COLOMBIA

SELECTED ISSUES

May 2018

This Selected Issues paper on Colombia was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on April 16, 2018.

Copies of this report are available to the public from

International Monetary Fund • Publication Services
PO Box 92780 • Washington, D.C. 20090
Telephone: (202) 623-7430 • Fax: (202) 623-7201
E-mail: publications@imf.org   Web: http://www.imf.org
Price: $18.00 per printed copy

International Monetary Fund
Washington, D.C.

INTERNATIONAL MONETARY FUND

COLOMBIA

SELECTED ISSUES

April 16, 2018

Approved By	Prepared by S. Lanau, D. Rodríguez-Delgado and
Western Hemisphere Department	F. Toscani (all WHD), and Zsuzsa Munkacsi (SPR)

CONTENTS

THE OUTLOOK FOR EXPORT GROWTH IN COLOMBIA[1]

Over the past few years, weak trading partner growth has offset the positive impact of a large real exchange rate depreciation and held back Colombian exports. Staff analysis shows that an improved global outlook and the lagged effects of the depreciation will push export growth higher over the coming years, especially if the authorities address long-standing bottlenecks in infrastructure and reduce non-tariff barriers to trade.

A.   Introduction

1.   The real exchange rate has depreciated 30 percent from its peak in 2012. This chapter sheds light on how much of a boost to exports this could represent by exploring the response of exports to fundamentals, the behavior of non-traditional exports in past large depreciations in commodity exporters, and Colombia's structural bottlenecks to international trade. Estimates suggest that low trading partner growth has so far offset the boost to export growth from the depreciation to a large degree. But going forward, higher regional and world growth should support exports, including non-traditional exports which are found to react only with a long lag to depreciations. Reducing non-tariff barriers and improving transportation and infrastructure are key steps to support nascent export growth and diversification.
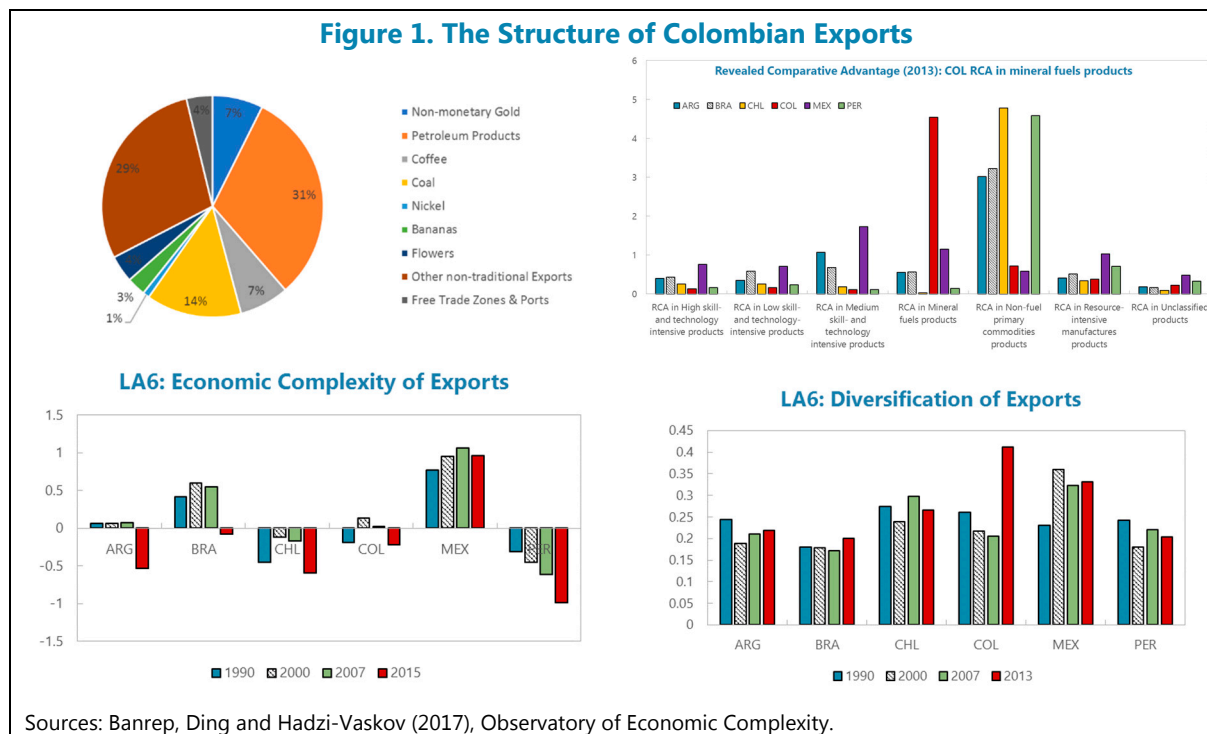
B.   The Structure of Colombian Exports

2.   Colombian exports are largely concentrated in oil and other commodities and are not very diversified (Figure 1).

- Traditional products, broadly defined as oil, metals, and raw agricultural products, account for around 60 percent of nominal exports.

- Colombia has a strong Revealed Comparative Advantage (RCA) in oil but is weak by LA6 standards in technology-intensive products (Ding and Hadzi-Vaskov, 2017).[2] The complexity of Colombian exports, as measured by the Hausmann (2013) method, is in line with the LA6 average and has not changed much over the years.

- The Herfindahl concentration index shows that Colombia was the least diversified country in LA6 in 2013, following the large increase in oil exports in 2007−13.

- Despite the predominance of commodities and low-complexity products, the large real depreciation and moderate outlook for commodity prices offer an opportunity to grow nontraditional exports substantially.

---

[1] Prepared by Sergi Lanau and Frederik Toscani (all WHD).

[2] See Annex I for technical definitions of the export metrics in this paragraph.

Figure 1. The Structure of Colombian Exports

Sources: Banrep, Ding and Hadzi-Vaskov (2017), Observatory of Economic Complexity.

C.   Recent Export Performance and Outlook

3.   Despite the large depreciation, the increase in exports since 2016 has been moderate.
This could reflect weak trading partner demand, a delayed response of exports to the depreciation,
weak commodity prices, or structural impediments to export growth regardless of relative prices.

Figure 2. Real Exchange Rate and Exports

Sources: Banrep and DANE.
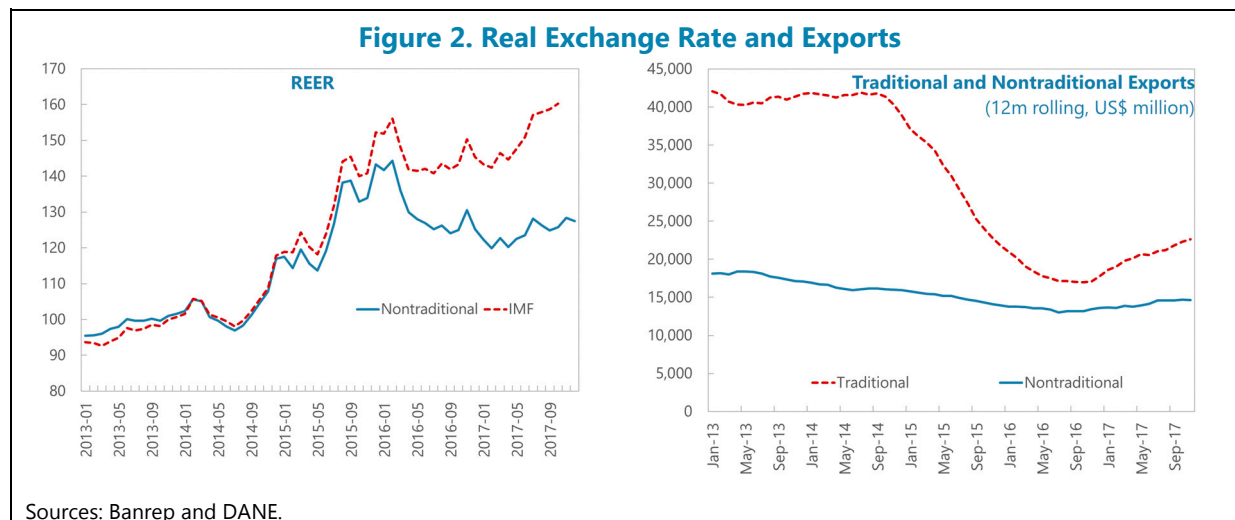
**4.   Staff modeled export volume growth as a function of commodity prices, the REER, and
trading-partner growth to assess export performance more formally** (Annex I details the
methodology). Quarterly data since 2001 for 23 countries was used in order to put Colombia's
performance in international perspective. The coefficients in the model are estimated using data for

2001Q1−2014Q2 and used to forecast export growth in 2014Q3−2017Q4. The difference between this forecast and observed export growth is a measure of export over/underperformance relative to the historical relationship between exports and fundamentals.

5. **According to the model, Colombia's export performance in recent years has been broadly in line with fundamentals but somewhat weaker than suggested by historical relationships** (Figure 3). A number of countries overperformed significantly but others, including other commodity exporters in Latin America fared worse than Colombia. In other words, weak export growth is not the result of strong underperformance. It reflects the relatively adverse external conditions Colombia has faced: commodity prices remained depressed and trading partner growth was weak, especially in Ecuador and Venezuela.

Figure 3. Export Growth Over- and Underperformance

Sources: Authorities and Fund staff calculations.
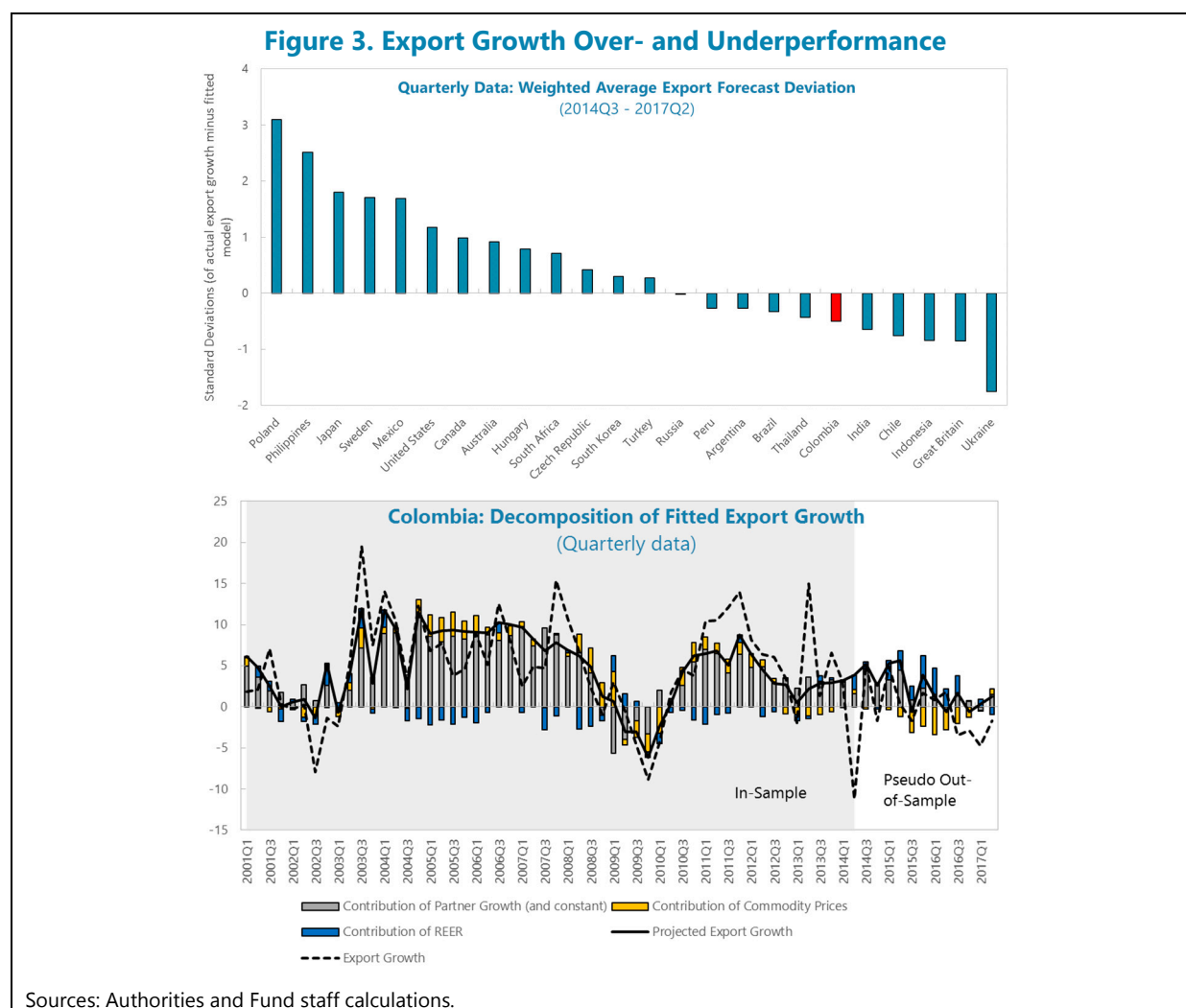
6. **The export elasticities derived from the model suggest that weak trading partner growth has largely offset the positive effects of the real depreciation.** The Colombia model elasticities of exports to trading partner growth and the REER are 2.2−2.6 and -0.1, respectively. Trading partner growth in 2015−17 was about a percentage point below pre-2008 values. This

would translate into a 2.2–2.6pp decline in export growth. In contrast, the 30 percent real depreciation Colombia has experienced would increase export growth by about 3pp—with the two essentially offsetting each other.

7.   Going forward, the model projects average quarterly year-on-year export growth of around 3 percent in Colombia for 2017Q3–2018Q4. This would be a substantial acceleration from the -1.7 percent growth rate observed in 2016Q1-2017Q2 and would support staff's medium-term improvement in the trade balance.

D.   A Deeper Look at Nontraditional Exports

Colombia lost nontraditional export market share in 2000–15 but the loss was due to very weak growth in Ecuador and Venezuela—two main nontraditional export destinations (Figure 4).[3] The gap between the total market share and the market share excluding Ecuador and Venezuela is the largest for manufactures. Nontraditional trading partner growth is projected to improve in coming years but will remain substantially below total trading partner growth. However, this intensive margin excludes new markets that would be opened elsewhere (the extensive margin).

Figure 4. Nontraditional Export Market Share

Sources: COMTRADE and IMF WEO.
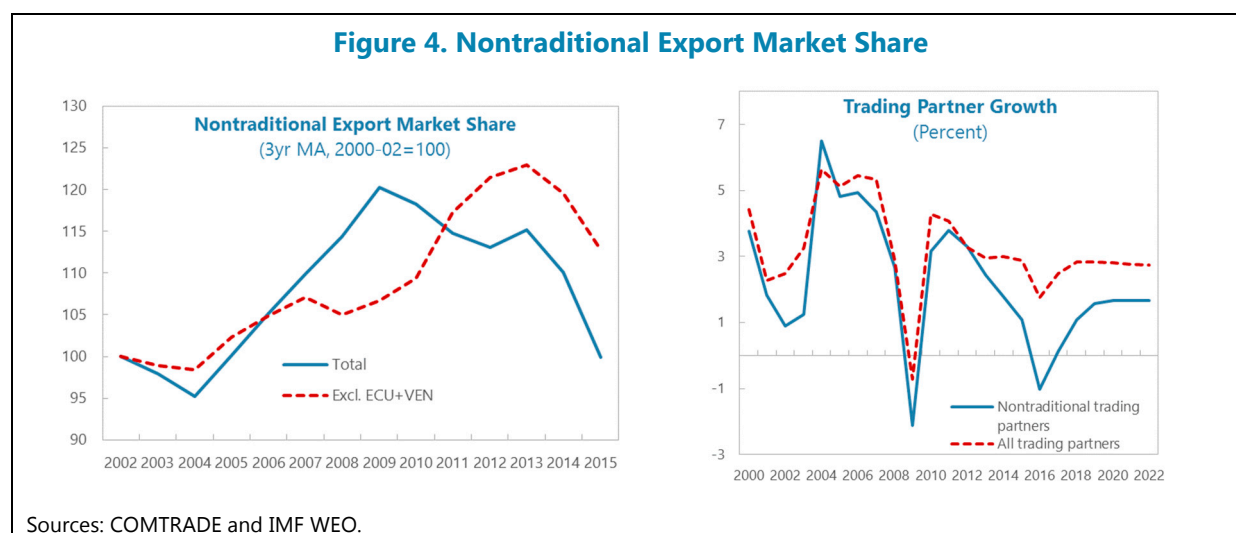
8.   The real depreciation will be supportive of nontraditional exports. The April 2017 Western Hemisphere REO found that export performance responds more significantly to changing relative prices for noncommodity products, especially manufactures. Lanau (2017b) finds that a 10 percent depreciation increases value added growth of the nontraditional sector by about 0.8pp, mostly through the export channel. The effects are significant on impact but take three years to materialize in full.

---

[3] The analysis in this section is fully based on export market shares constructed from nominal export data as export volume data for nontraditional products are not available. The nontraditional export market share is the ratio of Colombia's nontraditional exports to global nontraditional exports.

9. **Historical experience suggests that commodity exporters manage to increase their nontraditional export market share following large real depreciations** (Figure 5).

- Staff analyzed the behavior of nontraditional export market shares in a sample of 61 large depreciations (17 in LA) in 53 commodity exporters in 1985–2015. Large depreciations are defined as a REER depreciation of at least 20 percent in two years that is not fully reversed in the third year. Episodes where a second large depreciation occurs in less than five years are excluded.

- The median commodity exporter improves its market share by 9 percent in the three years following a large depreciation but the gains dissipate somewhat for a cumulative gain of 4.8 percent in five years. For the median country, the real depreciation is largely permanent. These depreciations are generally accompanied by lower commodity prices but commodities continue to dominate the overall export basket (for the median country, the share of commodities in total exports falls by just two percentage points).

**Figure 5. Response of Nontraditional Market Share to Large Depreciations 1/**
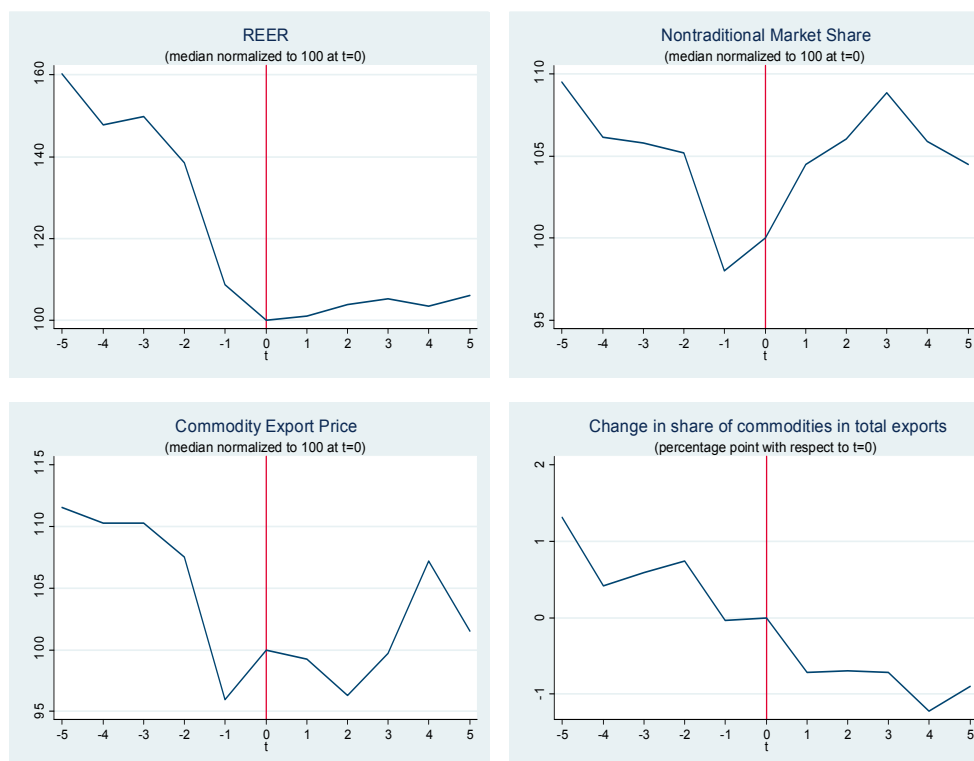
Source: COMTRADEl and IMF IFS.

1/ Time in years. T=0 is the year when the large depreciation is completed.

10. **If Colombia tracked the median commodity exporter experiencing a large depreciation, cumulative nontraditional export growth in 2015–20 would reach 30 percent.** This would improve the current account by about 0.25pp (assuming imports do not increase). The calculation is based on the 4.8 percent improvement in the market share mentioned above and the WEO assumptions for global trade growth. Nontraditional export growth and the resulting improvement in the current account could be substantially higher if Colombia performed better than the median episode and closer to the top quartile in the sample.

Figure 6. Projected Nontraditional Export Growth
(Percent)
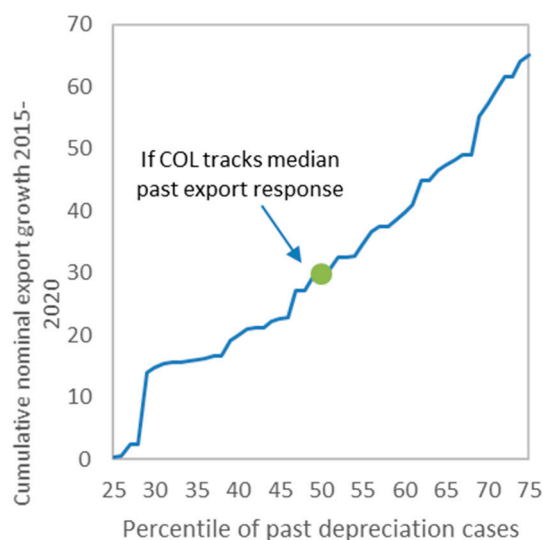
Sources: COMTRADE and IMF WEO.

E. Structural Impediments to Export Growth

11. **Factors other than relative prices and external demand are also relevant for export growth in Colombia.** This section explores the role of tariffs and possible structural bottlenecks such as infrastructure and customs procedures.

12. **Tariffs are low by regional standards, yet higher than the OECD average and heterogeneous across products** (Figure 7). Average tariffs have fallen significantly in recent years to around 6.5 percent, narrowing the gap to the OECD average to about 1.5 percentage points. Tariff dispersion is relatively high across sectors but especially so in agriculture, where productivity happens to be low. Nominal tariffs on agricultural products average 18 percent but they are as high as 49 and 70 percent for dairy and beef products for example (Fedesarrollo, 2017).

Figure 7. Tariffs

Average Tariffs

Tariff rate, most favored nation, simple mean, all products (%)
Tariff rate, applied, simple mean, all products (%)

Average Tariff Rates
(Most favored nation all products, percentage)

PER · OECD · CHL · COL · URY · BRA · ARG

Tariff dispersion
(Standard deviation)

CHL · PER · EU · JPN · CAN · CHN · PHL · MYS · COL · BRA · ARG · USA · MEX · IND · THA
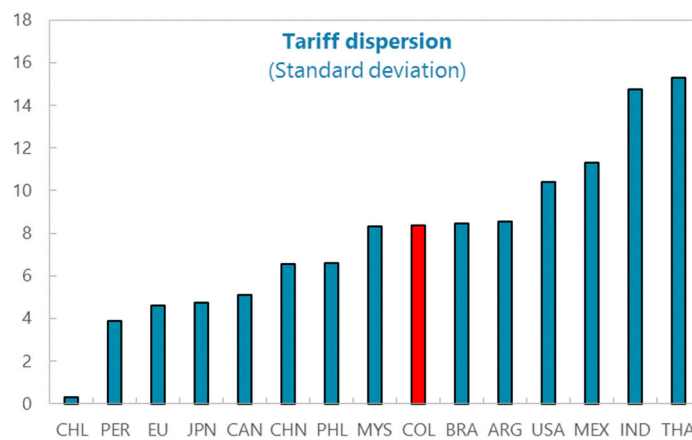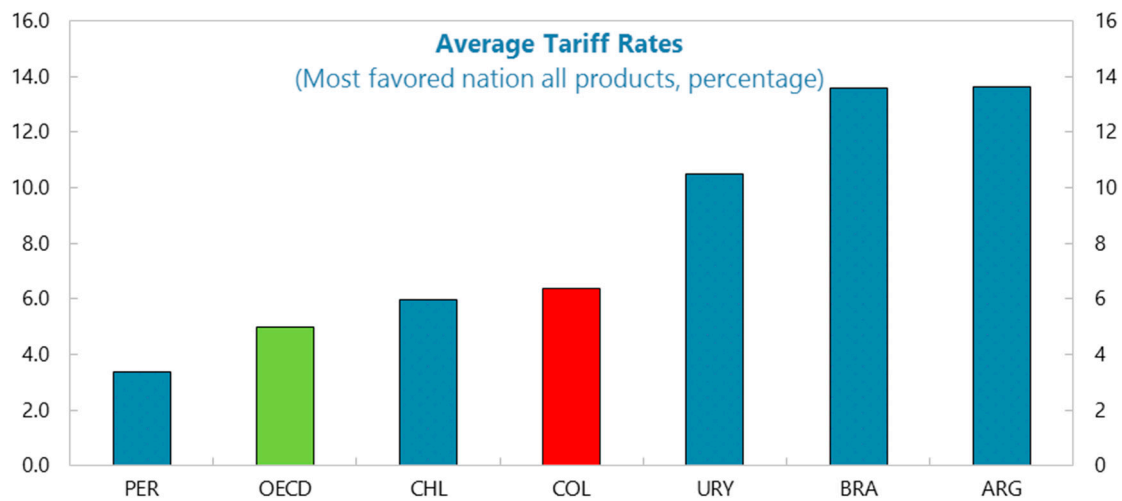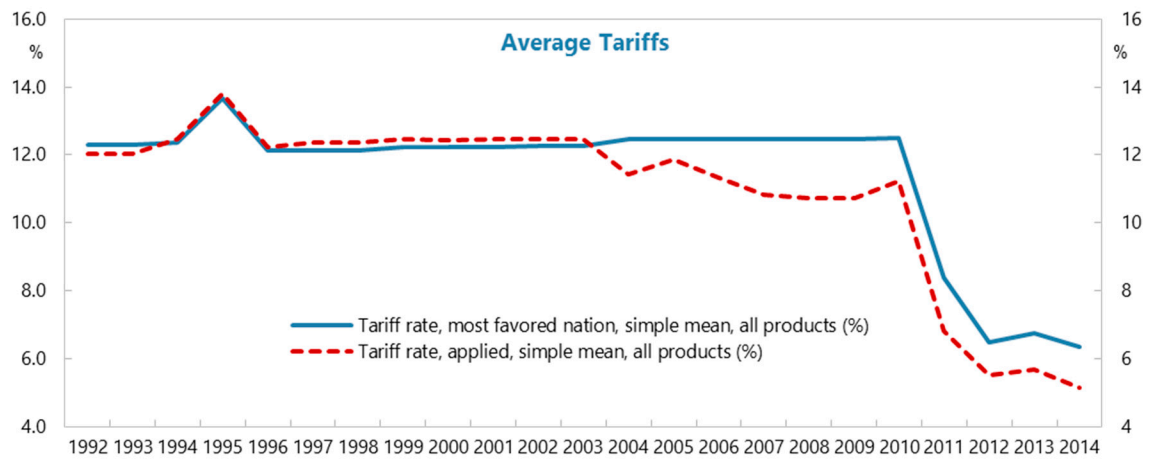
Sources: OECD, UN TRAINS.

13.   Nontariff costs account for three quarters of the cost of imports, acting as a barrier to exports since exporters often use imported inputs. Garcia and others (2016) find that the cost of importing was 36 percent of a product's price in 2012. Three areas stand out in terms of nontariff costs.

- ***Non-tariff barriers***. Garcia and others (2016) document the existence of extensive nontariff measures on imports such as inspections and permits. The number of nontariff barriers per product category grew from four in 2001 to 16 in 2014. For categories such as textiles and wood products, 100 percent of the imported value is subject to nontariff measures. Establishing whether non-tariff measures are optimal is difficult but their case study on wine imports shows that measures such as departmental stamps likely restrict competition unduly.

- ***Infrastructure and transportation***. As discussed in Lanau (2017) the infrastructure gap in Colombia is significant, adding to the cost of transporting goods from/to the border. 4G infrastructure projects have the potential to close the gap considerably. Inefficient service providers also add to road transportation costs. The bargaining power of truck drivers is high, as are barriers to entry. Rules and regulations have resulted in an old truck fleet, many inefficient one-truck companies, and restrictions on truck ownership. Surveys of exporters confirm the importance of these issues. 75 percent of respondents say freight prices and bad roads are a top impediment to trade.

- ***Customs procedures***. Colombian customs are relatively slow according to World Bank data (Figure 8), especially when it comes to exporting. The authorities have been making progress, however, with new scanners in ports and accelerated processing times.

Figure 8. Time to Import and Export

Source: World Bank.
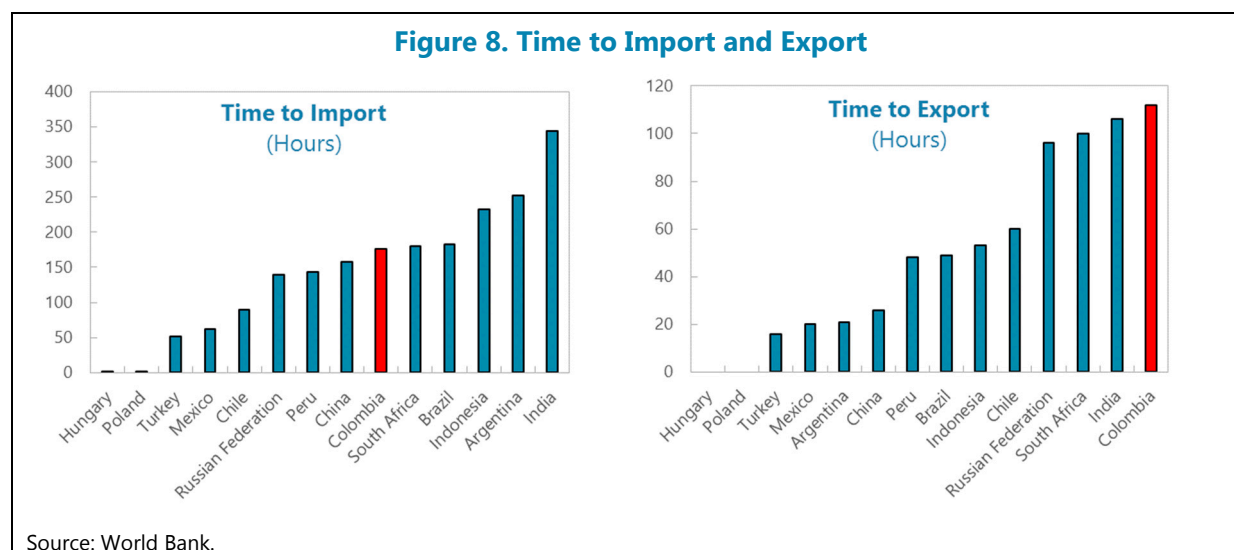
F.   Conclusion

14.   Colombian exports are heavily concentrated in commodities but the large real depreciation since 2015 offers an opportunity to grow nontraditional exports substantially. Colombia's comparative advantage in noncommodity products was weak in 2013−15 and export diversification was low, partly due to the commodity price boom.

15.   Exports grew moderately in recent years but in line with historical relationships given fundamentals. Weak export growth is not the result of underperformance. It reflects adverse external conditions such as low oil prices and weak trading-partner growth, especially in Ecuador and Venezuela. Weak trading-partner growth has largely offset the positive effects of the real depreciation, especially for nontraditional exports. The time needed to open new markets and reopen others lost during the commodity boom suggests a substantial delay in the pick-up of nontraditional export growth.

16.   The export outlook is positive. Given global growth assumptions, staff's models predict an acceleration in export growth. The historical experience of commodity exporters suffers large real depreciations also paints a positive picture. The median commodity exporter manages to increase its nontraditional export market share by 4.8 percentage points in five years. In Colombia, this would imply cumulative nominal export growth of 30 percent in 2015−20.

17.   Structural factors may also be behind sluggish export growth. The main structural impediments to export growth are high tariff dispersion, proliferation of nontariff barriers, deficient infrastructure, inefficiencies in the market for road transportation, and slow customs procedures.

18.   In sum, a rapid correction of structural impediments to export growth, combined with the authorities' efforts to disseminate information about a number of trade agreements, would speed up and further support export growth in the medium term.

Annex I. Technical Details

Definitions of Export Metrics

- **Revealed Comparative Advantage (RCA)** is calculated as the share of export j in total exports of country i over the share of product j exports worldwide in total worldwide exports.

- **Hausmann Complexity of Exports Index:** The methodology captures the diversity (how many products) and ubiquity (do many countries produce this good) of country i's exports. For details on the methodology see Hausmann et al. (2013).

- **Herfindahl Concentration Index** is calculated as the squared sum of the share of export j in total exports of country i.

Export Performance Model

1.   **Similarly to IIF (2017), we estimate $x_{it} = \alpha_i + B(L)reer_{it} + C(Q)cp_{it} + D(P)pg_{it} + \epsilon_{it}$ country by country.** x_{it} is export volume growth in percent for country i in quarter t, $B(L)$, $C(Q)$ and $D(P)$ are l, q and p-order lag polynomials, $reer$ is the percentage change in the real effective exchange rate, cp is the percentage change in the commodity price index, and pg is export-weighted real GDP growth in partner countries. For Colombia, the regressions include dummies for 2013Q2 and 2014Q2 to capture the erratic large spike in the former and trough in the latter.

2.   **We estimate four different models and then obtain a final summary measure of export over/underperformance by taking a weighted average of the results of each individual model (weights are based on the root mean square error of the models).** Last, we divide this number by the count of quarters we forecast to obtain the weighted average export forecast deviation by country. The models use the same lag structure for all countries but the structure changes between models.

References

Ding, Xiadodan and Metodij Hadzi-Vaskov, 2017, "Composition of Trade in Latin America and the Caribbean," IMF Working Paper No. 17/42 (Washington: International Monetary Fund).

Hausmann, Ricardo, et al., 2013, "The Atlas of Economic Complexity: Mapping Paths to Prosperity," 2nd ed., Cambridge: MIT Press.

Perfetti, Juan Jose, Jesus Botero, Sandra Oviedo, David Forero, Sebastian Higuera, Manuel Correa and Jose Garcia, 2016, "Politica commercial agricola: nivel, costos y efectos de la proteccion en Colombia," Bogota: Fedesarrollo.

Garcia, Jorge, David Camilo Lopez, and Enrique Montes, 2017, "Los costos de comerciar en Colombia: aproximación basada en una comparación de precios," Banco de la Republica Borrador No. 974.

Lanau, Sergi, 2017a, "The Growth Return of Infrastructure in Latin America", IMF Working Paper No. 17/35 (Washington: International Monetary Fund).

_____, 2017b, "The Sectoral Effects of Real Depreciations in Latin America", IMF Working Paper No. 17/249 (Washington: International Monetary Fund).

INFORMALITY IN COLOMBIA[1]

Colombia made impressive progress in reducing informality over the last decade, with strong policy measures and improvements in education playing an important role. Going forward, further lowering the costs of formality (such as non-wage labor costs and firm registration costs) and building on the expansion in education would help consolidate the positive trend.

A. Introduction

1.   Colombia has achieved a significant reduction in labor informality over the past years. The share of workers nationwide who are not contributing to social security dropped from 70 percent in Q1 2007 to 62.3 percent in Q3 2017. The level remains high but relative to other countries in the region the informality rate is broadly in line with Colombia's GDP per capita.

2.   A number of policy measures have contributed to this decline. Among a large number of formalization initiatives, such as the 2006 Entrepreneurship Law and the 2010 Formalization and Job Creation Law, the 2012 Tax Reform stands out as having been particularly important in pushing formalization by cutting payroll taxes by 13.5 percentage points from close to 30 percent for workers earning below 10 minimum wages. Available impact evaluations suggest that the tax reform led to several hundred thousand additional formal jobs being created and reduced labor informality.

3.   A decomposition of the fall in informality suggests that an improvement in the skill level of the labor force has also been crucial. As in all countries, informality in Colombia decreases sharply with education levels. Indeed, 85 percent of workers with postgraduate education are formal, but only 9 percent of those without any education are. Over the last 10 years, the formality rate for most education levels has increased modestly (e.g., from 6.7 to 9.3 percent for uneducated workers) but the largest gains are due not to improvements *within* education groups, but due to an increase in the average *level* of education. The latter accounts for two-thirds of the fall in labor informality between Q1 2007 and Q2 2017.

4.   A simple exercise at the subnational level further highlights the role of education for informality. Using informality and education data for the 23 largest cities, and their corresponding departments we find that a higher score on the higher education index constructed by the Ministry of Education explains between 44–49 percent of the cross-sectional variation in informality far outperforming even GDP per capita in terms of explanatory power. This is compared to 1–5 percent of the variation being explained by regional differences in the World Bank Doing Business index, for example.

5.   A continued focus on providing high quality education is key for further gains in productivity and formality of the labor force. Skill mismatches, especially at the technical level, remain large. Further strengthening the coverage and quality of education by building on the

---

[1] Prepared by Frederik Toscani (WHD) and Zsuzsa Munkacsi (SPR).

expansion of higher education coverage from 37 percent in 2010 to 52 percent of the age cohort in 2017 is crucial. Keeping in mind fiscal constraints, initiatives could include a focus on the supply of higher education as well as programs to support access for students from low income families.

6.   **A range of structural reforms would also help reduce informality further.** First, non-wage labor costs remain high even after the 2012 tax reform. Employers are required to pay a four percent payroll tax to finance so-called *Cajas de Compensación Familiar* which bundle a wide range of services from housing and education to sports and entertainment. Alternative sources of financing for the *Cajas* would be preferable and the services they provide could be reviewed to avoid duplication with other government programs. Second, given large regional differences in human capital, labor productivity varies strongly and the national minimum is much more binding in some regions than others, fomenting informality where it is binding. A regionally differentiated minimum wage could be considered. Third, reducing registration fees for the *registro mercantil* for small firms and cutting red tape through the *Ventanilla Unica Empresarial* would also improve firm formality.

7.   **Staff simulations suggest that additional labor market reforms, as well as further cutting firm entry costs, could indeed lead to lower unemployment and informality in the long run.** Staff calibrated the SPR STRESS model[2] which is based on one of the key tradeoffs of informality for firms—formal firms have access to larger markets (such as exporting and supplying the government), while informal firms avoid labor and product market regulations and taxes which the formal sector needs to adhere to. Simulations show that permanently cutting entry costs in the formal sector, or labor market reforms such as lower formal-sector workers' bargaining power and reducing payroll taxes leads to a steady state with lower informality and higher GDP, supporting the case for reforms as set out above. Previous related work in the literature suggests that combining reforms in a package and sequencing labor market reforms prior to product market reforms is often more beneficial.

8.   **The remainder of this chapter proceeds as follows.** Section B defines informality and clarifies how we think about informality in Colombia for the purpose of this chapter. Section C presents stylized facts on informality in Colombia and Latin America, while section D elaborates on some of the key structural factors underlying informality in Colombia. Last, section E simulates a number of reform scenarios in the STRESS model.

B.   Dimensions and Measurement of Informality

9.   **Informality is a multi-dimensional phenomenon.** Broadly, we can think of informality as economic agents operating outside (part of) the framework of norms and regulations defined by the state. More specifically, informality is usually studied from the perspective of either the worker (labor informality), or the firm.[3] For both, being informal can either be a choice (e.g., a worker who prefers

---

[2] See Anand and Khera (2016), and Munkacsi and Saxegaard (2017).

[3] One can also think of spatial or land informality (CPC, 2017) but this will not be a focus of this chapter.

the flexibility of informal employment, or a firm which maximizes profits by avoiding taxes and regulations), or a forced outcome (e.g., a worker who would prefer employment which offers standard social security protection, but is unable to get such a job).[4]

10.   Labor formality can be measured with relative accuracy in Colombia, but there is no consensus on any one definition. Reliable measurements of informality from the worker's perspective can be obtained from household survey data going back to the 1990s. The most common conceptual approach is to think of informal employment as workers who do not contribute to social security. Alternative definitions are: workers who do not receive some or all mandated benefits, or workers who have a contract which does not pass some criterion of formality. As a proxy variable, a common definition of informality originally advocated by the International Labor Organization (ILO) is to use a size-based and occupational measure which defines informal workers as those who work in firms with less than 5 or 10 employees, or are self-employed, and have a low education level. Indeed, this is the official definition used by the statistical institute (DANE) in Colombia.[5] The Ministry of Labor and the Planning Office (DNP) both use the social security criterion.[6]

11.   Firm informality is significantly more difficult to measure. The dimension one would usually like to capture is whether a firm is officially registered with the relevant public bodies (e.g., tax authority). Given that both administrative data (such as tax authority databases), and most survey data (e.g., manufacturing firms surveys) only capture formal firms this is a hard exercise in practice.[7] The evidence available for Colombia is sporadic, and of limited geographic coverage.

---

[4] See Perry et al. (2007) for an extensive discussion of frameworks to think about informality.

[5] According to DANE's exact definition, informal workers: (i) work in firms with 5 or fewer employees; (ii) are business owners of firms with 5 or less employees; (iii) are unpaid family aids and housekeepers; or (iv) are self-employed, with an educational level less than University or Technical education. Note also that DANE's preferred definition of informality is a purely urban concept, measured either for the major 13 cities of the country and surrounding metropolitan areas or 23 cities with metropolitan areas. The firm size criterion was changed from 10 to 5 employees starting in 2010.

[6] Bernal (2009) calculates 23 potential informality measures for Colombia and concludes that "After analyzing all the available definitions, the author concludes that making Health and Pension benefits is the more suitable for the case of Colombia. Because it adheres more to the concept of informality, identifies vulnerable workers, is highly correlated with other measures of informality, is a good indicator that the individual has the entire package of benefits associated with formal employment." Also see Galvis (2012).

[7] Mexico is the only country in Latin America which regularly (every two years) collects data which allows following developments in firm informality in a reliable way.

12.   Labor informality fell by several percentage points over the past few years, and stands at 48−63 percent now.
Depending on the exact definition used, labor informality fell by 3.3 to 8.2 percentage points between 2007 and 2017. For the country as a whole, and using the social security criterion, informality stood at 63 percent as of Q3 2017, relative to 70 percent in 2007. Using the size criterion (which is a purely urban concept) informality dropped below 50 percent for the first time in early 2014.

Labor Informality Rate

Informality in 23 Main Urban Areas (Size Criterion)
Informality in 23 Main Urban Areas (Social Security Criterion)
Informality Total Country (Social Security Criterion)
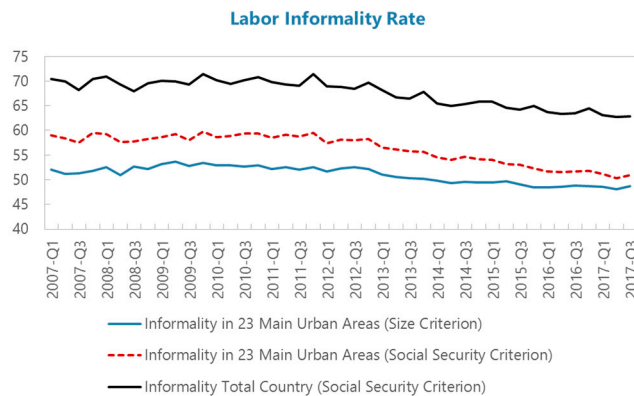
Source: DANE.

13.   Existing estimates suggest that firm informality lies between 45−65 percent (Haman and Mejia, 2011). Cardenas and Rozo (2009) and Santa Maria and Rozo (2009) use regional economic censuses to calculate firm informality rates and show that informal firms make up a large fraction of total firms. Santa Maria and Rozo (2009) also show that firm informality is very closely tied to firm size, with larger firms being significantly more likely to be formal.

Labor Informality and Formality
(DANE Criterion)

Informality (23 Cities)   Formality (23 Cities)
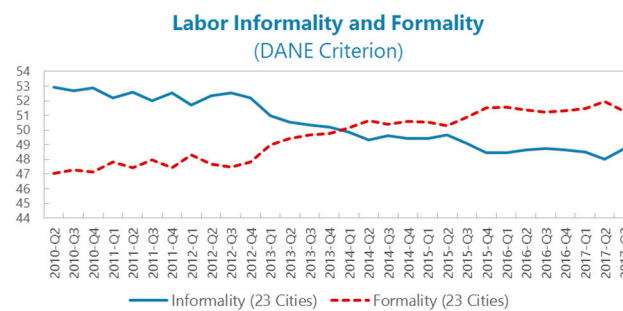
Source: DANE.

14.   In terms of GDP, estimates suggest that between 20−40 percent of output is produced by the informal sector. Using various methodologies to approximate an essentially unobserved variable, Medina and Schneider (2018) find that the informal sector accounts for 21−33 percent of GDP in Colombia in recent years. Anif 2017 report an even higher number, putting the shadow economy (informal sector 33.5 percent + illegal sector 6.3 percent) at around 40 percent of GDP.

15.   Given that informality can have significant economic costs, reducing it should be a policy priority. Among the most important macroeconomic costs, informality can have consequences for productivity given that informal firms tend to grow substantially less than formal firms, and thus do not have access to economies of scale to the same degree. Additionally, informality imposes a fiscal cost given that it reduces the tax base.

C.   Informality in Regional Perspective

16.   **Figure 1 highlights a number of stylized facts about informality in Latin America and Colombia.[8]**
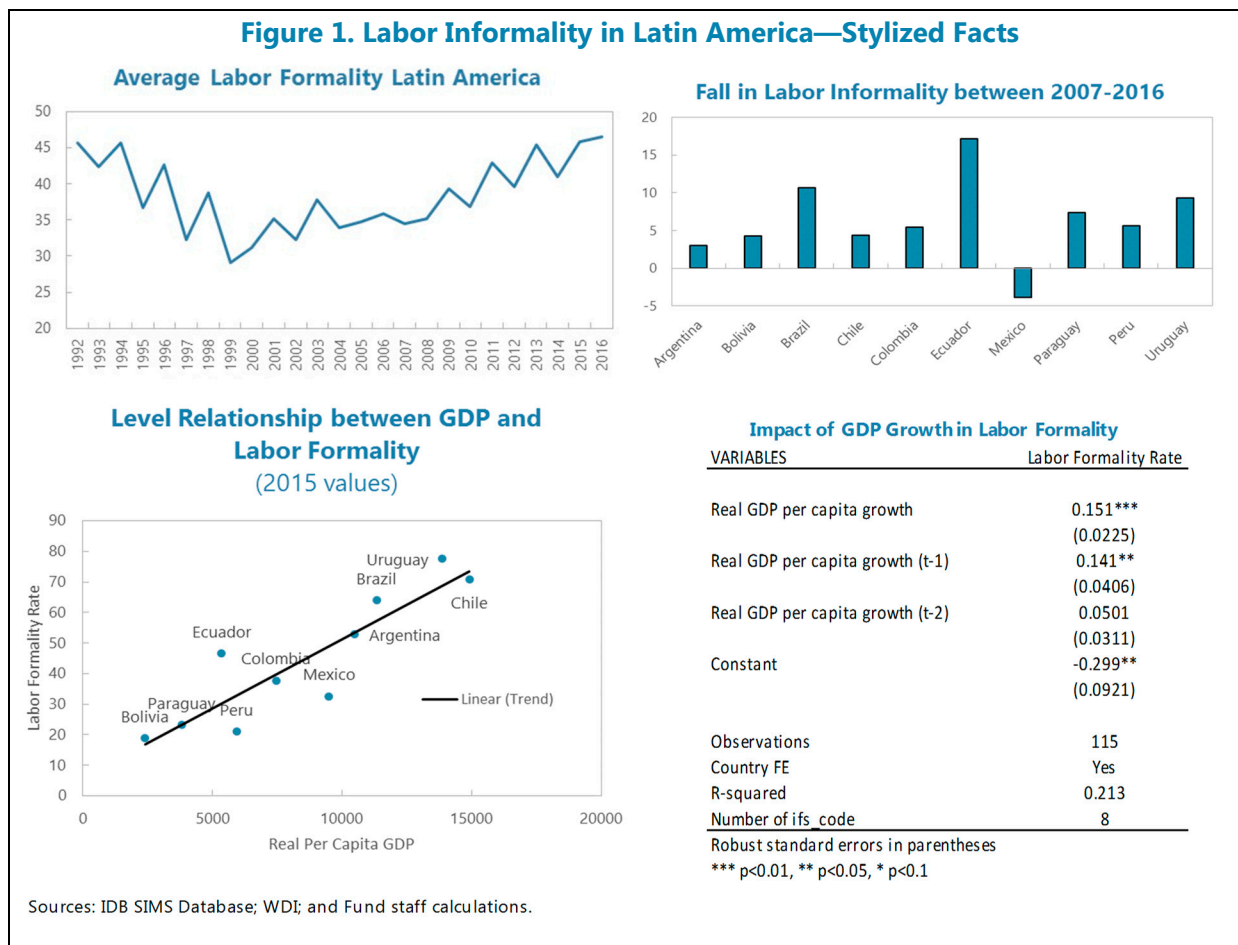
- **Labor informality is a highly persistent phenomenon.** Average labor formality has increased across the region over the last decade. In fact, in line with the strong GDP growth and favorable labor market dynamics experienced by the whole region, informality has fallen in most countries. But on aggregate this has only somewhat more than reversed losses in formality experienced during the 1990s.[9] The gains in labor formality achieved by Colombia over the past decade are marginally higher than the average gains across the region.

- **Labor informality decreases with the level of development.** In the cross-section, the correlation between the level of development as proxied by GDP per capita and labor formality is very strong. This observation also holds more broadly when looking at a worldwide sample of countries. Colombia's level of formality is broadly in line with the level predicted by its GDP per capita.

- **Labor informality is counter-cyclical.** Informality moves with the cycle, a point also made by Bosch and Maloney (2008), Bosch and Esteban-Pretel (2012), Loayza and Rigolini (2006) and Bernal (2009), among others, largely because formal-sector hiring falls more sharply than informal-sector hiring during downturns (Perry, 2007). In a simple fixed effects regression for Latin American countries we estimate that a one percentage point increase in real GDP per capita growth is associated with an increase in labor formality by 0.3 percentage points after 2 years.[10]

---

[8] Cross country labor formality data comes from the Inter-American Development Bank's (IDB) SIMS database (Labor Market and Social Security Information System). The definition of informality follows the IDB's official definition which uses pension contributions as the criterion for formality. Data are harmonized across countries and so is age coverage; the working age population is defined to be the population between ages 15–64.

[9] Since data is not available for all countries in all years the composition of countries underlying the yearly average varies somewhat, introducing volatility into the series.

[10] Mondragon-Velez et al. (2010) argue that in the case of Colombia the business cycle is of second-order importance and labor market rigidities are the key factor for informality.

Figure 1. Labor Informality in Latin America—Stylized Facts

Average Labor Formality Latin America

Fall in Labor Informality between 2007-2016

Level Relationship between GDP and Labor Formality
(2015 values)

Impact of GDP Growth in Labor Formality

VARIABLES	Labor Formality Rate
Real GDP per capita growth	0.151***
	(0.0225)
Real GDP per capita growth (t-1)	0.141**
	(0.0406)
Real GDP per capita growth (t-2)	0.0501
	(0.0311)
Constant	-0.299**
	(0.0921)
Observations	115
Country FE	Yes
R-squared	0.213
Number of ifs_code	8

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Sources: IDB SIMS Database; WDI; and Fund staff calculations.

17.   Firm informality in Colombia is high in a regional comparison. According to the latest World Bank Enterprise Survey for Colombia (which dates from 2010), 70.9 percent of firms report competing against informal firms and 55 percent identify practices of competitors in the informal sector as major constraints, highlighting the large challenge posed by firm informality. Both these numbers are substantially above the average for Latin America.

Percent of firms competing against unregistered or informal firms
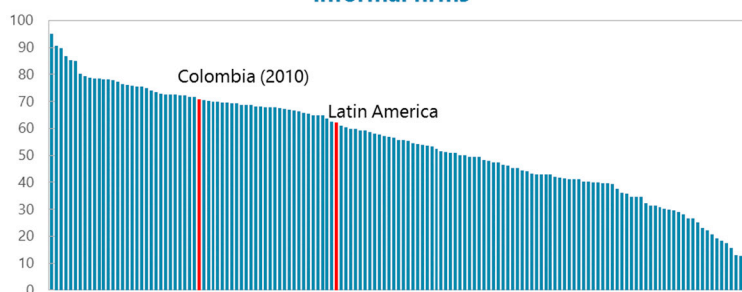
Source: World Bank.

18.   Labor informality in Colombia is driven, to a large extent, by informal self-employment. To try to understand what aspects of informality make up the headline number for Colombia we split out formality among salaried workers and self-employed ones. While Colombia does relatively well in terms of labor formality among salaried workers, it does poorly among the self-employed—according to IDB SIMS data, in 2016 67.3 percent of all

Self-Employment in Latin America

Percentage of workers who are self-employed

Source: IDB SIMS.

salaried workers but only 12.7 percent of independent workers were formal. Additionally, the rate of self-employment is very high in Colombia. This is of particular concern since Perry et al. (2007) show that a large share of Colombian self-employed workers seems to be excluded from the formal labor market—in a number of Latin American countries self-employed workers report choosing to be self-employed when asked in a survey, but in Colombia many of the self-employed would prefer a salaried employment, and cannot find one.
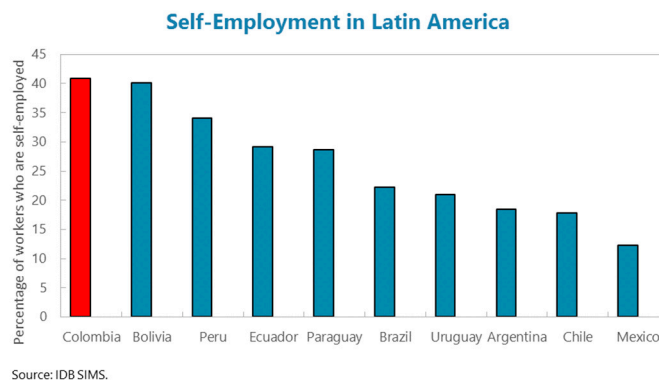
19.   Education and skills are crucial to understand informality. In all countries in the region, the probability of being informal decreases dramatically with the level of education of a worker. In Colombia, a worker with a postgraduate degree is nine times as likely to be formal than a worker without any education, and twice as likely as a worker with a high school degree, but no tertiary education. While higher income reduces informality via a demand effect, La Porta and Shleifer (2014) argue that the supply channel (a lack of human capital, and

Formality Rate by Education Level

Source: Gran Encuesta Integrada de Hogares.

specifically a lack of educated entrepreneurs) might be the most important factor for informality.
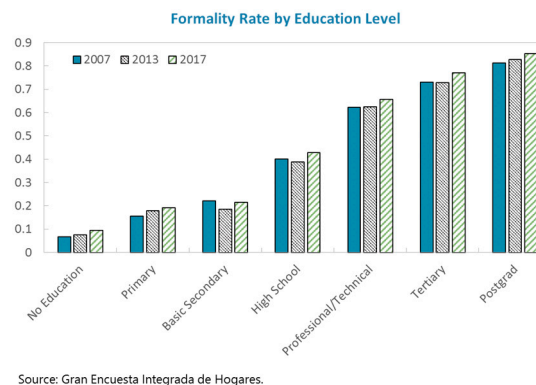
20.   Additionally, policy choices related to taxes and regulations can contribute significantly to informality. A broad range of labor market, product market or other factors can create a wedge between the cost of operating in the formal and informal sectors, making it more beneficial for certain firms and workers to remain informal if the costs outweigh the benefits associated with the formal sector (access to finance, larger markets, social security benefits, etc.). Reforms should thus aim to reduce the relative costs of formality.[11]

21.   Colombia implemented several structural reforms over the past years which are having a positive impact. The government enacted three major reforms over the past decade which

---

[11] See Perry et al (2007), Dabla-Norris and Inchauste (2007), OECD/CIAT/IDB (2016) and Ulyssea (forthcoming) among a large literature on policy choices and informality outcomes.
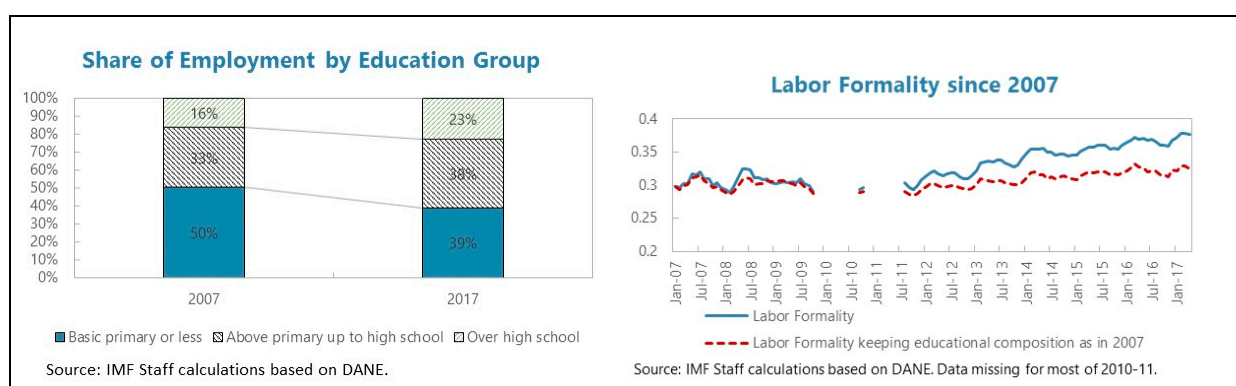
attempt to tackle some of the structural constraints. The 2006 Entrepreneurship Law was followed by the Formalization and Job Creation Law of 2010 which introduced a package of measures aimed at reducing the fixed cost of being in the formal sector (simplified bureaucratic procedures), reducing payroll taxes and social security contributions for small firms and providing better labor market support.[12] The tax reform of 2012 significantly cut the labor tax wedge, reducing mandatory contributions from 29.5 percent to 16 percent of gross wage earnings for workers earning less than 10 minimum wages.[13] Kugler et al. (2017) show that the 2012 tax reform reduced informality, especially for workers in smaller firms, and those close to the minimum wage.[14]

22.   Nevertheless, several structural impediments remain in Colombia. Besides skill mismatches and human capital constraints, complex bureaucratic steps and firm entry costs, a minimum wage which is highly binding in certain areas, and relatively high non-wage labor costs, even after the 2012 reform, stand out as potential factors. In the following section we look at these constraints in more detail.

D.   Causes of Informality in Colombia

Education/Skill Mismatches

23.   Two separate exercises show the paramount role improving human capital has for lowering informality in Colombia. First, staff decomposed the fall in labor informality over the last decade into the change in informality within education groups and the change in the size of different education groups and found that the latter dominates. Second, staff empirically assessed the factors which explain cross-sectional variation in labor informality between Colombian regions, and found that an index of the quality and quantity of post-secondary education has the highest explanatory power.

Share of Employment by Education Group

Source: IMF Staff calculations based on DANE.

Labor Formality since 2007

Source: IMF Staff calculations based on DANE. Data missing for most of 2010-11.

---

[12] Specifically, the support programs included micro-credit programs for individuals under 28 years old, technical training programs, and financial support programs.

[13] The reform aimed to be revenue neutral by adjusting the VAT system and making personal income taxes more progressive.

[14] Morales and Medina (2016) also find a positive impact of the reform on formal-sector job creation.

24.   Two thirds of the fall in informality between 2007 and 2017 are due to a better educated workforce. Between 2007 and 2017 the formality rate for workers with no more than primary education increased from 12 to 15 percent, for those with some type of secondary education it rose from 37 percent to 40 percent, and for those with tertiary education it rose from 71 to 73 percent, all increases of roughly 3 percentage points. And yet the total formality rate rose by nearly 8 percentage points. The reason is that the share of workers with only primary education or less dropped from half to less than 40 percent, while the share of workers with higher education increased by 7 percentage points to 23 percent.

25.   At the subnational level, access to and quality of higher education is highly associated with labor formality. There exists large regional variation in informality in Colombia which can be exploited to gauge the determinants. Simple cross-sectional regressions suggest that education, and, in particular, access to and quality of higher education (which includes technical professional, technological and university education) has by far the largest explanatory power, outweighing even GDP per capita.[15] The higher education index explains 44–49 percent of the cross-sectional variation which compares to 1–5

VARIABLES	(1) Labor Informality Rate	(2) Labor Informality Rate	(3) Labor Informality Rate
GDP per Capita	-4.83e-07*	-4.56e-07*	-3.86e-08
	(2.48e-07)	(2.37e-07)	(2.22e-07)
World Bank Regional Doing Business Score		-0.824	-0.467
		(0.761)	(0.546)
Higher Education Index			-0.693***
			(0.166)
Constant	61.97***	117.8**	103.2***
	(3.530)	(50.23)	(35.81)
Observations	23	23	23
R-squared	0.202	0.269	0.495

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

percent of the variation which is explained by regional differences in the World Bank Doing Business index.

26.   Several promising policy initiatives aim to improve education outcomes and reduce skill mismatches in Colombia. These include programs to allow low-income students to access high-quality tertiary education as well as expanding the supply of education. The authorities are also working on a long-term strategy to reduce skills mismatches by developing a national framework (marco nacional de

Skills Mismatches

Source: Lora (2015)

■ Supply   ▨ Demand (Vacancies)

cualificaciones) which aims to ensure that the growing number of higher education degrees are pertinent to the needs of the country. Further strengthening the coverage and quality of education

---
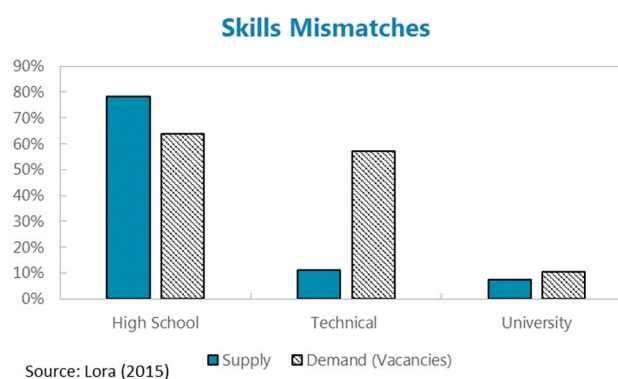
[15] The higher education index ('Indice de Progreso de la Educacion Superior (IPES)) is compiled annually by the Ministry of Education and based on a methodology developed for Mexico by the education institute in Monterrey. It combines information on the share of 17–21-year-old enrolled in higher education, the share of students with high scores in standardized exams and the share of students who graduate from their course within 14 semesters.

by building on the expansion of higher education coverage from 37 percent in 2010 to 52 percent in 2017 will remain important.

Taxes and Regulation

27.   The administrative burden for the formal sector is high. Colombia scored 123th out of 137 countries in the latest World Economic Forum burden of government regulation index, indicating that complex bureaucratic steps are a significant barrier for formal firms. Part of the complexity arises due to the regional variation in regulations and complicated procedures for paying departmental and local taxes (see OECD, 2016; World Bank, 2017). To improve processes, the government is putting in place the *ventanilla unica empresarial* which will streamline and bundle necessary steps. Regional governments could also usefully harmonize practices to some degree, in line with the best performing regions.

Burden of Government Regulations
(2017–18 Report)
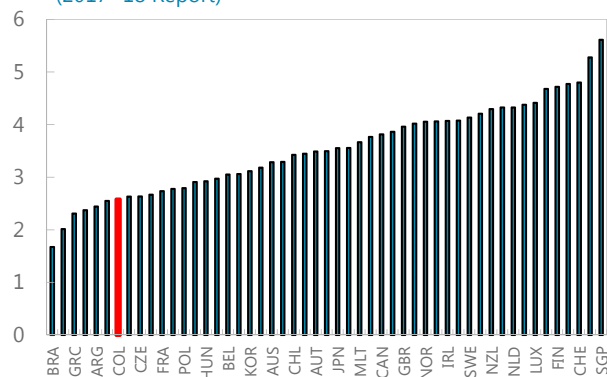
Source: World Economic Forum.

28.   Firm entry costs are substantial, especially for small and micro firms. Firms are required to register with the Chambers of Commerce through the *registro mercantil*, and renew this registration annually by paying a fee. The costs of doing so are higher than in peer countries and the current system is particularly costly for smaller firms and disincentives formality (Salazar et al., 2017; CPC, 2017). Different and less regressive contribution systems could be considered in line with some of the suggestions made by Salazar et al (2017) while preserving the positive role the registro plays for the economy.[16]

29.   For small and micro firms, the tax burden can be a key impediment to formalization. Gomez and Steiner (2015) calculate effective tax rates for firms of different sizes in Colombia. They find that on average the total effective tax rate is around 50 percent of profits and for small firms it can be as high as 100 percent, leading to very significant costs of formalization from the perspective of the firms.

---

[16] See also Cardenas and Rozo, (2009) who suggest easing access to the *registro mercantil,* and expanding training programs for owners to reduce firm informality.

30.   Minimum wages are highly binding in regions where labor productivity is lower. According to OECD data, at close to 90 percent of the median wage in 2015, Colombia had the highest ratio of minimum wage to median wage of full-time employees in the OECD sample and the wage distribution is compressed just above the minimum wage. [17] It is particularly binding in regions with

Minimum to Median Wage

Source: OECD.

lower labor productivity, with negative impacts on the labor market outcomes in those regions (Arango and Florez, 2017). Reform suggestions include making the minimum wage vary by groups of regions (Arango and Florez, 2017).
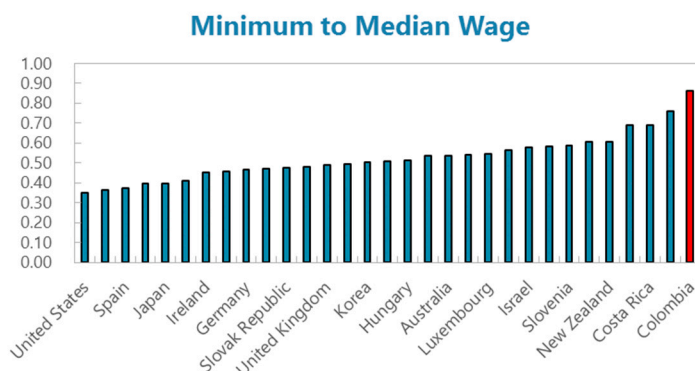
31.   Non-wage labor costs remain relatively high, even after the 2012 reform. According to detailed calculations by Anif (2015), total non-wage labor costs, including pensions, health, holidays, *parafiscales*, and others, add up to 39-52 percent of the wage of a worker. While many of these costs have direct benefits for the worker, and are a desirable element of a formal work relationship, 4 percentage points of the 16 percentage points payroll tax are used to pay for so called *Cajas de Compensacion Familiar* which provide a wide range of bundled benefits. Recent reform suggestions propose finding alternative sources of financing for the funds to further lower payroll taxes in the spirit of the 2012 tax reform (CPC, 2017).[18]

Other Factors

32.   Distortions related to social security programs might be incentivizing informality. Among other distortions, a part of formal workers' health care contributions is used to finance the subsidized system, and thus acts as a tax. Moreover, the subsidized system offers nearly the same services as the contributory one. A clearer link between contributions and benefits could make formality more attractive.

33.   Stronger enforcement would help protect vulnerable groups of workers and increase the costs of informality. Enforcement has been a concern in the past, but the authorities have taken steps to increase available resources (OECD, 2016). The Ministry of Labor is working on streamlining IT systems and interactions with other agencies to guarantee improved enforcement of labor laws.

---

[17] Trade union density is very low in Colombia as is the coverage of collective bargaining. The minimum wage negotiations thus gain an outsized importance by being one of the few instances in which worker bargaining power is high. Any minimum wage reform would thus have to be accompanied by adequate offsets.

[18] Cuesta and Olivera (2014) caution against how big an impact a reform of the parafiscales would have given the multiple distortions in the labor markert.

34.   Trust in public institutions is ultimately very important to formalize the economy in a permanent way. This requires communicating the benefits of formality (and thus the benefits of interacting with the state) to all economic agents, and delivering public services of high quality. The Ministry of Labor is reaching out to rural areas through the '*Red Nacional de Formalizacion Laboral*' to inform workers and small business owners about social security systems. Additionally, in 2017 formalization fairs were started to move beyond pure communication, allowing workers and small business owners to take immediate steps towards formalization.

E. Modeling Reform Options: The STRESS Model

35.   Staff simulated the impact of some of the reforms discussed above. Staff calibrated a small open-economy dynamic general equilibrium model, with unemployment due to hiring costs and wage bargaining, and endogenous firm entry, developed by Anand and Khera (2016) and Munkacsi and Saxegaard (2017).[19] The incorporates a distinction between formal and informal sectors in the labor and goods markets when exploring the macroeconomic impact of structural reforms.[20] Firms in the formal sector face higher entry costs and hiring costs than in the informal sector, they pay taxes and workers in the formal sector have higher bargaining power than those in the informal sector. But formal sector firms have access to a larger market, since informal firms are not able to export or provide goods to the government.

36.   The steady state of the model calibrated to Colombia highlights the differences between the two sectors. TFP and the capital share in the Cobb-Douglas production function are exogenously fixed and assumed to be the same in both sectors. Nevertheless, in steady state the endogenous values for output, the capital stock and labor productivity are higher in the formal sector as a consequence of the incentives and constraints embedded in the model as set out in the following. The formal sector retailers'[21] exit rate is calculated based on exit rates from the '*registro unico empresarial y social*' for 2013-16, and the informal retailers exit rate is exogenously assumed to be higher, in line with empirical evidence (Ulyssea, *forthcoming* for Brazil). The exogenous firing probability is higher in the informal sector, with the parameter value for the formal sector calculated based on labor flow data. Last, taxes in the informal sector are zero, while payroll taxes are 16 percent in the formal sector to match Colombia's statutory rate, and the effective rate of employee taxes is calibrated based on the observed ratio of personal income tax to GDP. Retailer entry costs in the formal sector are calibrated based on data on entry costs relative to output taken from the World Bank Doing Business report. Last, bargaining power in the formal sector is exogenously set higher than in the informal sector to match the long-run value of unemployment.

---

[19] The original applications of the so-called STRESS (Structural Reforms and Shadow Sector) model were to India and South Africa. It was subsequently applied to Argentina (2017 Argentina SIP) and Peru (2017 Peru staff report), with the version used in this chapter following the one for Peru.

[20] See Suescun and Steiner (2017) for a literature review of Colombian macro models, a number of which distinguish between the formal and informal sector and include a minimum wage which is binding in the formal sector, generating unemployment in equilibrium.

[21] Retailers sell differentiated varieties of the intermediate goods produced by wholesale goods producers.

Formal vs. Informal Sector in Steady State		
	Formal Sector	Informal Sector
Output	3.8	1.5
TFP	1	1
Capital Share	0.34	0.34
Capital Stock	24.99	12.04
Employment	0.32	0.55
Capital per employee	78.09	21.89
Labor productivity	11.88	2.73
Retailers Exit Rate	0.125	0.35
Probability of Hiring	0.05	0.7
Probability of Firing	0.09	0.7
Tax rate on employees	0.04	0
Tax rate on employers	0.16	0
Worker bargaining power	0.78	0.2
Retailer Entry Costs	2.89	0.06

37.   The calibrated model matches the long-term properties of the observed data for Colombia well. The calibration aims to match the average of quarterly data for a set of macroeconomic and labor market variables over the period 2000-2016. As the below table shows, the model does well in this respect.

Model Steady State vs Observed Values		
Variable Description	Model	Data
Private Investment as share of GDP	0.24	0.23
Openness as share of GDP	0.40	0.39
Unemployment rate	13.30	13.12
		0.21 to
Shadow economy as share of GDP	0.30	0.4
Informal employment as share of total employment	0.63	0.66
Ratio of formal to informal sector wages	2.87	2.78

38.   Simulation results suggest that labor market reforms, as well as cutting firm entry costs, could indeed lead to lower informality in the long-run. Results show that permanently cutting entry costs in the formal sector, or labor reforms such as lower formal-sector worker bargaining power and reducing payroll taxes leads to a steady state with lower informality driven by higher formal sector employment. Previous related work (Munkacsi and Saxegaard, 2017) suggests that combining reforms in a package and sequencing labor market reforms prior to product market reforms is often favorable.

Steady-State Impact of Reforms		
	Labor Informality (percentage points change)	Formal Employment (percentage points change)
Reduction in Firm Entry Costs by 10 percent	-0.2	0.4
Reducation in Payroll tax from 16 to 14 percentage points	-0.3	0.1
Reducation in Formal/Informal Worker Bargaining Power Wedge by 10 percent	-1.2	3.5

Annex I. A Sketch of the STRESS Model

1. **STRESS (Structural Reforms and Shadow Sector) is a small open-economy dynamic general equilibrium model with unemployment due to hiring costs and wage bargaining following Blanchard and Gali (2010), and endogenous firm entry like Bilbie et al. (2012).** The main novelty is the distinction between formal and informal sectors in the labor and goods markets. On the one hand, it means tax evasion in the underground economy, on the other hand, in line with Williamson (1975), the level of regulation is lower in the informal sector. Also, openness is only a consideration in the formal sector.

2. **The household sector is standard; there is a representative infinitively living household that maximizes the expected discounted lifetime utility of consumption.** However, consumption is an aggregate of home and foreign produced goods, while home produced goods are an aggregate of goods produced in the formal and informal sectors. Then, as regards the budget constraint, labor income originates from both the official and unofficial economies; while the former is taxed. Also, the household owns all the firms, and so finances new firms' entry cost, in both sectors, which is equal to the expected discounted future profit-stream of firms.

3. **Both formal and informal wholesale good producers produce an intermediate good by a Cobb-Douglas production function.** Both pay not only the cost of labor and capital as usual, but additionally a hiring cost of newly hired workers, while labor follows a law of motion similarly to that of capital. Next, as regards retailers, due to endogenous entry, their number is not normalized to one, but is related to the law of motion of the number of firms. Additionally, the number of firms, in both the official and unofficial sectors, endogenously affect price markups.

4. **Rigidities related to hiring, bargaining and entry are lower in the shadow sector.** On the one hand, formal-sector firms incur greater hiring costs than do firms in the informal sector. These costs can be associated with training to make up for educational or experiential deficits on the worker's part, but they might reflect as well administrative costs such as the time spent on hiring. Then too, the bargaining power of workers in wage setting is higher in the formal than in the informal sector. The strength of unions in the formal sector might be at play here, but this relative bargaining clout can also be related to the sector's legal environment, which provides more rights for workers than firms in setting wages. Employment protection might also be reflected in the fact that the probability of firing is relatively lower in the formal sector. Furthermore, registering a new company is costly, in terms of both money and time; formal entry costs are larger than informal ones. Finally, price mark-up is higher and firm exit rate, similarly to the dismissal rate of workers, is lower in the formal sector than in the underground economy.

5. **Alongside differences in regulation levels, other features serve to distinguish the two sectors. Notably, only formal sector's labor income falls under the taxation umbrella.** Also, by virtue of administrative regulations in the formal sector and lack of financing in the informal sector, the government can only purchase formal goods and investment is also a function of formal goods only. As well, labor productivity in the informal sector is lower than in the formal sector. Finally, formal goods are traded abroad, but informal goods are not, which is likely to be explained by the fact that entering the foreign markets requires meeting certain legal obligations. The fact that only formal goods are traded abroad constitutes the main example in our model of interactions between the shadow economy and openness.

References

Anand, Rahul and Purva Khera, 2016, "Macroeconomic Impact of Product and Labor Market Reforms on Informality and Unemployment in India," IMF Working Paper No. 16/47 (Washington: International Monetary Fund.

Anif, 2015, "Costos no salariales en Colombia pos-Ley 1607 de 2012."

Anif, 2017, "Reducción del efectivo y tamaño de la economía subterránea en Colombia."

Arango, Luis E. and Luz A. Florez, 2017, "Informalidad laboral y elementos para un salario mínimo diferencial por regiones en Colombia," Banco de la Republica, Borradores de Economía, No. 1023.

Bernal, Raquel S., 2009, "The Informal Labor Market in Colombia: Identification and Characterization," *Desarrollo y Sociedad*, Vol. 63.

Bilbie, Florin O., Fabio Ghironi and Marc J. Melitz, 2012, "Endogenous Entry, Product Variety, and Business Cycles," *Journal of Political Economy*, Vol. 120, No. 2.

Blanchard, Olivier and Jordi Gali, 2010, "Labor Markets and Monetary Policy: A New Keynesian Model with Unemployment," *American Economic Journal: Macroeconomics*, Vol.2, No. 2.

Bosch, Mariano and William Maloney, 2008, "Cyclical Movements in Unemployment and Informality in Developing Countries," IZA Discussion Paper Series, IZA DP No. 3514.

Bosch, Mariano and J. Esteban-Pretel, 2012, "Job Creation and Job Destruction in the Presence of Informal Markets," *Journal of Development Economics*, Vol. 98.

Cardenas, Mauricio and Sandra Rozo, 2009, "Informalidad empresarial en Colombia: problemas y soluciones," *Desarrollo y Sociedad*, Núm. 63.

Consejo Privado de Competitividad, 2017, "Informalidad: una nueva vision para Colombia."

Cuesta, Jose and Mauricio Olivera, 2014, "The Impact of Social Security Reform on the Labor Market: The Case of Colombia," *Journal of Policy Modeling*, Vol. 36.

Dabla-Norris, Era and Gabriela Inchauste, 2007, "Informality and Regulations: What Drives Firm Growth?", IMF Working Paper No. 07/112 (Washington: International Monetary Fund).

Departamento Nacional de Planeacion, 2016, "[Evaluacion del programa ser pilo paga] Informe de resultado del levantamiento de linea de base, evaluacio de impact de corto plazo y tercera entrega de la documentacion de las bases de datos."

Galvis, Luis Armando, 2012, "Informalidad laboral en las áreas urbanas de Colombia," Banco de la Republica, Documentos de trabajo sobre economía regional, No. 164.

Gómez, Hernando Jose, and Roberto Steiner, 2015, "La Reforma Tributaria y su impacto sobre la Tasa Efectiva de Tributación de las firmas en Colombia," *Coyuntura Economica: Investigacion Economica y Social,* Vol. XLV.

Haman, Franz and Luis-Fernando Mejia, 2011, "Formalizando la informalidad empresarial en Colombia," Banco de la Republica, Borradores de Economía, No. 676.

International Monetary Fund, 2017, "Argentina: Selected Issues" (Washington).

International Monetary Fund, 2017, "Peru: 2017 Article IV Consultation Staff Report" (Washington).

Kugler, Adriana D., Maurice D. Kugler and Luis O. Herrera-Prada., 2017, "Do Payroll Tax Breaks Stimulate Formality? Evidence from Colombia's Reform," *Economia*, Vol. 18, No. 1.

La Porta, Rafael and Andrei Shleifer, 2014, "Informality and Development," *Journal of Economic Perspectives*, Vol. 28, No. 3.

Medina, Leandro and Friedrich Schneider, 2018, "Shadow Economies Around the World: What Did We Learn Over the Last 20 Years?", IMF Working Paper No. 18/17 (Washington: International Monetary Fund).

Loayza, Norman V. and Jamele Rigolini, 2006, "Informality Trends and Cycles," World Bank Policy Research Working Paper, WPS4078 (Washington: World Bank).

Morales, Leonardo Fabio and Carlos Medina, 2016, "Assessing the Effect of Payroll Taxes on Formal Employment: The Case of the 2012 Tax Reform in Colombia," Banco de la Republica, Borradores de Economia, No. 971.

Mondragon-Velez, Camilo, Ximena Pena and Daniel Wills, 2010, "Labor Market Rigidities and Informality in Colombia," *Economia*, Vol. 11, No. 1.

Perry, Guillermo, William Maloney, Omar Arias et al., 2007, "Informality: Exit and Exclusion," International Bank for Reconstruction and Development/The World Bank, Washington.

Munkacsi, Zsuzsa and Magnus Saxegaard, 2017, "Structural Reform Packages, Sequencing, and the Informal Economy," IMF Working Paper No. 17/125 (Washington: International Monetary Fund).

OECD, 2016, "OECD Reviews of Labour Market and Social Policies: Colombia 2016," OECD Publishing, Paris.

OECD/CIAT/IDB, 2016, "Taxing Wages in Latin America and the Caribbean," OECD Publishing, Paris.

Santa Maria, Mauricio and Sandra Rozo, 2009, "Análisis cualitativo y cuantitativo de la informalidad empresarial en Colombia," *Desarrollo y Sociedad*, No. 63.

Salazar, Natalia, Carlos A. Mesa and Natalia Navarrete, 2017, "La estructura de las tarifas de registro en las cámaras de comercio y beneficios de sus servicios: impacto sobre la competitividad y la formalidad empresarial", Bogotá: Fedesarrollo.

Suescún, Rodrigo and Roberto Steiner, 2017, "Un modelo de equilibrio general dinámico para la evaluación de la política económica en Colombia," Fedesarrollo.

Ulyssea, Gabriel, "Firms, Informality, and Development: Theory and Evidence from Brazil," *American Economic Review* (forthcoming).

Williamson, Oliver E., 1975, "Markets and Hierarchies, Analysis and Antitrust Implications: A Study in the Economics of Internal Organization," The Free Press, December.

World Bank, 2017, "Doing Business in Colombia 2017" (Washington).

COLOMBIA'S FISCAL RESPONSE TO THE OIL SHOCK AND THE ROAD AHEAD[1]

Colombia's strong fiscal framework has been central to Colombia's remarkable adjustment to the large 2014–15 oil price shock. The authorities' response so far has combined revenue mobilization, some widening of the fiscal deficit and expenditure restraint. The authorities' medium-term fiscal framework calls for additional expenditure cuts; yet the fiscal rule could offer space to shift some of the near-term cuts to later years in support of the economic recovery.

A. Fiscal Rule and Scenarios for Near-Term Adjustment

Background

1.   **The introduction of the fiscal rule in 2011 further strengthened Colombia's fiscal framework and has contributed to protect debt sustainability.** The fiscal responsibility law of 2003 provides a *qualitative* anchor to fiscal policy including the publication of an annual medium-term fiscal framework compatible with debt sustainability for the broad public sector (NFPS). The fiscal rule law of 2011, added a *quantitative* anchor to the central government and, by focusing on a structural balance target (adjusted by GDP and oil prices), includes some degree of policy countercyclicality.

Fiscal Adjustment Since 2014

2.   **Colombia's response to the 2014–15 large oil price shock has been guided by the fiscal rule and has combined revenue measures, expenditure restraint and some widening of the headline deficit**. See table below.

- From 2013 to 2017, the fiscal cost of declining oil revenue (3.1 percent of GDP) was also compounded by an increasing interest rate bill due in part to the ensuing peso depreciation (0.6 percent of GDP) for a combined shock of 3.7 percent of GDP.

- The direct application of the structural balance formula (chart below), allowed the deficit to widened by about 1.7 percent of GDP between 2013–16; by the same logic, the rule already called for some narrowing of the deficit in 2017, so that the 2013–17 net impact is about a widening of 1.3 percent of GDP or about 35 percent of the oil revenue+interest bill combined shock.

- The combination of two tax reforms (2014, and 2016), as well as some tax administration gains provided about 1.3 percent of GDP of non-oil revenue, absorbing too about 35 percent of the shock.

---

[1] Prepared by Daniel Rodríguez-Delgado.

- Despite such revenue measures, primary expenditure cuts of about 0.5 percent of GDP were required. Of which, capital expenditure was cut by 0.8 percent of GDP. Reliance on capital expenditure cuts reflect in part the limited expenditure flexibility in Colombia.

- It is relevant to note that the 2017 outturn benefited from 0.5 percent of GDP one-off telecom fine.

Recent Fiscal Adjustment and the Adjustment Ahead												
	Response to the Oil Shock *(pp of GDP vs 2013)*					Medium-Term Adjustment *(pp of GDP vs 2017)*						
	2014	2015	2016	2017		2018	2019	2020	2021	2022	2023	
Shock	-0.7	-2.5	-3.8	-3.7	**Dividend**	0.4	0.7	0.8	0.9	1.0	1.2	
Oil revenue	-0.7	-2.2	-3.1	-3.1	Oil revenue	0.4	0.7	0.7	0.8	0.8	0.8	
Interest expenses	-0.1	0.3	0.7	0.6	Interest expenses	0.0	0.0	-0.1	-0.1	-0.2	-0.4	
Adjustment	0.7	2.5	3.8	3.7	**Adjustment**	-0.4	-0.7	-0.8	-0.9	-1.0	-1.2	
Non-oil revenue	0.5	1.5	1.4	1.9	Non-oil revenue	-0.8	-0.9	-0.3	-0.2	-0.2	-0.3	
Primary expenditure	-0.1	-0.3	-0.7	-0.5	Primary expenditure	-0.9	-1.6	-1.5	-1.6	-1.7	-1.7	
o/w fixed capital formation	-0.2	-0.5	-1.2	-0.9	o/w fixed capital formation	-0.4	-1.1	-1.0	-1.0	-1.2	-1.1	
Headline balance	-0.1	-0.7	-1.7	-1.3	Headline balance	0.5	1.4	2.0	2.3	2.5	2.5	
Memo items:					**Memo items:**							
Revenue measures	0.5	1.0	1.0	1.8	**Revenue measures**	-0.4	-0.8	-0.3	-0.3	-0.2	-0.2	
2016 tax reform 1/				0.3	CREE expiration		-0.9	-0.9	-0.9	-0.9	-0.9	
One-off telecom fine				0.5	One-off telecom fine	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	
2014 tax reform		0.5	0.5	0.5	Tax administration	0.1	0.6	1.2	1.2	1.2	1.2	
Tax administration	0.5	0.5	0.5	0.5								
Source: National authorities and Fund staff estimates												
1/ Official estimate 0.7 percent of GDP; 0.4 pp revision in line with outturn												

Baseline Adjustment Outlook

3. The authorities' medium-term fiscal consolidation path aims to gradually reduce the structural deficit. The structural deficit would decline gradually from 1.9 percent of GDP in 2017 to 1 percent of GDP by 2022. The headline deficit will have to decline by 2.5pp of GDP by 2022. In particular:

- In a partial reversal of the 2014–17 shock, one half (1.2 pp of GDP) of this narrowing of the headline deficit will come from higher oil revenues and lower

Central Government: Medium-Term Fiscal Adjustment
(in percent of GDP)

Sources: National authorities and Fund staff estimates

interest expenses. The increase in oil revenue builds on the better-than-expected Ecopetrol's profitability in 2017.
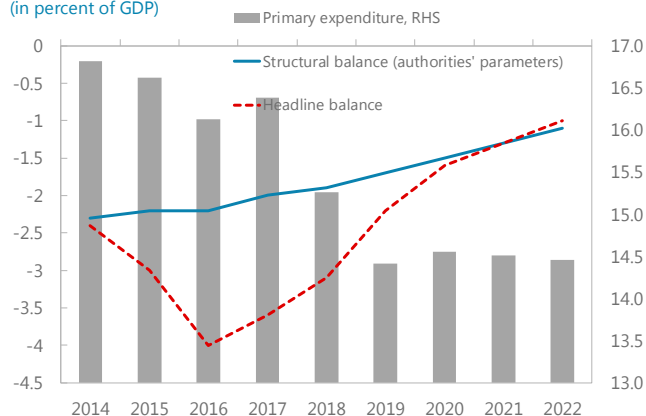
- Non-oil tax revenue will decline over the medium-term as the expected gains in tax administration and formalization from the 2016 tax reform, are more than offset by the combined impact of the expiration of the corporate surcharge CREE and the one-off proceeds from the telecom fine in 2017.

- In consequence, primary expenditure cuts of about 1.7 percent of GDP will be required by 2022. Lower transfer expenses (some of them linked to the expected benign outlook for inflation and GDP growth), will limit but not exempt further cuts in fixed capital formation which will amount to 1.1 percent of GDP.

4. **Under the current medium-term fiscal framework path, public debt to GDP ratio will steadily decline over the medium and long-term below the emerging market average**. Gross public debt will decline by about 9 pp of GDP between 2018 and 2023 to about 40 percent of GDP a level 15 pp below the emerging market average (55 percent of GDP).

5. **The authorities medium-term fiscal plan will entail a front loading of the fiscal adjustment with most of the negative fiscal impulse taking place by 2020 and hence coincide with a negative output gap**. Measured by the change in the non-oil primary structural deficit, the negative fiscal impulse stemming from the Central Government will amount to 0.5 percent of GDP in each 2019 and 2020. In combination with the rest of the CPS, this will imply a negative impulse of about 0.4 and 0.9 percent of GDP, respectively. In contrast, for 2021 and 2022 the fiscal stance will imply a small positive impulse (0.1 percent of GPD) at the CPS level. Colombia's output gap is expected to only gradually close and will average about 1.3 percent of potential GDP during 2018−20.

6. **The near-term adjustment will substract from growth, in particular through lower investment.** Amid limited budget flexbility most of near-term expenditure restraint will take place through lower investment. Public investment at the CPS level will decline by about 1 percent of GDP between 2017 and 2020. Recent estimations suggest a fiscal multiplier of capital expenditure in Colombia between 0.15 and 0.46 (e.g. Rincon, et al., 2014). Hence, the expect decline in investment could subtract about 0.3 percentage points of GDP growth.

Composition of Public Sector Fiscal Impulse
(in percent of GDP; impulse measured as the change in the non-oil structural primary deficit)
Sources: National authorities and Fund staff estimates and projections

CPS and CG Investment
(in percent of GDP)
Source: National authorities and Fund staff estimates and Projections
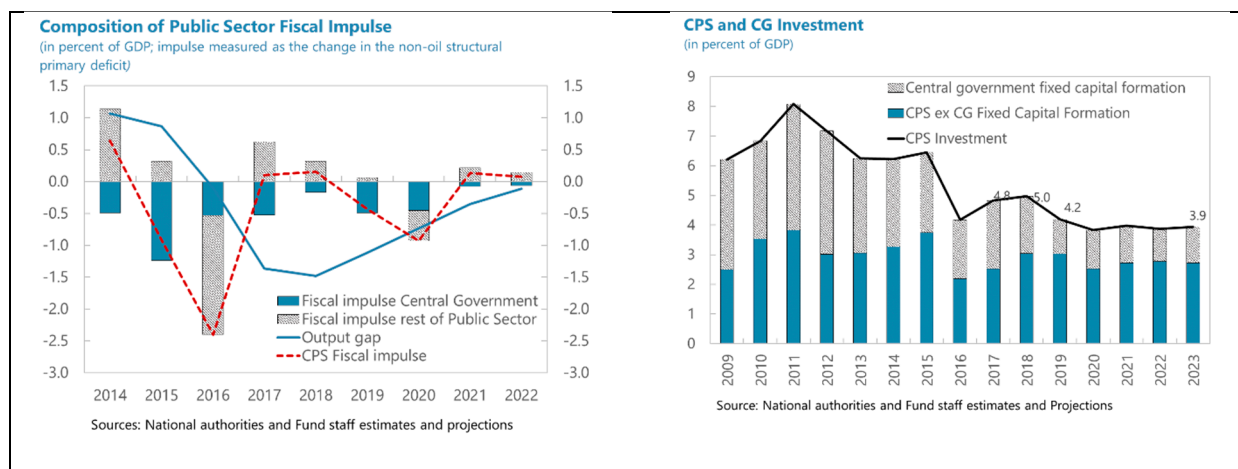
Alternative Fiscal Adjustment: Shifting Some of the Consolidation to 2021/2022

7.   A scenario in which reductions in the structural deficit were shifted to 2021 and 2022 will better time the fiscal restraint with GDP's convergence to its potential level. There is some room to reduce the fiscal drag over the next few years while still comply with the fiscal rule and protect a declining path for the public debt to GDP ratio. A scenario in which the structural deficit was kept constant during 2019 and 2020 (at 1.9 percent of GDP) will create space for 0.2–0.5 percent of GDP of additional room for primary expenditure to protect key investment and social programs. In this scenario gross public debt ratio will increase by about 0.8 pp of GDP by 2020 vis-à-vis the baseline but will remain in a declining path.

Illustrative Fiscal Rule Scenarios							
(in percent of GDP)							
	2017	2018	2019	2020	2021	2022	2023
Structural deficit (official parameters)							
Baseline	-1.9	-1.9	-1.7	-1.4	-1.3	-1.0	-1.0
Flat structural deficit	-1.9	-1.9	-1.9	-1.9	-1.5	-1.0	-1.0
Primary expenditure							
Baseline	*16.3*	*15.4*	*14.7*	*14.8*	*14.8*	*14.6*	*14.7*
Flat structural deficit	*16.3*	*15.4*	*14.9*	*15.3*	*14.9*	*14.5*	*14.6*
Gross Debt							
Baseline	50.2	49.9	48.7	46.5	44.4	42.3	40.4
Flat structural deficit	50.2	49.9	48.9	47.2	45.2	43.1	41.2
Fiscal impulse CG (change in the non-oil primary structural deficit)							
Baseline	-0.5	-0.2	-0.5	-0.5	-0.1	-0.1	0.2
Flat structural deficit	-0.5	-0.2	-0.3	-0.2	-0.4	-0.3	0.2

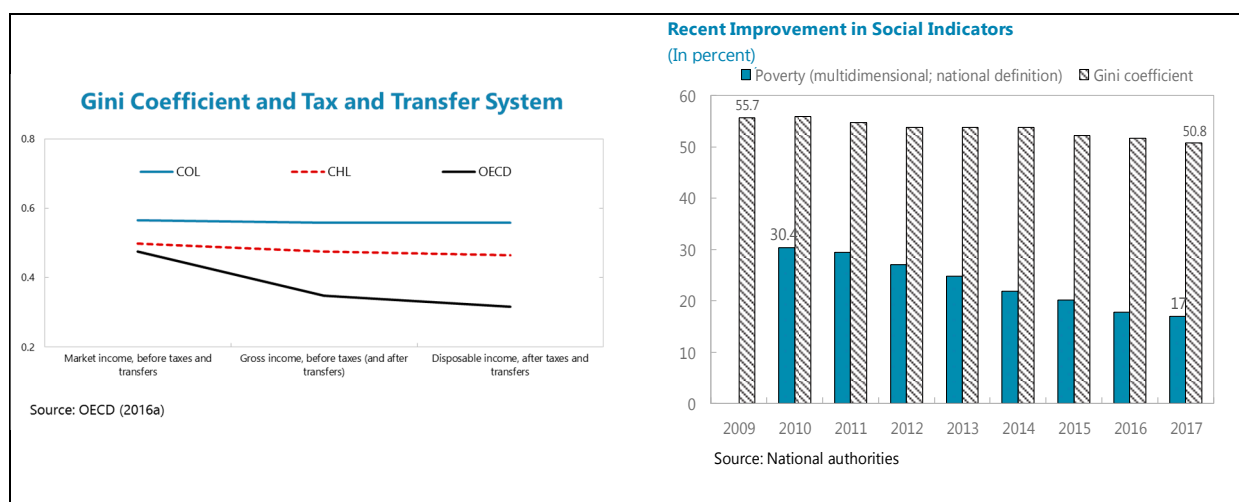Sources: National authorities and Fund staff estimates

B.   Public Expenditure Efficiency and Efficacy[2]

8.   The Colombian government called for an expert commission to provide recommendations to improve expenditure progressivity and efficiency. While the commission focused on how to improve the allocation of the existing expenditure envelope it also highlighted that additional revenue measures would be needed to protect growth-enhancing programs. This section summarizes some of its key findings with special emphasis on recommendations for pension and health reform.

9.   The expenditure expert commission's recommendations would be particularly valuable amid the medium-term expenditure restraint imposed by the fiscal rule and the still large social needs.

---

[2] Based on the Expert Commission's Executive Summary. See references.

- As discussed in the previous section, the combination of the expenditure cuts in response to the oil shock and the additional restrain needed to achieve the medium-term fiscal rule targets will imply that primary expenditure in 2023 will be 2.2 pp of GDP lower than in 2013.

- Colombia has achieved important social gains in poverty and inequality; yet public expenditure progressivity is limited. Income inequality declined from 55.7 percent in 2009 to 50.8 percent in 2017. Colombia's poverty rate declined during 2009–17 from 30.4 percent in 2010, to about 17 percent in 2017 despite the economic slowdown reflect in part progress in revamping social programs. At the same time, recent evaluations still show a very limited progressivity of social transfers in aggregate.
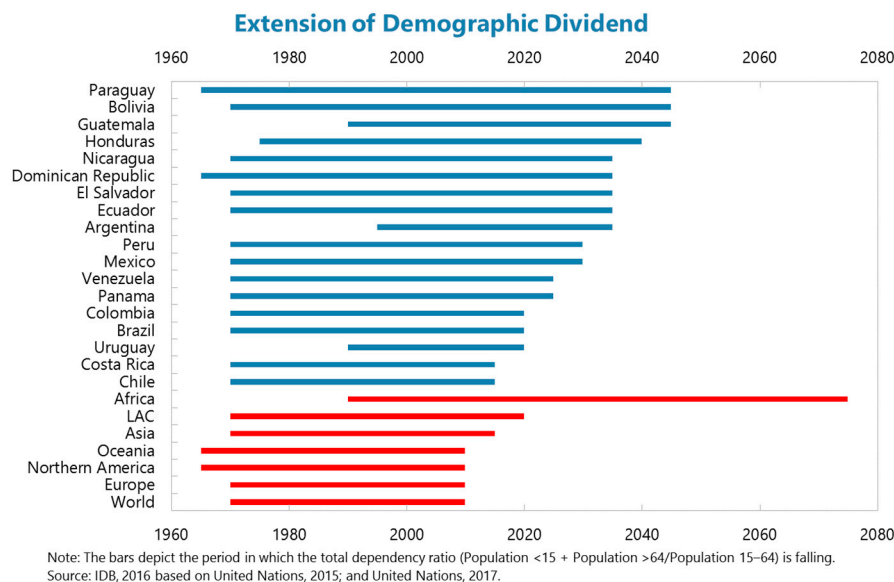

Gini Coefficient and Tax and Transfer System

Source: OECD (2016a)

Recent Improvement in Social Indicators
(In percent)

Source: National authorities

- Pension subsides stand out as among the least progressive in Colombia. About 75 percent of pension subsidies (difference between pension contributions and pension benefits) are received by the top two quintiles and only 12 percent are received by the lowest two quintiles. In contrast, health subsidies are more progressively distributed with 57 of the subsidies being received by the lowest two quintiles.

Social Subsidies Distribution, 2015

Sector	Total Subsidy Amount	Distribution by Income Quintile (%)				
	(in percent of GDP)	1	2	3	4	5
Education (includes job training)	2.97	25.7	23.4	21.4	18.1	11.4
Pensions (includes Colombia Mayor)	2.31	4.3	7.8	13.7	23.4	50.8
Health	1.85	33.7	23.6	19.7	15.1	8
Total	9.0	22.4	19.9	18.8	18.8	20.2

Source: National authorities

- The near-end of Colombia's demographic dividend will create additional social expenditure needs particularly on pension and health.

Extension of Demographic Dividend

Note: The bars depict the period in which the total dependency ratio (Population <15 + Population >64/Population 15–64) is falling.
Source: IDB, 2016 based on United Nations, 2015; and United Nations, 2017.

Expert Commission Recommendations Regarding Institutional Framework

10.   The commission proposes several amendments to the fiscal institutional framework including the budget process. Its recommendations include to unify the current expenditure and investment budget on a program-based fashion, to carry out a detailed evaluation of all the sources of budget inflexibility (such as legally-mandated expenses and transfers) and to improve the flexibility of the oil-royalty system. The commission also proposes the creation of a Fiscal Council to cost government initiatives and assess overall fiscal policy.

Expert Commission Recommendations Regarding Pension Expenditure

11.   *Diagnosis*. Colombian pension system suffers from low coverage (24 percent of the elderly have a pension) and regressive distribution. Competition between the dual pillars (PAYG-DB, and Defined contribution) has created loopholes which lead to higher fiscal cost. Most of the fiscal cost (3.7 percent of GDP) stems from special sub regime (e.g. teachers, military, police). At the same time, low-income programs have been successful to reduce poverty but are underfunded (benefit per person only represents about 5 percent of GDP per capita).

Pension coverage in LatAM
(Percentage of people aged 65+ with a pension)
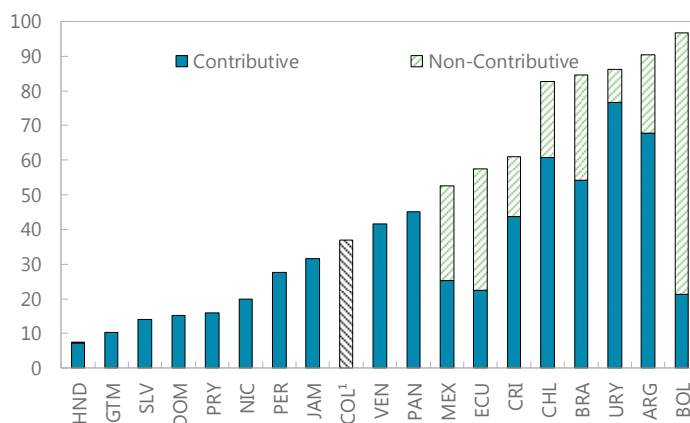
Source: OECD Economic Surveys: Colombia 2015

12. *Reform options*. A pension reform would include both parametric changes (retirement age; contribution rate; etc.) and structural changes. Parametric changes would include an increase in the retirement age and link it to life expectancy changes; increase the number of years used to compute pension benefit (from 10 years to 20 years); increase pension contribution (18 percent); tax high pension benefits. These parametric changes could create the resources to strengthen non-contributory programs (such as BEPS and Colombia Mayor). Structural reform options include to phase out the PAYG system entirely or to transform it in a small pillar 1 which will complement the defined-contribution system. The retirement age and benefits in special sub regimes (e.g. teachers) should be homogenized with the general system's. Further, efforts to further increase labor formality will also contribute to expand the coverage of the pension system.

Social pensions in Latin American countries
(Average pension benefit to income per capita (%))
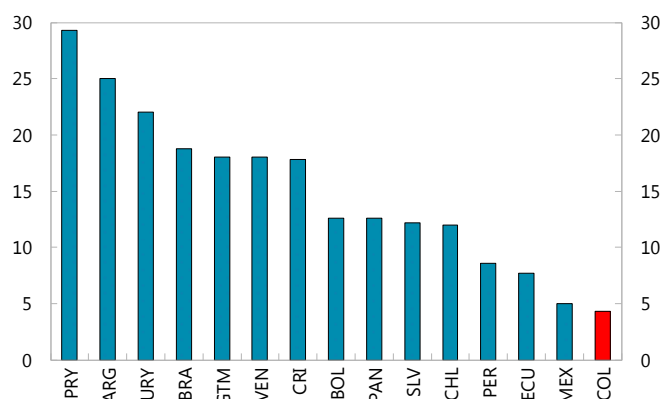
Source: OECD Economic Surveys: Colombia 2017

13.   Expert commission's recommendations also focused on other areas of expenditure:

- **Health**. Despite important gains in coverage, affordability and progressivity, the system could focus more on prevention and provide more incentives for the correct quantification of cost and benefits of medical services. Drugs costs could be reduced by tackling monopolistic structure of part of the industry. Revenue from a remaining payroll tax (*cajas*) could be redirected to fund health services.

Out-of-pocket health expenditure
(As percentage of total expenditure on health)
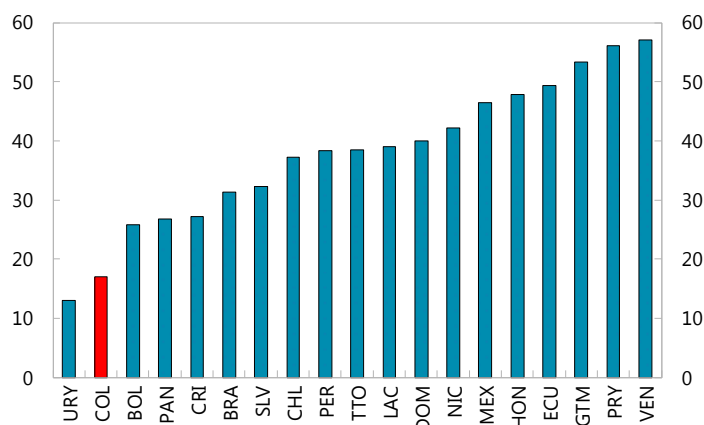
Source: OECD Economic Surveys: Colombia 2017

- **Education**. For early education, coverage has improved in recent years, but access to quality education remains limited. The lack of a clear agency overseeing the education system is also an obstacle. Education funding should be stable and not linked to a particular tax revenue; and funding from local government could be strengthened. For middle-level education the distribution of federal resources to local governments can be made more efficient which would contribute to less quality dispersion across the country. For higher education, the distribution of fiscal resources to public universities should be linked to quality and efficacy.

- **Subsidies.** There is very limited data on the actual amount of fiscal resources used for subsidies and their targeting can be improved. The government current efforts to revamp the subsidies system could lead to additional overhead costs. Reform options include to focus on fewer better monitored subsidy programs and strengthen the evaluation of the largest programs in particular.
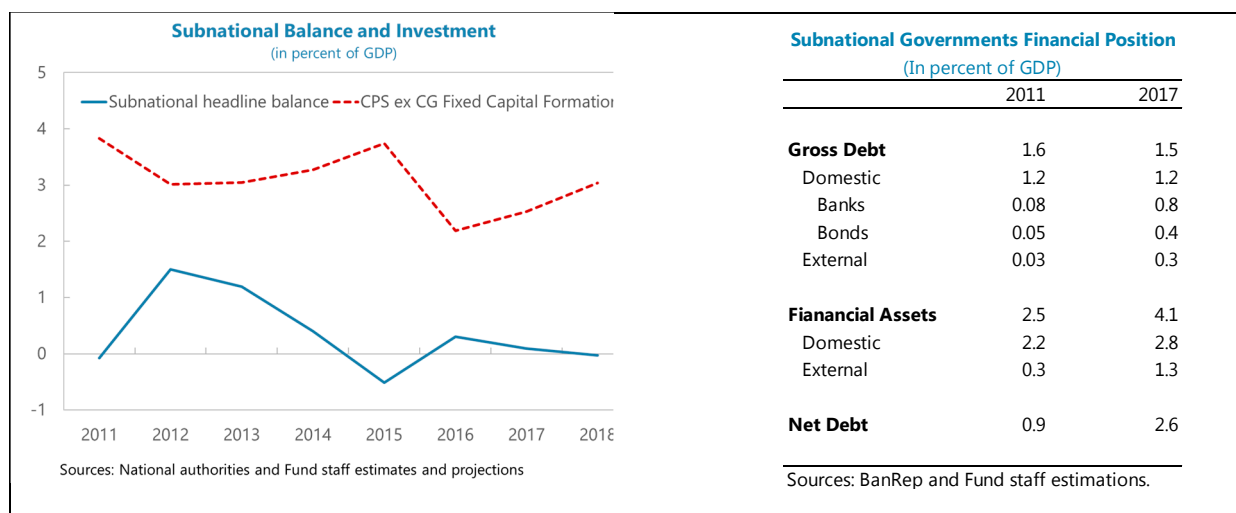
C. Subnational Fiscal Performance

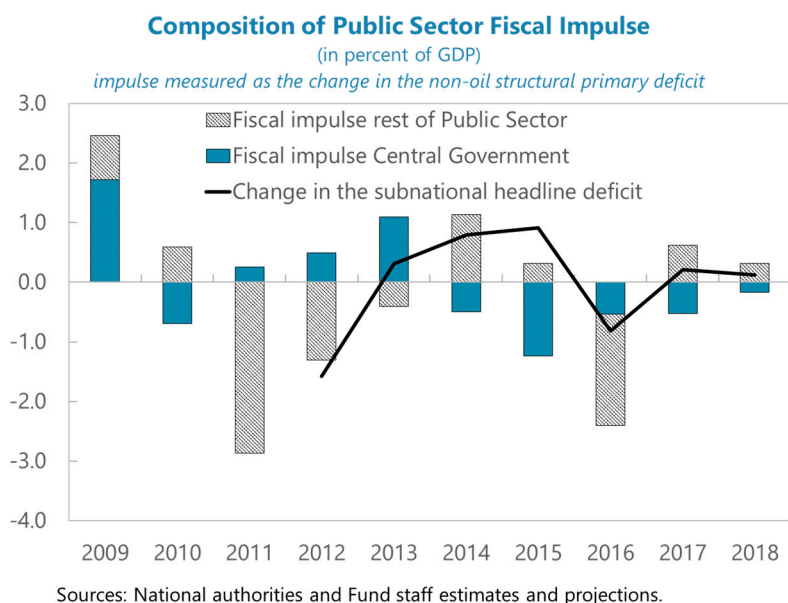**14.   Subnational governments represent an important part of Colombia's fiscal framework.** The medium-term fiscal framework released annually includes qualitative targets for the aggregate NFPS which includes subnational governments. Since 1997, the *traffic-light law* imposes limits to subnational indebtedness and subnational governments are the main target of the bi-annual oil-royalty system.

15.   Subnational fiscal performance partly reflects limited implementation capacity and political cycle. In recent years, subnational headline balance has varied significantly, with strong improvements in the first year of local administrations (e.g. 2012, 2016). Contributing factors to this restraint include some limited inter-administration coordination and the need to build capacity and draw development plans. This fiscal restraint is often reflected in lower public investment. Multi-year public investment projects including those in coordination with other local governments (e.g. infrastructure) are particularly hindered by capacity constraints which often lead to the accumulation of unused resources (see financial asset accumulation in accompanying table).

Subnational Balance and Investment
(in percent of GDP)

Sources: National authorities and Fund staff estimates and projections

Subnational Governments Financial Position (In percent of GDP)		
	2011	2017
Gross Debt	1.6	1.5
Domestic	1.2	1.2
Banks	0.08	0.8
Bonds	0.05	0.4
External	0.03	0.3
Fianancial Assets	2.5	4.1
Domestic	2.2	2.8
External	0.3	1.3
Net Debt	0.9	2.6

Sources: BanRep and Fund staff estimations.

16.   In recent years, significant swings in subnationals' fiscal position have been an important contributor to CPS fiscal impulse. Drivers include relatively weak execution capacity and the political cycle (4-year administrations). Multi-year public investment projects including those in coordination with other local governments (e.g. infrastructure) are particularly hindered by capacity constraints which often lead to the accumulation of unused resources

Composition of Public Sector Fiscal Impulse
(in percent of GDP)
impulse measured as the change in the non-oil structural primary deficit

Sources: National authorities and Fund staff estimates and projections.

17.   Recent fiscal multipliers estimates confirm that in Colombia, public investment can be growth enhancing including by fostering higher private investment. Estimates both by BanRep's Fisco model (Rincon et al 2015) and IMF's FSGM (Andrle et al., 2015) suggest public investment has a higher growth dividend than public consumption. In particular, private investment responds favorably to an increase in public investment hence reinforcing the impact of growth. Banrep's Fisco model even suggest private investment might decline after a surge of public consumption if the increase in the deficit/debt were to lead to future higher distortionary taxation.

References

Andrle, M. et al., 2015, "The Flexible System of Global Models- FSGM," IMF Working Paper No. 15/64 (Washington: International Monetary Fund).

Comisión del Gasto y la Inversión Pública, 2017, Resumen Ejecutivo.

International Monetary Fund, 2017, "The Growth Impact of the 2016 Structural Tax Reform," in *Colombia: Selected Issues*, IMF Country Report No. 17/139 (Washington).

Rincon, et al., 2014, "FISCO: Modelo Fiscal para Colombia," Borradores de Economía Banco de la Republica, No. 855.

Ministerio de Hacienda, 2017, "Presupuesto General de la Nación 2018" PowerPoint presentation.

OECD, 2015, OECD Economic Surveys: Colombia.

OECD, 2017, OECD Economic Surveys: Colombia.