Assessment and recommendations

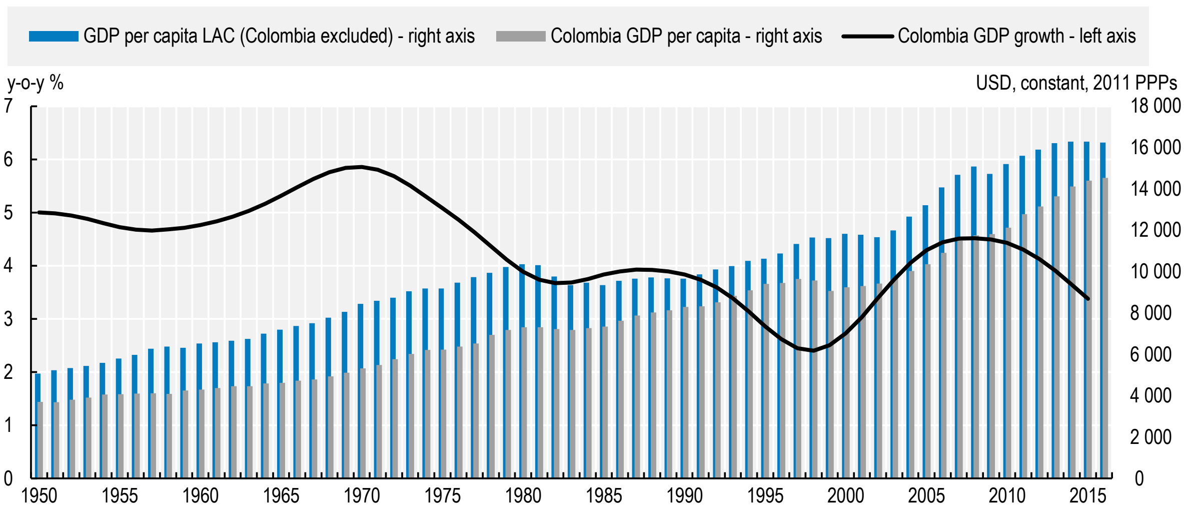
Colombia, a growing economy ready to shift up a gear

Colombia, the fourth largest economy in Latin America and the third in terms of population, is back on stage after decades of conflict. The country has a growing and relatively stable economy, and is looking to open up new opportunities for all its citizens and territories and to set the basis for more inclusive growth.

In the last two decades, Colombia has made much progress. Its citizens live better. The GDP per capita doubled in the period 2000-17, and the economy grew at an annual average of 4.3%, doubling the rate of growth of Latin America and recording the second highest growth rate in the region after Peru (Figure 0.1). In the same period, the poverty rate declined from 50% to 28%. The incidence of poverty is still higher than in other countries in the region, such as Peru (20%) and Chile (12%). More needs to be done but Colombia is on a good track.

Figure 0.1. GDP Colombia, 1950-2017

GDP growth (left axis) and GDP per capita (right axis).



Source: Authors' elaboration based on the Conference Board Total Economy Database™ (Adjusted version), 2017, https://www.conference-board.org/data/economydatabase/.

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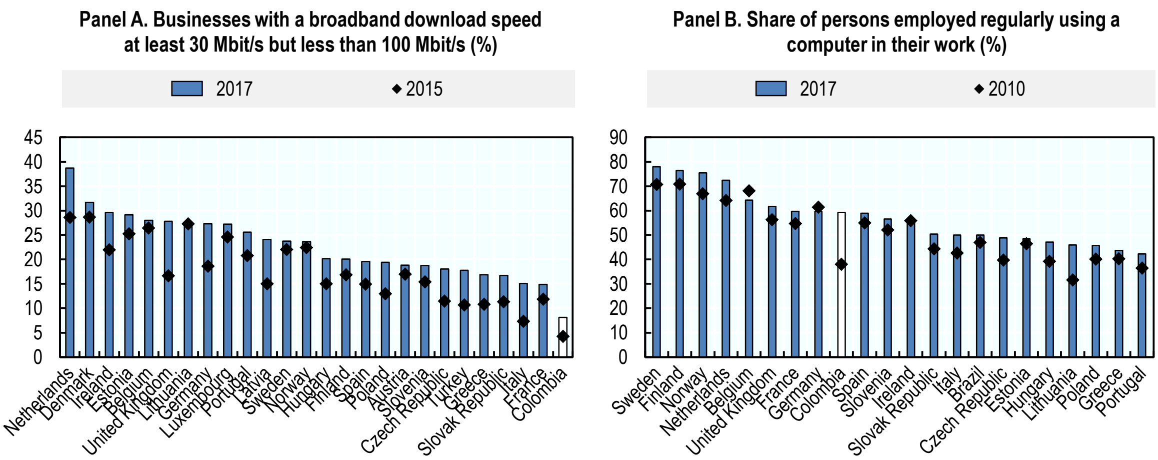
At the same time, investors' confidence has grown and the country has taken steps to re-brand itself as a nation open to business and innovation. In 2017, Colombia's inward stock of Foreign Direct Investment (FDI) reached 59% of GDP, ranking among the highest in the Latin America and Caribbean region and above the OECD average. In addition, a growing number of countries are looking at Colombia as a place to invest and do business. In the 2000s, the top three investing countries accounted for half of the total FDI to the country. Now the top three account for 40%. Brazil and China count among the new top investors while the United States remains the main trade and investment partner of Colombia.

More recently, the country has invested in improving digital connectivity. The number of broadband subscriptions per 100 inhabitants doubled from 6 to 12 in 2010-17, putting Colombia on a par with Mexico, but still among the lowest levels in OECD. The top OECD country in this respect (Switzerland) has three times the number of broadband subscriptions per inhabitant compared to Colombia.

Progress on broadband infrastructure, coupled with growing middle classes, and targeted policies, has also allowed Colombia to reap the benefits of a growing start-up scene in Latin America. Colombia is now the fifth largest hub by number of start-ups in Latin America, after Brazil, Mexico, Argentina and Chile, and the fourth largest by venture capital (VC). Start-ups have allowed new businesses to flourish. They have also contributed to improving the image of Colombia as a place to do business and innovate. Medellin, for example, has developed an effective public-private partnership (Ruta N) that provides financing and services to start-uppers. In 2016, after years of headlines as a city of crime, Medellin was named Innovative City of the Year by the Wall Street Journal and Citi Group.

Established firms in Colombia are also starting to use digital technologies for business. The share of businesses with high-speed broadband internet connections doubled in 2015-17. Even though their share in Colombia (8%) is still much below other OECD economies, such as Italy (15%) and the Netherlands (39%), the country has shown signs of improvement (Figure 0.2). In e-commerce, Colombian firms outpace the OECD. On average, 30% of domestic firms are engaged in digital trade, against an OECD average of 22%.

Figure 0.2. The connection speed and use of computers for businesses have increased



Note: Business enterprises refer to firms with ten or more persons employed.
Source: Authors' elaboration based on OECD Broadband Statistics 2018 http://www.oecd.org/sti/broadband/broadband-statistics/.

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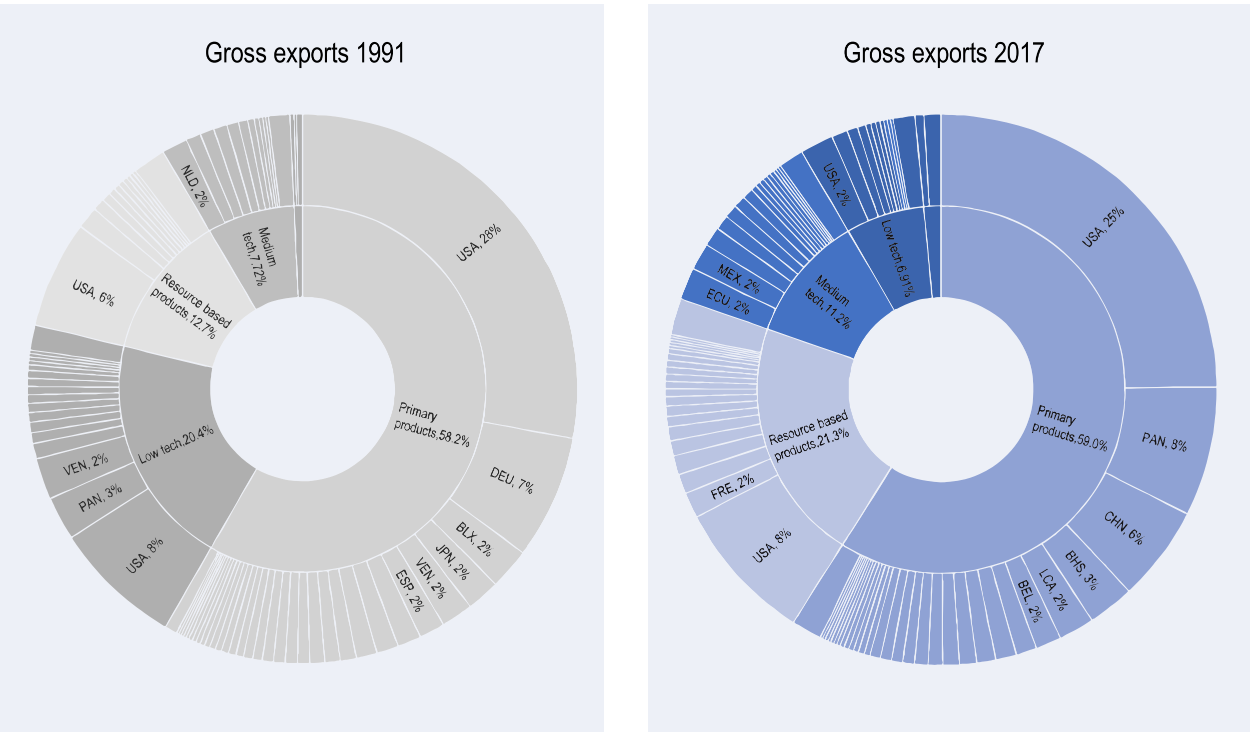
Persistent structural weaknesses are holding back future progress

Despite the progress achieved over the last two decades, Colombia still suffers from structural weaknesses that are hampering future progress.

Colombia is highly dependent on natural resources. In 2017, primary production and mining accounted for 80% of exports, 10% more than in 1991, in line with other countries in the region such as Brazil (Figure 0.3). In addition, despite a relatively long tradition of manufacturing this activity is becoming progressively less relevant and less competitive. The share of manufacturing in GDP is now half of what it was in the 1980s and domestic manufacturing is struggling to compete in global markets. In 1990-2015, Colombia fell in the Competitive Industrial Performance Index, which benchmarks the ability of countries to produce and export manufactured goods competitively, from the 57th to the 69th position. During the same period, Chile increased from 58th to 51st and Mexico from 31st to 19th.

Figure 0.3. Exports by partners and technology intensity, Colombia, 1991-2017



Note: The technological classification follows Lall, S. (2000) and Aboal et al (2015).
Source: Authors' elaboration based on UN (2018), Comtrade Database, https://comtrade.un.org.

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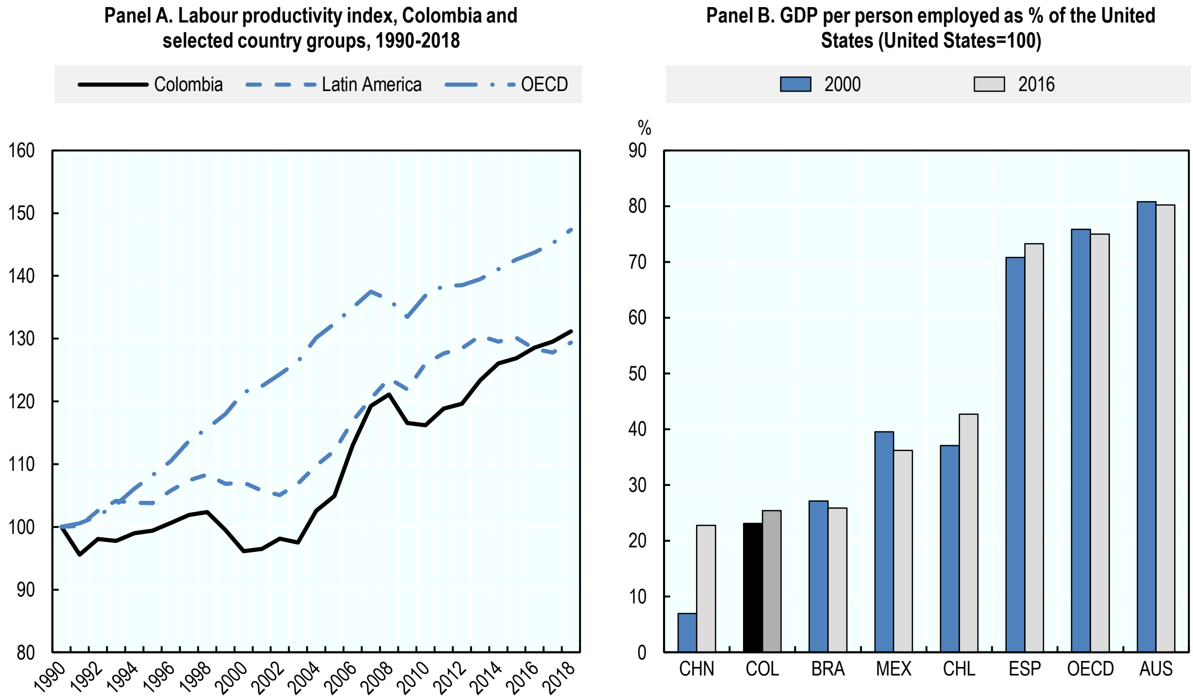
Productivity has not increased enough to bring Colombia up to the level of more advanced economies. Since the 2000s, Colombia's labour productivity has been stable at 25% of that of the United States (Figure 0.4). In contrast, during the same period, China's productivity gap relative to the United States decreased by 400%.

Figure 0.4. The productivity gap persists in Colombia



Source: Authors' elaboration based on the OECD National Accounts and Conference Board Total Economy Database™ (Adjusted version), 2018, https://stats.oecd.org/; https://www.conference-board.org/data/economydatabase/.

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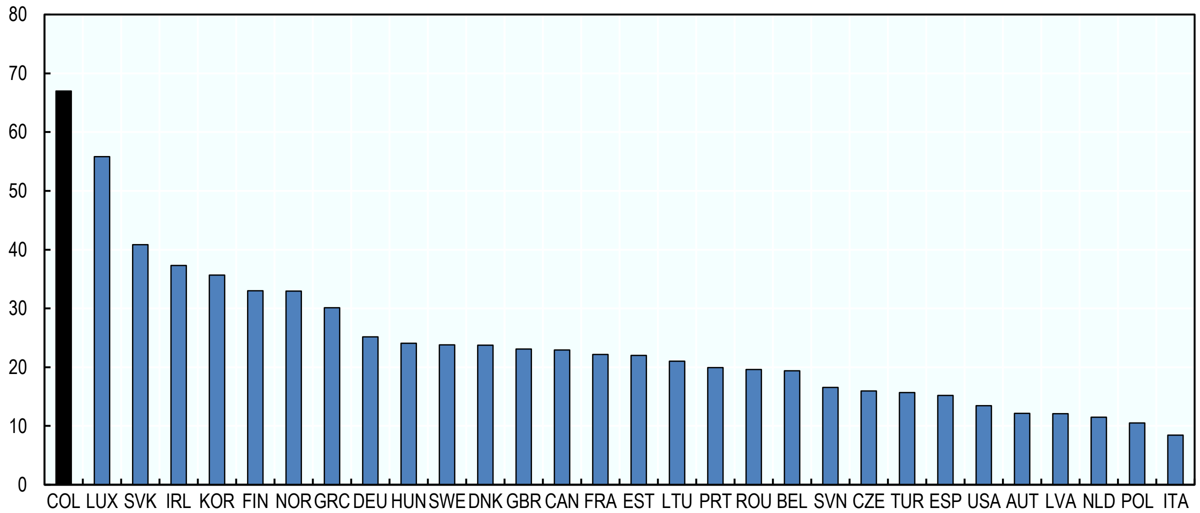
The structure of firms could be stronger and more diversified. Micro-firms account for 92% of total domestic firms, versus an OECD average of 80%. In addition, even though a growing number of firms are created every year (this number increased by 15% in 2001-15), seven out of ten firms fail within five years. At the same time, only a handful of companies benefit from trade. The top ten exporting firms account for 65% of exports. In contrast, in Spain and Germany these firms account, respectively, for 16% and 25% of exports (Figure 0.5).

Economic opportunities continue to be limited to a few territories. This is a common feature in Latin America, where territorial disparities are severe in several countries, including Chile and Brazil. Within the OECD, Colombia suffers from the second highest labour productivity gap between regions, after Mexico (Figure 0.6). Nariño, a small department with an agricultural vocation located in the southwest of the country, is 2.5 times less productive than the national average, and six times less productive than Meta, a territory specialised in mining and the top region for labour productivity. While heterogeneity in productivity across regions is common, an excessively high disparity reduces the aggregate productivity potential of the economy and limits the development of effective national supply chains. In Spain, for example, the top region (the Basque Country) is only 1.6 times more productive than the bottom region (Murcia). The gap between the top and the bottom in Colombia is more than three times higher. In addition, only a few regions are benefiting from growing FDI inflows. In 2015-17, three regions, Bogotá, Cundinamarca and Antioquia, accounted for more than 60% of total FDI inflows (Figure 0.7).

Figure 0.5. The top ten exporting firms account for 65% of exports

Share of top ten exporting firms of total value of exports, Colombia and OECD, 2015, or latest available year



Note: Data for BEL, CAN, CZE, ESP, EST, FIN, GBR, IRL, LUX, NLD, NOR, POL, ROU, USA, TUR refer to 2014.
Source: Authors' elaboration based on OECD TEC database, OECD SDBS database and RUES database - Registro Unico Empresarial [Single Enterprises Registry]-Confercamaras, Colombia, 2018 http://www.oecd.org/sdd/its/trade-by-enterprise-characteristics.htm; http://www.oecd.org/sdd/business-stats/; https://www.rues.org.co/.

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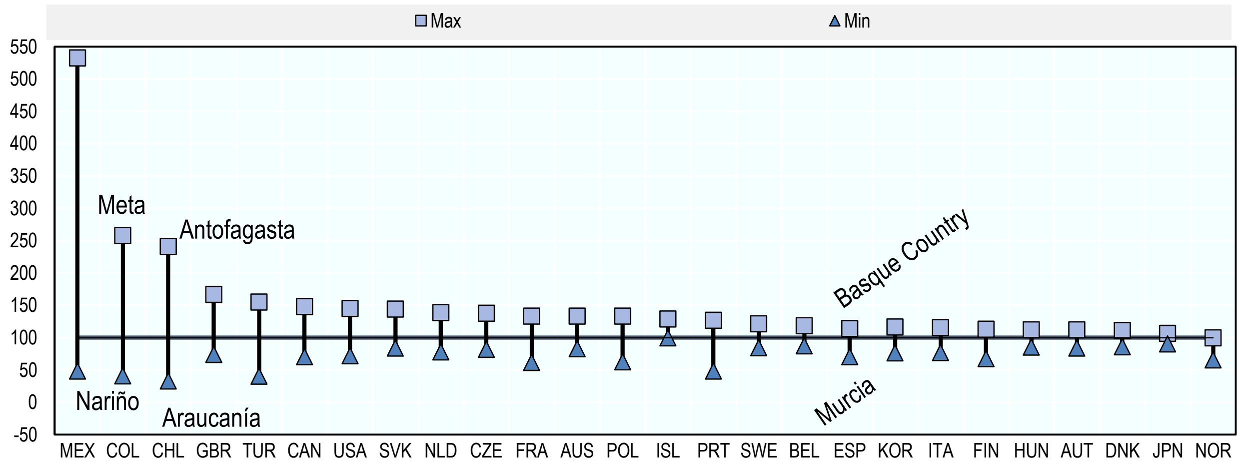
Figure 0.6. Regional variation in labour productivity, Colombia and selected countries, 2016

National average =100



Source: Authors' elaboration based on OECD Regional Statistics database, 2018. www.oecd.org/governance/regional-policy/regionalstatisticsandindicators.htm.

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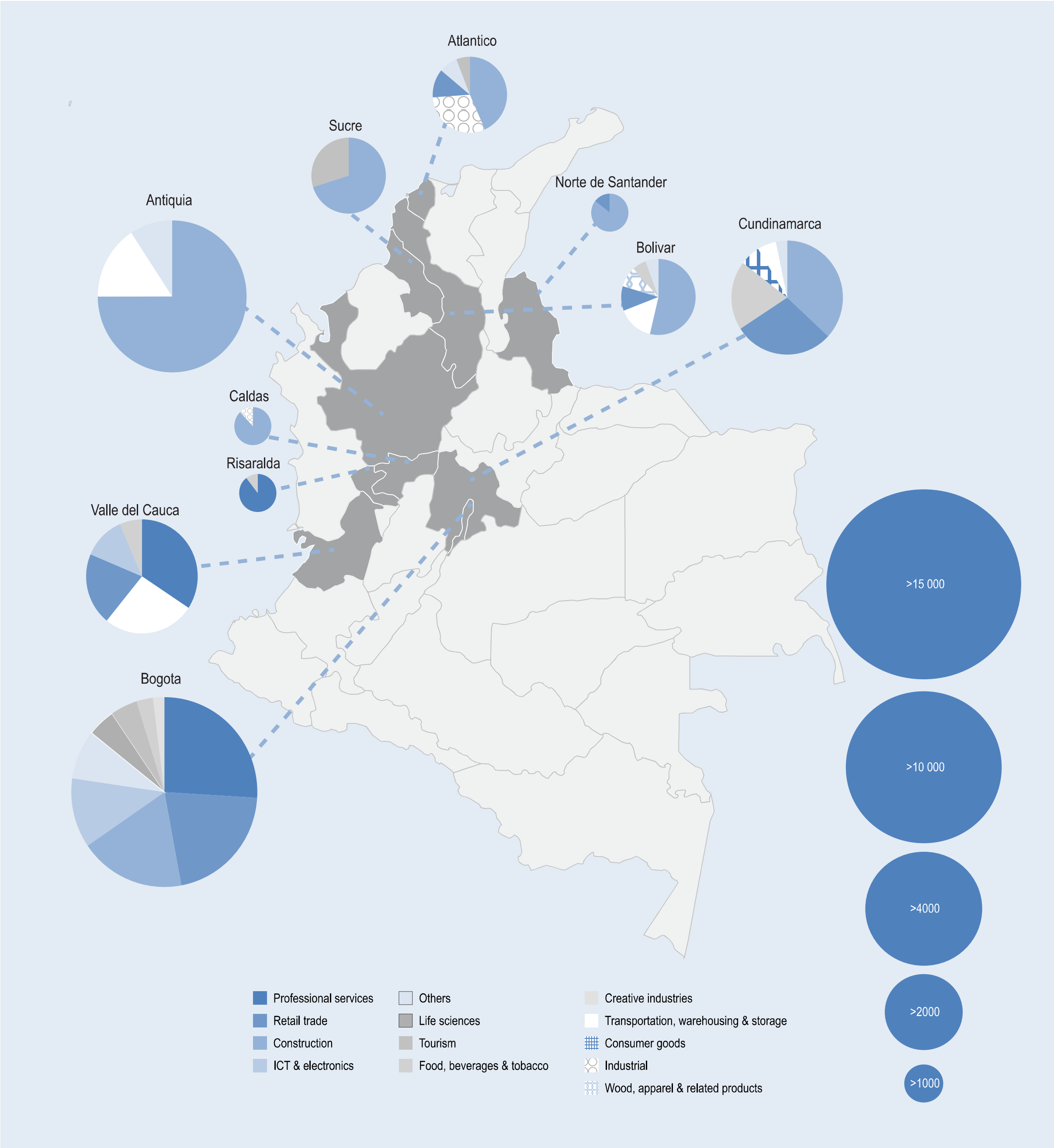
Figure 0.7. Three regions account for 63% of total FDI in Colombia

Share of total jobs created by Greenfield FDI by department and economic activities, Colombia 2015-17



Note: Only departments that account for at least 1 000 jobs created are displayed. Total jobs created in 2015-17 are 56 691 units. Nevertheless, only 49 505 jobs associated with complete information in terms of destination city and economic clusters are taken in consideration.
Source: Authors' elaboration based on Financial Times fDi Market database, 2018, https://www.fdimarkets.com/.

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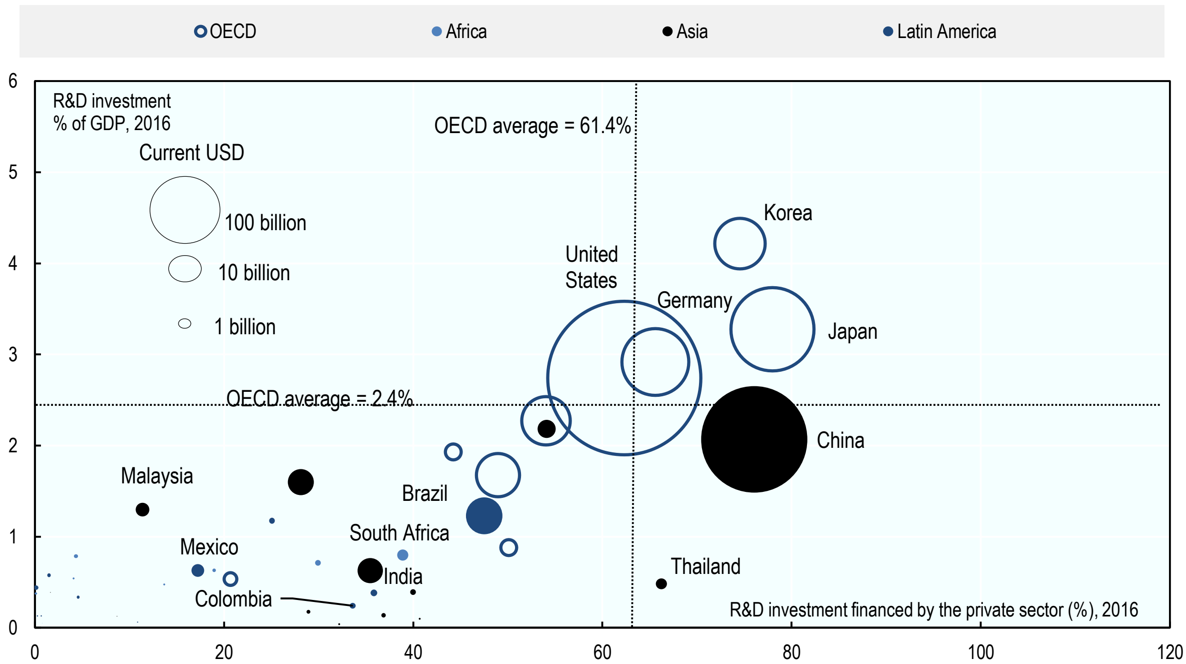
Colombia continues to invest little in innovation. The research and development (R&D) expenditure as a percentage of GDP is stable at around 0.25%, well below the OECD average of 2.35%, and even below other countries in Latin America, such as Chile (0.39%), Mexico and Argentina (both around 0.5%), and well below the top R&D investing country in the region, Brazil (1.2%). The private sector is also not investing enough. Business expenditure on R&D in Colombia is 0.11% of GDP, 20 times less than in Korea and 15 times less than the OECD average (Figure 0.8). The private sector gap in innovation is particularly high in Colombia for SMEs – only 21% of them innovate versus 35% in Spain and 65% in Germany. However, the economy counts with a relative advantage in Latin America. According to available data from national innovation surveys, large firms in Colombia innovate more than their peers in other countries of the region. In Colombia, 46% of large firms innovate, while, for example in Chile only 30% of these companies innovate. While this performance is still low compared to top performing economies such as Spain and Germany, where 77% and 94% of large firms innovate, it is still a good basis. Colombia could further capitalise on its large companies' culture and propensity to innovate to fast track technology adoption and creation in the whole economy (Figure 0.9).

Figure 0.8. Colombia invests little in R&D

Colombia is investing few resources in R&D



Note: GERD: Gross domestic expenditure in research and development; BERD: Business expenditure in research and development.
Source: Authors' elaboration based on OECD Main Science and Technology Indicators and OCYT Informe Anual de Indicadores de Ciencia y Tecnología 2017 and UNESCO Institute for Statistics http://www.oecd.org/sti/inno https://ocyt.org.co/ http://data.uis.unesco.org/.

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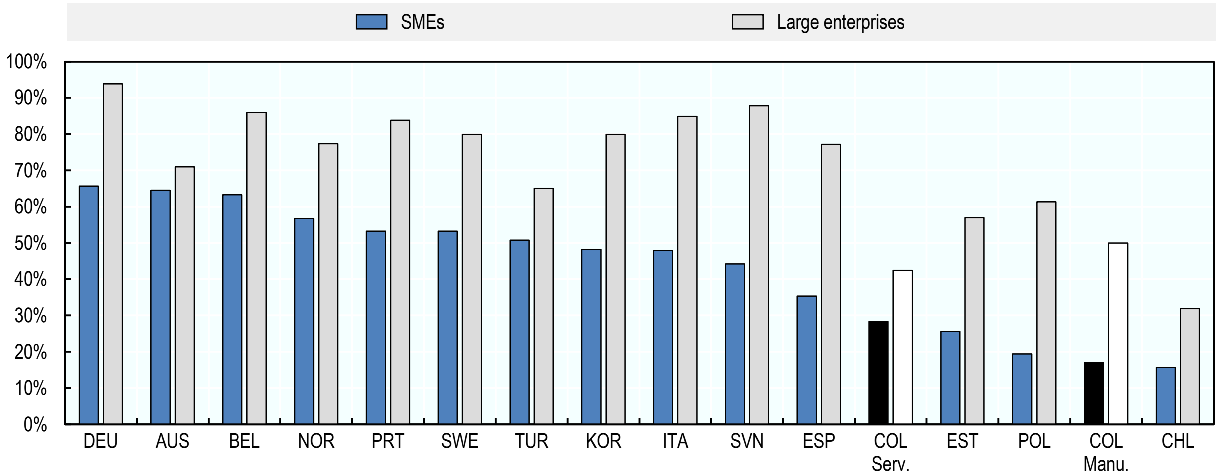
Figure 0.9. On average only 20% of Colombia's firms innovate

Share of innovative enterprises by size, Colombia and selected countries 2016



Source: Authors' elaboration based on EUROSTAT CIS 12 and 14, Colombia Manufacturing Innovation Survey EDIT-VIII and Services Innovation Survey EDITS-V, Chilean Enterprises Innovation Survey – IX, 2018, https://ec.europa.eu/eurostat/web/microdata/community-innovation-survey; https://www.dane.gov.co https://www.economia.gob.cl.

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Since 2006 Colombia has implemented reforms to fast-track economic transformation

To continue to progress, Colombia needs to address structural weaknesses holding back its development. To do so, the country can count on an established and well-respected planning structure, a set of public and private institutions with a tradition of debating and sharing ideas, and a track record of policies for production development.

The National Planning Department (DNP) was founded in 1958 as the centre for national strategic planning. It formulates the National Development Plan, draws up the budget in co-operation with the Ministry of Finance and Public Credit, and defines national policies that require inter-ministerial co-ordination. In defining policies for transforming the economy, Colombia can count on a set of well-established private sector institutions. These include the National Industrial Association (ANDI), set up in 1944, the National Confederation of Chambers of Commerce (Confecámaras), founded in 1969 to bring together the 57 local chambers, and the Private Council for Competitiveness (CPC), founded in 2011 as the body to convey large firms views on national policies for competitiveness.

The evolution of policies for production development in Colombia has followed a path similar to that in other Latin American countries. The initial industrialisation policies of the 1930-40 suffered a halt from the 1980s, and particularly in the 1990s, when the country focused on modernising the economy through openness. Since the mid-1990s, different governments have tried to define and implement policies to foster competitiveness and innovation in the economy. This has resulted in no fewer than

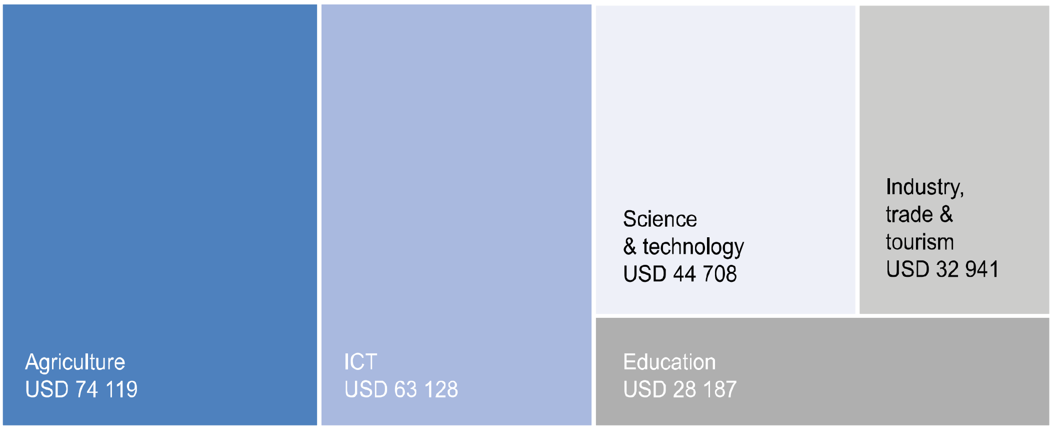
11 programme documents in the period 1994-2018, but the lack of continuity in priorities and limited funding hampered implementation. In the last decade, the country has nevertheless implemented some reforms to address the productivity challenge. The most significant reforms include:

- Strengthening institutionality for science and technology. In 2019, the law 1951, transformed the Colombian Institute for Science and Technology (Colciencias) in the Ministry of Science, Technology and Innovation.
- Promoting industrial development in priority areas and fostering start-up promotion. In 2008, the Ministry of Trade, Industry and Tourism (MinCIT) launched the Productive Transformation Program (PTP) to stimulate competitiveness in 15 priority areas. In 2012, Colombia also established a new agency, iNNpulsa, to foster start-up development and business innovation.
- Modernising trade and investment institutions. In 2014, the national export promotion agency was transformed into ProColombia, merging the export promotion and the FDI attraction function, in line with OECD practices. In 2003, the national export development bank, Bancoldex, absorbed the functions of the former Institute for Industrial Development (IFI) and became responsible for facilitating access to finance for SMEs.
- Fast-tracking digital connectivity. In 2011, the Ministry of Information and Communications Technology launched the agenda *Vive Digital* to mobilise investments and implement reforms to improve digital infrastructure. This resulted in a major increase in digital connectivity. By 2017, 98% of municipalities were connected to the internet.
- Improving institutions and financing for regional development. Following on initiatives that go back to the mid-1990s, in 2006, 33 Regional Commissions for Innovation and Competitiveness (CRC) were established to foster innovation and production development in regions. In 2009, the regional development governance was further strengthened with the establishment of departmental Councils for Science, Technology and Innovation (CODECTI). In addition, in 2012, Colombia reformed its national royalties' system to allow all regions, and not only the mining ones, to receive royalties from extractive industries. The reform also included an amendment that earmarked 10% of these royalties to fund science, technology and innovation projects in regions.
- Modernising the quality infrastructure for competitiveness. Colombia has had a National Institute for Technical Standards and Certification (ICONTEC) since 1963. The country took steps to update its quality infrastructure system by creating a national agency in 2008, in charge of overseeing the technical competence of conformity assessment bodies, (*Organismo Nacional de Acreditación de Colombia*, ONAC), and in 2011, the National Metrology Institute (INM), which offers metrology services in line with regional and international best practices. Colombia today has a national quality infrastructure system on a par with regional leaders, such as Argentina, Brazil and Mexico.

Despite this progress, production development has struggled to become a key priority in the national development agenda. Colombia still lacks a shared, ambitious vision and a clear policy stance for transforming the economy. The Production Development Policy (PDP) 2016-2025 represents a step forward in this respect. The PDP was drawn up by the DNP in co-operation with several entities, including the Ministry of Trade, Industry and Tourism, the Ministry for Agriculture and Rural Development, the Ministry of National Education and the Ministry of Labour, and the National Training Service (SENA). It aims at increasing the productivity and export performance of existing firms by bringing together policy tools and financing managed by different ministries (Figure 0.10).

Figure 0.10. The PDP allocated budget by area, 2018

PDP budget 2018, Total USD 243 million



Note: The total budget of the PDP refers to the sum of each (financial and non-financial) instrument that reports financial resources. Industry, trade and tourism accounts for three instruments active in 2017. For agriculture, science & technology, and industry trade and tourism, the aggregate budget of some specific instruments is split according to the evolution of the budget of each ministry across the years.
Source: Authors' elaboration based on 2018 National Budget Law (Ley No. 1873-20/122017) and DNP information.

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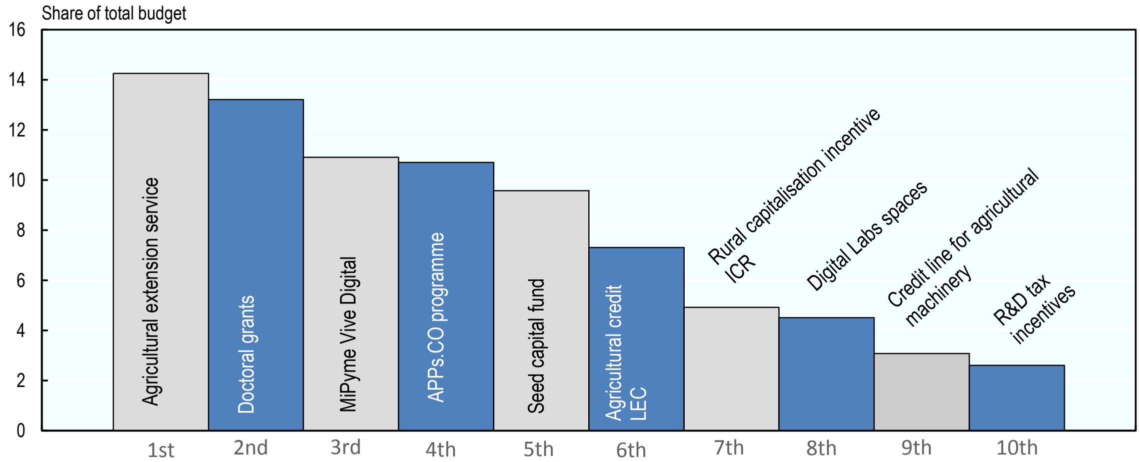
Even though the PDP has a policy mix with 83 instruments that can be mobilised by different ministries and implementing agencies to channel financing and services to firms, people and other institutions in the national innovation system, 10 of these account for more than 80% of the overall budget. Agricultural extension services are the most important tool and account for 14% of the total allocated budget for 2018. These are followed by non-repayable contributions to pursue PhDs (13%) and a mix of co-financed loans and services to foster the use of digital technologies by SMEs (11%) (Figure 0.11). Initiatives in science and technology and in industrial development are dispersed among many small and specific programmes. This undermines the capacity to engender a transformative change in the economy.

Figure 0.11. Ten instruments account for 80% of the PDP's allocated budget, 2018



Note: The Apps.co is a programme launched by the Ministry of Information and Communications Technologies (MinTIC) within the framework of its Plan Vive Digital to promote new businesses based on the use of ICT, with special emphasis on the development of mobile applications and software content.
Source: Authors' elaboration based on DNP information and Colombian Observatory on Science and Technology (OCYT, 2018[1]).

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Nevertheless, the PDP represents an advance. On the one hand, it sets goals until 2025, providing a basis for strengthening continuity in government support for production development. On the other hand, it is based on three principles that enable to define clear priorities through consensus building with key partners in every territory in the country (Table 0.1). The key principles are:

- *Regional differentiation:* identifying, through a participatory process, priority sectors in regions, based on productive capacities and comparative advantages in exports.
- *Evidence based:* applying a rigorous empirical methodology for identifying priority sectors and including piloting of actions as a pre-condition for scaling-up.
- *Participatory and co-ordinated:* including an articulated mechanism of co-ordination between different private and public stakeholders. The PDP also makes a step forward in advancing towards a place-based approach to policy by giving a key role to the Regional Commissions for Competitiveness.

Table 0.1. Progress overview of the Production Development Policy, 2016-2025

Governance dimensions		
Anticipation capacity	x	The policy aims at providing guiding principles until 2025, but it falls short in anticipating future potential scenarios and in taking into account the impact of the ongoing digital revolution. Increasing future-oriented strategic thinking would be required in defining priorities. Industrial development strategies work better when they have clear targets that, at the same time, leave room for manoeuvre to the private sector.
Adaptation capacity	√	The PDP fosters piloting actions before scaling them up and includes a monitoring mechanism that can support policy reforms if targets are not achieved.
Learning and upgrading potential	x	The PDP falls short in identifying future issues. Future efforts would benefit from putting a clearer emphasis on Industry 4.0, new technologies and innovation and in exploring how to unlock the transformative potential of large firms in the country. The prioritisation process identified key products and activities in each region. This approach risks limiting the potential for identifying big challenges and promoting broad innovations across the whole system. A production development policy would need to be defined in line with the national innovation strategy. Addressing the issues in two separate policy documents increases co-ordination failures.
Interconnectedness propensity	≈	**Within government**. While the PDP has a Technical Committee for follow-up to which all relevant government agencies are invited to participate, the PDP would benefit from explicit co-ordination with the innovation policy and with the digital agenda. The practice of addressing each issue in separate programme documents limits the possibilities for effective co-ordination.
	√	**With the private sector**. The PDP has spaces for co-ordination with the private sector. ANDI and CPC are members of the Technical Committee of the PDP and regularly contribute to policy definition. Their participation in this committee facilitates information-sharing. More could be done to mobilise private financing in specific lines of work of the PDP.
	√	**Regional entities**. The PDP works hand-in-hand with all regional governments and private sector representatives.
Embeddedness potential	≈	The place-based approach of the PDP is a positive step. There is a need to examine regional disparities related to financing, administrative capacities and defined mechanisms in order to offer more support to the regions.

Note: √: positive progress; ≈: room for improvement; x: reform needed. This progress overview contains information updated to October 2018.

Three game changers for a competitive, innovative and inclusive nation

For Colombia to realise its potential of a competitive and innovative nation while at the same time offering new opportunities to all its territories and people, the country needs to come to grips with transforming its production base and international insertion. To do so, Colombia needs to leverage on its institutions and experience in policy planning to achieve a shared vision for the future and to create the conditions for implementing it, with a time-horizon that goes beyond the political cycles. Throughout the PTPR, three game changers emerged as key to enabling the country to move forward.

Strengthening the government's planning and anticipatory capacities to shape the future

Colombia has a sound planning process. The country needs to update it to cope with a fast-changing global landscape and to respond to growing demands for accountability and transparency. Colombia also needs to modernise its planning structure to respond to growing societal demands for a quicker path to prosperity, as well as to the private sector call to achieve a more stable, sustainable and pro-business environment.

Using the strength and competence of its bureaucracy and the practice of consultation between different government bodies and the private sector, Colombia could update its planning structure by:

- Creating new incentives to shift the focus from drawing up documents to achieving a shared commitment to budget allocation and policy implementation. This commitment needs to be long-term to provide a major national vision for transforming the economy. A step forward in this direction could be including, as mandatory participation of the Ministry of Finance and Public Credit in the SNCCTI at strategic (Executive Committee) and technical levels (Technical Committees).
- Favouring an inclusive government planning process by requiring that planning documents address national policy challenges instead of specific policies linked to specific ministries. In this way, related topics would be handled in a synchronised way. This would reduce the number of documents elaborated for the CONPES and therefore the number of associated Technical Committees, and make planning more effective. In the past, science and technology, digitalisation and production development were addressed through separate planning processes and discussed in different Technical Committees. This undermined the capacity of national policies and tools to act in a co-ordinated way. The creation of the Ministry for Science, Technology and Innovation could facilitate a better articulation between trade, competitiveness, digitalisation and innovation agenda. The recent introduction of the Delivery Unit in the Presidency of the Republic also aims to respond to this co-ordination challenge. In going forward, this could be instrumental in updating the role of the DNP in the national governance system as strategic centre for policy planning endowed with more operational, results-oriented and forward-looking capacities. Some countries, like Malaysia with PEMANDU, have temporarily linked similar units to the Presidential office and then transferred their powers back to the reformed planning body.
- Advancing in ensuring the participation of all stakeholders to the strategic thinking process. Colombia has made progress in this respect; the PDP 2016-2025 facilitated co-ordination with all regions in the country and across ministries. Consultation with the private sector is now a fact. In going forward, it would be desirable to involve in the consultation an association representing the entrepreneurs to better factor in voices for change. To ensure a better participation of regional actors, Colombia could consider setting up a Conference of Regional Competitiveness Commissions (CRCs) with a rotating presidency. The president in charge could represent the CRCs in the Technical Committees of the SNCCTI to ensure an effective national-regional concertation.
- Endowing the DNP with a centre for strategic thinking and policy foresight. In line with good international practices, Colombia would benefit from increasing its strategic and forward-looking capacities by institutionalising a function to explore future issues and identify new challenges and opportunities. The DNP would seem the right body to host this function to ensure that the results of the strategic foresight processes are embedded in the national strategy as well as in different policies. Targeted training for experts in charge would also be needed and should be included in the overall training of public officials.

Tapping Colombia's productivity potential in all its regions

Colombia can build on its track record of policies and reforms to foster production development. The PDP 2016-2025 represents a step forward, but more needs to be done. Production development policies need to be given higher priority in the national strategy. Only if this is done they will achieve the level of co-ordination, continuity and funding needed to have an impact.

To unlock its competitiveness potential Colombia needs to enable all regions and territories to develop. This requires a two-track approach. The country needs to get the enabling factors right. Red tape and a poor communication infrastructure are holding back productivity and the competitiveness of firms. At the same time, it needs to consolidate past policy efforts and update them by acting on the following issues:

- Improving the prioritisation process. Defining policies based on evidence, as the PDP has done, is a good practice, but international experience shows that, in defining priorities for a national strategy for industrial and production development, a challenge-driven and place-based approach works better. Instead of prioritising products, using a mix of consensus building and pre-identification of activities with export potential based on available trade data, priorities could be better formulated in terms of major national challenges. Addressing key issues such as mobility or greening the economy could provide a clearer indication of major goals to achieve, offer public research institutes common goals to work toward, and provide room for the private sector to organise and co-invest in business and technological development. In defining priorities, it is important to take into account not only administrative regions, but also functional areas, sharing economic characteristics and vocations. This would make policy implementation more effective. It would facilitate the identification and provision of public goods and avoid duplication of efforts, and would transform regional policy into a key driver of national strategy. Working with functional regions requires mechanisms to enable cross-regional and cross-departmental co-operation, such as consortia or pacts for development.
- Openly addressing the opportunities and challenges of Industry 4.0, both for established industries and potential new ones. Colombia has advanced on digital connectivity, and it has taken steps to enable its SMEs to make better use of digital technologies for business. The country needs to complement the current policy focus on technology adoption by identifying potential areas in which it can become an innovator and a creator of knowledge-based solutions (Table 0.2). The setting up of a Ministry for Science, Technology and Innovation can be an important step in this direction, if it will be endowed with a proper budget and if adequate co-ordination mechanisms with the Ministry of ICT and of Industry and Commerce will be established. Several countries, from Germany to Italy, Spain and Chile, are taking steps to benefit from Industry 4.0. The governance of these emerging initiatives is specific to each country and region, but two key features are present in all approaches. There are cross-ministerial committees in which the agencies in charge of digitalisation or the ministries for information and communication technologies (ICT), participate. Furthermore, there are specific public-private committees where the government, the business community (both existing industries and large firms, and small firms and entrepreneurs) academia and research institutions meet to define priorities and respective funding needs and responsibilities. In going forward, Colombia needs to update governance for

production development by including the ministry for ICT in the technical committee in charge of the policy for production development, trade and innovation. Involving workers' associations in these committees would also help achieve better solutions. In Germany, for example, trade and labour unions are actively involved in the public-private dialogue to define the national vision for Industry 4.0.

Table 0.2. A key challenge for Colombia is to shift from technology adoption to creation

	Short term: Adopting digital technologies	Medium and long term: Innovating through digital technologies
Objectives	Improving quality of and access to internet infrastructure Fast-tracking technology adoption in businesses (processes, products, services and organisation) Favouring start-up development and enabling experimentation	Developing new products and services based on digital technologies
Lines of action	Public-private partnerships for infrastructure development. Financing and fiscal incentives for firms to facilitate digital transformation Services to raise awareness and transform mindsets to facilitate technology adoption Updates in public procedures and training for public officials to manage digital programmes for firms Targeted short-term training for entrepreneurs and workers to facilitate technology adoption	Public-private partnerships for strengthening the science and technology infrastructure Public financing for digital research and development through a mission-oriented research fund Public-private financing for disruptive innovation Public investment in innovative training of highly-skilled scientists, engineers and innovators
Beneficiaries	Start-ups, existing firms, employees	Start-ups, existing firms, research and technology centres, networks of innovators

Source: Authors' elaboration based on the High Level Consensus Building Event co-organised by the OECD Development Centre, DNP, ANDI and CPC in Bogotá, Colombia in October 2018.

- Better use of available resources of the funds from National Royalties System. The earmarking of 10% to regional innovation represents a positive reform. Colombia is also progressively making the royalties system more effective. Since 2018, the limitation that only public actors could present projects for approval has been removed, allowing private entities to present project proposals and obtain funding to implement them. The mechanism for project selection and disbursement is, however, quite cumbersome and, in many cases, available resources are not actually used. It is important simplifying the procedures and making them more operative, as well as establishing mechanisms to support weaker regions in developing high quality projects.
- Introducing a national challenges innovation fund. Colombia lacks instruments to address big challenges. The innovation fund in the National Royalties System can only finance projects presented by and implemented in the regions. The fund operates more as a series of regional innovation development funds than as a national innovation fund. Colombia could overcome this gap in financing mechanisms by introducing a para-fiscal fund targeting one or two major national innovation challenges, for example mobility and green economy. Para-fiscal funds are already used in Colombia to earmark certain government revenues to provide services and financing to specific programmes, including research and technology transfer in agriculture. If the country chooses this path, it should also address some of the weaknesses of this mechanism, such as the risk of capture by

established beneficiaries. An option would be to set up a tripartite management committee, with representatives from relevant government agencies, the private sector and the research community, to ensure a more effective and forward-looking use of these funds.

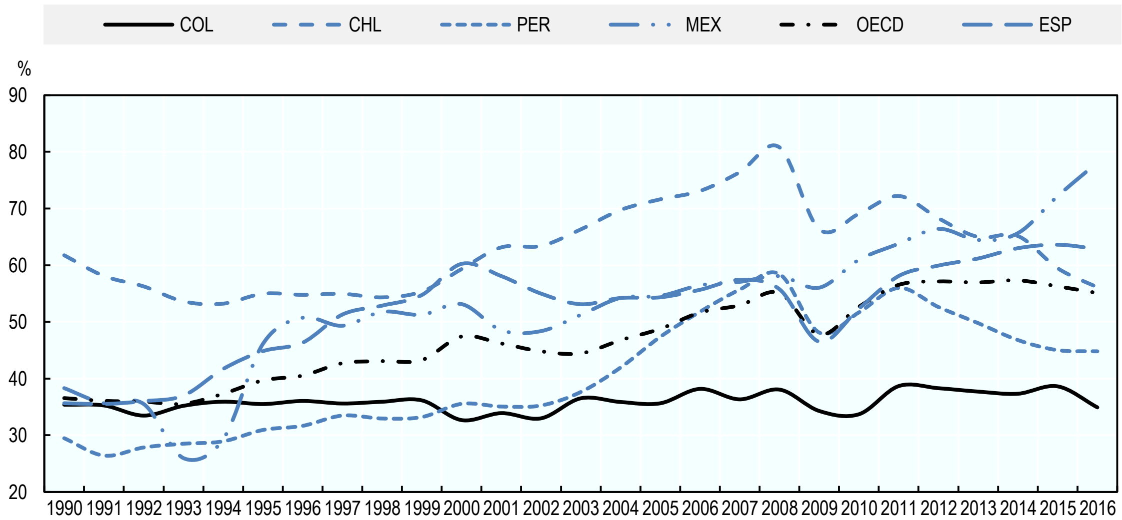
- Consolidating support for start-ups and creating mechanisms to link them to local ecosystems. Colombia has advanced in start-up promotion since 2012, when iNNpulsa was established, by the Ministry of Trade, Industry and Tourism, as an agency in charge of entrepreneurship. The country has updated its policy mix in line with international practices and now offers integrated support for start-uppers, matching financing with mentoring and access to services. It has also improved the legal framework for start-ups. It has revised the 114 procedures linked to setting up and managing a business by eliminating 5, simplifying 56, and digitalising 43. It passed a law in 2017 to regulate university spin-offs to facilitate technology transfer and then a decree in 2018 to regulate crowdfunding. Colombia would benefit from continuing to simplify the legal framework for doing business. The country could consider learning from the piloting of the one-stop shop that the city of Bogotá has implemented to facilitate access to information and government support for new businesses. Colombia would also benefit from defining targeted mechanisms to connect start-ups with the industrial ecosystems of the country. This could be done also through partnerships with large firms and research centres across the whole territory.
- Capacity building in lagging regions and territories. Colombia suffers from high heterogeneity in regional development and public policy capacities in regions and departments. Colombia could call on the capabilities of lead areas, such as Bogotá, Medellin, and Cali, to set up mechanisms for knowledge sharing with lagging regions and departments.

Activating mechanisms to benefit more from trade and investment

Since the 1990s, exports have tripled in volume, but trade as a percentage of GDP in Colombia has remained stable at 36%. This can be partly explained by the size of the economy and by a growing reliance on the domestic market with an increasing population and middle class. This figure is significantly below the OECD average of 55%, and differs from other countries in the region which show a more dynamic trade integration (Figure 0.12).

Figure 0.12. Trade over GDP remained stable and relatively low since the 1990s in Colombia

Trade as share of GDP, Colombia and selected countries, 1990-2016



Source: Authors' elaboration based on World Bank data, 2018,. https://data.worldbank.org/.

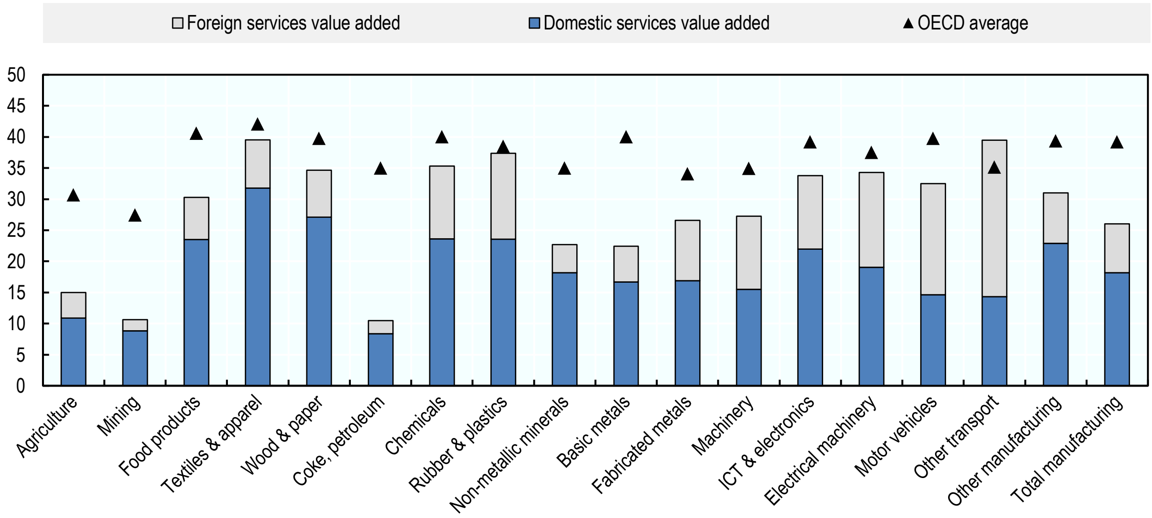
StatLink https://doi.org/10.1787/888933910376

Colombia needs to activate mechanisms to benefit more from trade and investment. To do so the country could:

- Advance in achieving export diversification. As a way to decrease the dependency on natural resources, and especially oil, Colombia could look at deepening and benefiting more from regional integration and also pointing to improving its participation in global value chains (GVCs). Colombia's participation to GVCs is limited. The foreign value added content of domestic exports is among the lowest in Latin America: 9% for Colombia in 2014, compared to 20% for Chile, 13% for Peru and 12.5% for Argentina in the same year. This is explained by its export specialisation in natural resources, and also by the limited development of its domestic industrial base. Colombia could improve its participation in GVCs through services. In Colombia, the value added of services in gross domestic exports is 32% (according to the TiVA-Trade in Value Added- estimates for 2014), while the OECD average is 55%. This gap is particularly evident in mining, oil and coal, indicating the lack of sophistication of these activities in the country (Figure 0.13).

Figure 0.13. Colombia could improve its participation to GVCs through services

Share of services content in domestic industrial gross exports, 2014

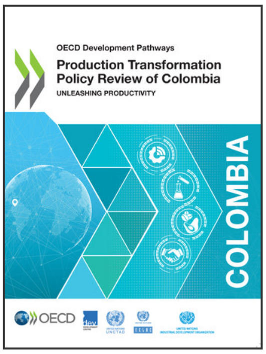


Source: Authors' elaboration on OECD-WTO Trade in Value Added Nowcasting database, 2018 http://www.oecd.org/sdd/its/tiva-nowcast.htm.

StatLink https://doi.org/10.1787/888933910395

- Continue modernising the quality infrastructure to enable domestic firms to operate in an Industry 4.0 and fast-changing industrial landscape. Further progress could be achieved by implementing reforms in the following areas:
  - Making the quality infrastructure system work for innovation. The institutions are still perceived as "regulators" rather than catalysts for innovation. The recognition in 2018 of the INM as a national scientific research institute by Colciencias is a step forward. This reform brings Colombia in line with international practices, and it could help instil a pro-innovation attitude in the institute and enable its participation in public-private research projects. Continuing strengthening the quality infrastructure system a key component of the productivity agenda is a desirable step.
  - Creating a Scientific Advisory Board for INM. This could foster a pro-innovation attitude and facilitate co-ordination between different policies and with the private sector.
  - Supporting digitalisation more fully. The Laboratory for Electrical Magnitudes of the INM is preparing to support digitalisation. However, Colombia lacks laboratories in areas such as acoustics, photometry and radiometry, which are enabling factors for Industry 4.0.

- Increasing strategic co-ordination between industrial development, trade and investment policies. In 2014, the transformation, of the traditional export promotion agency into ProColombia, coupling export promotion and FDI, brought Colombia in line with OECD practices. More needs to be done to benefit from trade and investment. Trade and investment agreements, if properly negotiated, could include provisions to foster learning in domestic firms. While free trade agreements commonly include provisions for technology transfer and technical co-operation, Colombia has not taken advantage of this in its current bilateral agreements. Other countries in the region, such as Chile and Peru, are benefiting from such provisions.



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