^*$  is potential growth and  $\epsilon$  are shocks to the level and growth rate of potential. The model identifies the output gap using a Phillips Curve for inflation and both the unemployment and capacity utilization gaps are assumed to be proportional to the output gap. Additionally, the structural unemployment (NAIRU) and capacity utilization equations are assumed to have an autoregressive structural with their own shocks. The model is estimated using annual data.

**4. The SSNK model is based on Gonzalez and others (2015) which exploits information from GDP, inflation, and oil prices.** The key equations on the supply side are:

$$y_t^* = y_{t-1}^* + g_t^* \quad (5)$$

$$g_t^* = (1 - \gamma)g_{t-1}^* + \gamma g_{ss}^* + \omega(\Delta \text{poil}_t^* - \Delta \text{poil}_{ss}^*) + \epsilon_t^g \quad (6)$$

where  $\Delta \text{poil}$  is the growth of the equilibrium oil price, which is assumed to have an autoregressive process. As for the MVF model, a Phillips Curve for inflation helps to identify the output gap. The model is estimated using quarterly data. The model also incorporates a Covid-19 specific shock that can affect both demand, potential output and inflation in line with recent literature (e.g. Guerrieri and others, 2020 or Baqaee and Farhi, 2021).

**5. A subset of model shocks is used to identify the impact on potential using data and projections for key data.** Both models use data and projections for GDP, inflation, the policy rate and the exchange rate. Unemployment and capacity utilization are also used in the MVF, and the oil price in the SSNK.

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