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Pandemic, patents and production

On May 5th, 2021, the U.S. government announced its support¹ for an initiative to lift vaccine patents to address the COVID-19 pandemic, reviving a proposal submitted by South Africa and India to the World Trade Organization (WTO) in October 2020² and supported by more than 100 nations. The U.S. statement reignited heated debates about intellectual property mechanisms during a humanitarian emergency, gaining the support of multilateral³ and non-governmental⁴ organizations, and the rejection of some countries and pharmaceutical firms⁵; with the focus of the discussion on whether such measure will have an impact in vaccine production.

A complex web

Modern vaccines are protected by multiple levels of intellectual property, usually licensed to various collaborators. Such protections can cover elements such as DNA sequences, expressions, antigens, platforms or processes, ancillaries, excipients and even methods of administration. The relaxation of these protections tends to be a complex process and the technical requirements for vaccine manufacturing and reliability verification make it difficult to produce "generics" as can be done with some types of conventional drugs.

Within the framework of the WTO⁶ Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), the response to the COVID-19 pandemic would require broad access to an extensive bank of medical products and procedures and other associated technologies. This can be done through the intellectual property system, which would facilitate such transfers through voluntary cooperation mechanisms⁷, such as patent exemptions and exceptions⁸.

¹ [BBC](#). (2021). *Covid US backs waiver on vaccine patents to boost supply*.

² [Reuters](#). (2020). *India and South Africa ask WTO to waive rules to aid COVID drug production*.

³ [WHO](#) (2021). *WHO Director General commends United States decision to support temporary waiver on intellectual property rights for COVID-19 vaccines*.

⁴ [Médecins Sans Frontières](#). (2021). *MSF applauds US leadership on waiving IP for COVID-19 vaccines*.

⁵ [Reuters](#). (2021). *EU sceptical on vaccine waiver, but ready to discuss proposal*.

⁶ [WTO](#). (2020). *The TRIPS Agreement and COVID-19*.

⁷ Such as open access to design documents, non-enforcement of patent rights, free global licenses, technology transfer initiatives, technology *pooling*.

⁸ Such as compulsory licenses, which allow access to a patent without the owner's consent.

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The case in favor and its limits

Arguments in favor⁹ of eliminating patent restrictions point out that these represent a major constraint to global production. They argue that, although some emerging economies have the productive capacity and know-how to scale up their production if they gain access to them, developing countries interested in accessing these technologies may be reluctant to insist on these mechanisms in the face of possible retaliation from countries that maintain patents (such as the United States and members of the European Union), despite the fact that international mechanisms for patent distribution, such as TRIPS, are currently in place.

A lifting of patents could have a non-trivial impact on incentives for future research, both for new variants of COVID-19 and for other diseases. Alternatively, there could be the use of compulsory licenses, which recognize the right to remuneration for inherently risky investments; however, such schemes should be part of a coordinated approach to address the production capacity and pricing mechanism¹⁰.

Dealing with the binding constraint

In **Ecoanalítica** we consider that, beyond an extended discussion on the use of intellectual property in times of emergency on a global scale, such as the case of the COVID-19 pandemic, patents do not represent the *binding constraint*¹¹ to produce vaccines on a large scale. The firms that created the vaccines are trying to increase production and have entered into licensing agreements¹². Voluntary waivers of patent rights, as in the case of Moderna¹³, have not translated into the creation, or even announcement, of production lines of copies of that design. In essence, the availability of vaccines is due to technically and logistically complex processes that are difficult to consolidate for many developing countries, even if there were no legal frictions.

A link in a long chain

Intellectual property rights correspond to securing the knowledge generated, and used, in the development phase of new vaccines. Covering such things as exclusivity over their investment, design, composition, manufacturing process and commercialization. These

⁹ Project Syndicate. (2021). *Share the intellectual Property on COVID-19*.

¹⁰ Project Syndicate. (2021). *Vaccine Licensing, Production and Global Distribution*.

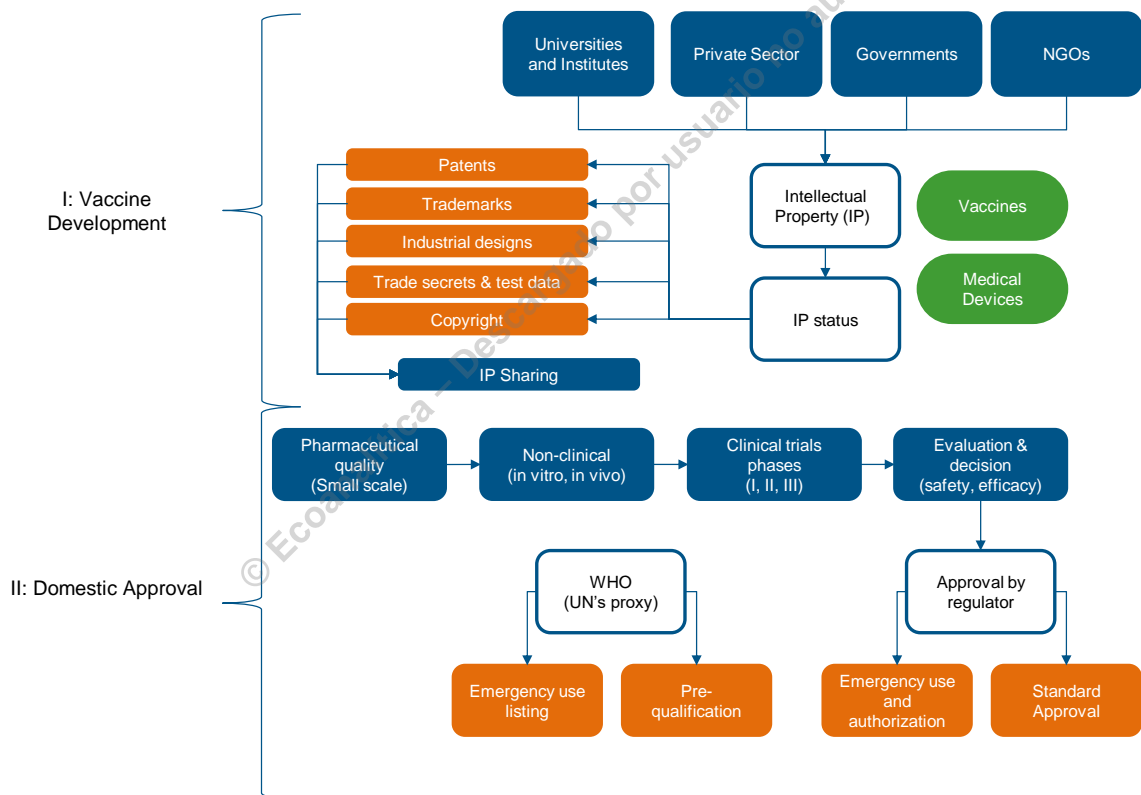
¹¹ Refers to the constraint that, if not lifted, does not allow progress in optimization processes, despite the solution of other constraints.

¹² AstraZenca licensed its vaccine to 15 countries and 25 sites, including India, Brazil, Mexico, Argentina, China and South Africa, Johnson & Johnson licensed its vaccine to multiple firms in the U.S., Spain and France, while Novavax has licensed its vaccine to South Korea, India and Japan.

¹³ Reuters. (2020). *Moderna will not enforce COVID-19 vaccine patents during pandemic*.

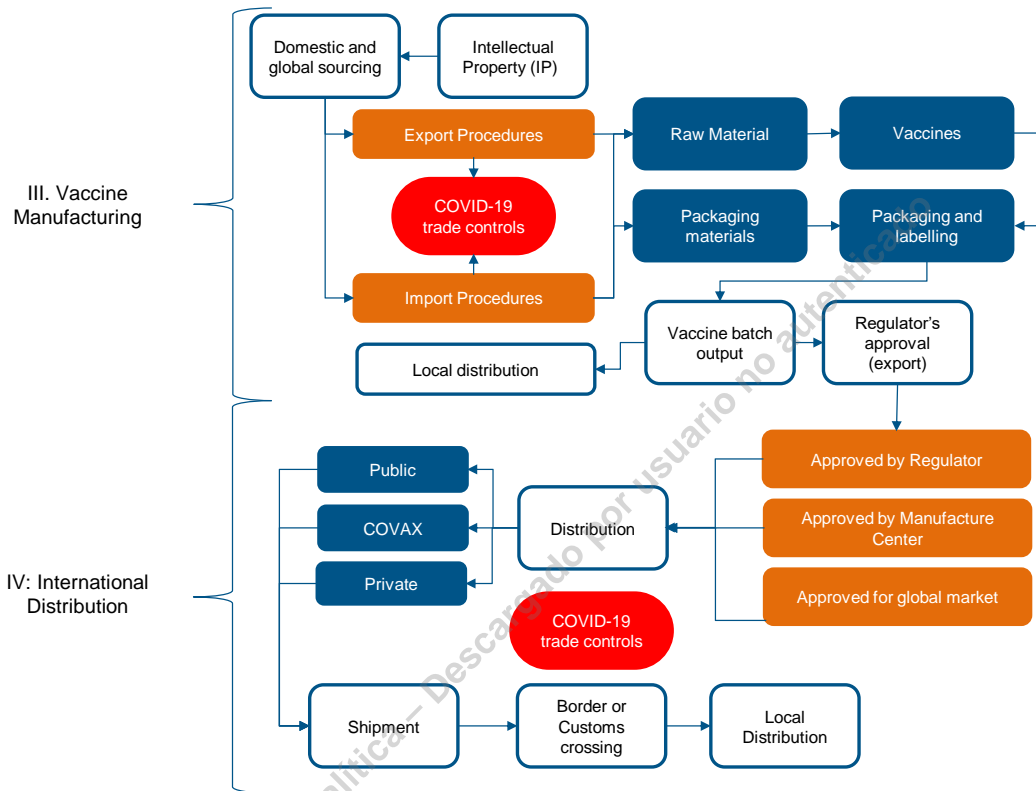
candidate vaccines must then undergo a process of evaluation, approval and certification before they can be produced on a large scale.

In the manufacturing phase, intellectual property is used by domestic and foreign chains to procure the inputs needed to assemble the vaccines that will be distributed locally and internationally in accordance with trade regulations. It is at this stage of the production and distribution process that there is the greatest amount of friction for the availability of vaccines on a large scale.



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Sources: WTO and Ecoanalítica.

Bottlenecks

Within the vaccine production and distribution process, the main constraints to meet the demand for vaccines¹⁴ are technical and logistical, rather than legal, in nature. For practical purposes, we are talking about a chain of hundreds of highly sophisticated steps where thousands of checks are performed to ensure quality and adequate competence for manufacturing.

¹⁴ It effectively corresponds to vaccinating the entire human race or more than 7 billion people.

In principle, there are the specific inputs required to produce vaccines, such as cell culture tanks, filtration equipment for mRNA¹⁵ and adenovirus¹⁶ vaccines, specialized equipment and enzymes and lipids for the mixing and formation of nanoparticles of these vaccines. In addition, these processes require complementary inputs such as bioreactor bags and filtration membranes.

The "emptying and finishing" processes are added to the production ingredients to fill the vaccine vials and package them for distribution. This requires parallel production lines for preservation and administration¹⁷.

All these steps require not only large investments in physical plant, but also in specialized personnel that are not in abundance, which means that the technology transfer processes are lagging because they are industrial methods for which training is not a quick process and trainers are not readily available.

Beyond COVID-19 vaccines, in general, the pharmaceutical manufacturing process is one of high economic complexity¹⁸ that requires great technological sophistication and know-how, whose production is concentrated in a few countries. By 2019, 96.2% of total human vaccine¹⁹ exports²⁰ came from 13 countries, of which 10 are in Europe.

¹⁵ Messenger RNA or ribonucleic acid that transfers the genetic code from the cell nucleus to a ribosome, acting as a template for protein synthesis. This is the method of the Pfizer and Moderna vaccines.

¹⁶ Viral vector, used in AstraZeneca and Johnson & Johnson vaccines.

¹⁷ As syringes.

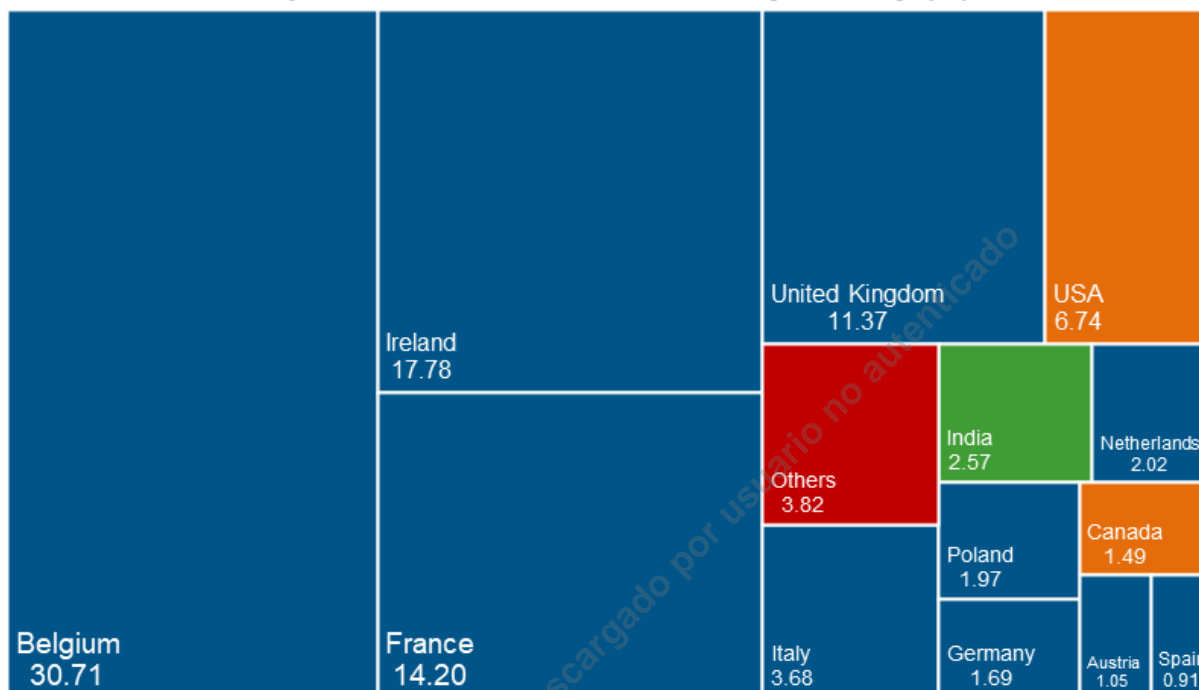
¹⁸ The *Atlas of Economic Complexity* ranks serums and vaccines (HS4: 3002) 129th out of 1,224 highest complexity (89.5th percentile).

¹⁹ HS6 Code: 300220.

²⁰ Quantified at USD 28.9 billion.

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Exports of vaccines for humans by country (%)



Sources: UN Comtrade and Ecoanalítica.

This concentration of production is compounded by frictions in the supply chains. In addition to the obvious pressure of demand on absolute availability, there are restrictions in the marketing and international movement of inputs and vaccines themselves.

As of May 4th, 2021, 98 countries have placed barriers on exports²¹ explicitly related to COVID-19, both medical supplies and other products. Of particular note are the restrictions, controls or bans on the export of vaccines or their production and administration materials in the United States²², the European Union²³ and India²⁴. In the case of the latter, these restrictions or bans resulted in a delay in the supply programmed for COVAX.

²¹ By the same date, 103 countries had released COVID-19-related imports.

²² It went into effect on January 21st, 2021 with no official lifting date. Although on May 17th, the Biden administration announced that it authorized the shipment of 20 million vaccines approved for use in the United States (plus 60 million doses from AstraZeneca) to other countries.

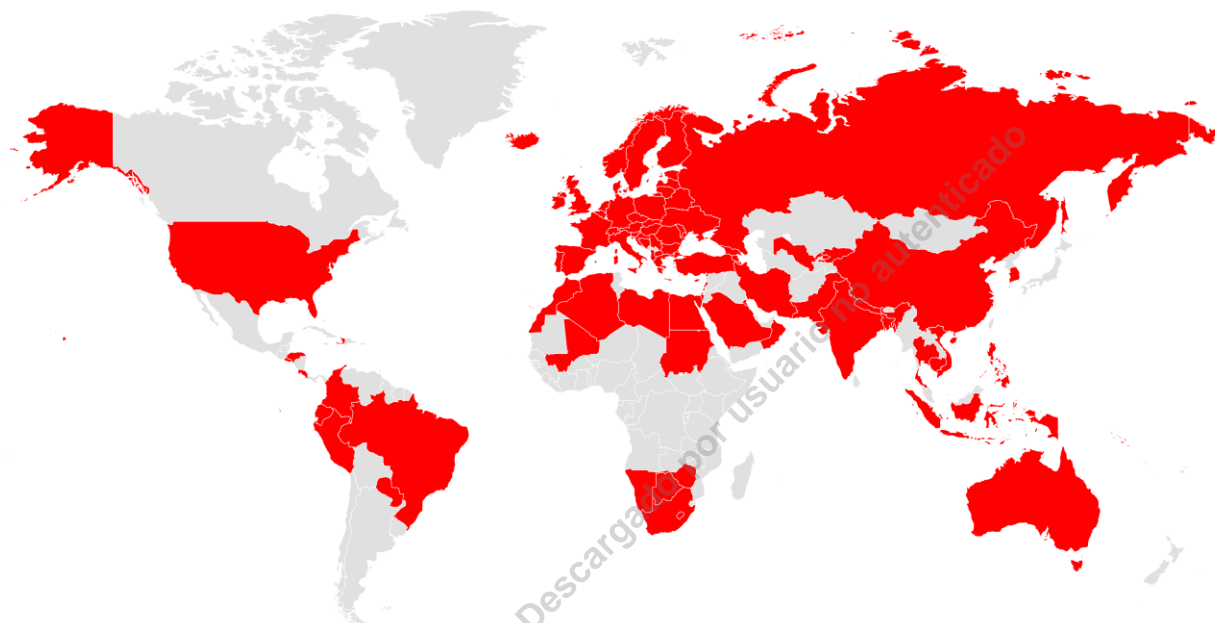
²³ It became effective on January 29th, 2021 and was extended until June 30th.

²⁴ Restrictions implemented in March 2021 evolved into an export ban in April to address domestic cases.

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COVID-19 related export restrictions



Note: Affected products include personal protection equipment (masks, gloves), pharma products, food, among others.
Sources: ITC Markey Access and Ecoanalítica.

This set of works triggers a butterfly effect at various points in the production chain. For example, to produce its vaccine, Novavax²⁵ requires a special saponin complex²⁶ that is produced at sites that may be remote from the antigen production centers, which, in turn, are also at sites other than the final assembly plants. To comply with the production license agreement in India²⁷, India requires, among other things, bag bioreactors for cell culture that are subject to export restriction in the United States. Should production be completed, it cannot be delivered to the COVAX facility²⁸ if the export bans on vaccines in India remain in place²⁹.

²⁵ With plans to set up production centers for antigens, extracts, assembly and distribution in 9 countries to produce 2 billion vaccines.

²⁶ A Chilean tree bark extract with limits of availability.

²⁷ Through the Serum Institute of India.

²⁸ Reuters. (2021). *Novavax to start shipping COVID-19 vaccines to COVAX program in third quarter*.

²⁹ Endpoint. (2021). *As fears mount over J&J and AstraZeneca, Novavax enters a shaky spotlight*.

The economic case for increasing capacity

Castillo & et al (2021)³⁰ estimated that the overall benefit of a current installed capacity³¹ to produce, distribute and supply 3 billion per year of regulator-approved vaccines amounts to USD 17.4 billion, and the additional benefits of such a capacity to fully vaccinate 1 billion individuals could be between USD 576 billion and USD 989 billion, depending on when it enters service. This would mean that it could be four months earlier to reach general immunization.

Global Value of Annual Vaccine Production Capacity

Global Capacity (Billion vaccines)	Global Benefit (Trillion USD)		Time to 70% vaccination (months)	
	GDP alone	Comprehensive	High income countries	World
1	5.3	10.5	31.5	66.0
2	7.5	15.0	16.5	33.7
3	8.7	17.4	11.5	23.0
4	9.4	18.8	9.0	17.6
5	9.8	19.7	7.5	14.4

Note: 3 billion annual vaccines are assumed as the baseline scenario, with half of the capacity coming into operation in January 2021 and the other half in April 2021.

Comprehensive earnings cover health and education benefits.

Source: Castillo & et al (2021) and Ecoanalítica.

The global benefits of investing USD 1 billion per year to accelerate the speed of production and vaccination (between USD 576 and USD 989 per person) compared to current vaccine costs (between USD 6 and USD 40) shows a large gap between commercial and social incentives with respect to productive capacity, which can be financed by governments and international organizations.

³⁰ Castillo, J. C., Ahuja, A., Athey, S., Baker, A., Budish, E., Chipty, T., Glennerster, R., Kominers, S. D., Kremer, M., Larson, G., Lee, J., Prendergast, C. Snyder, C. M., Tabarrok, A., Tan, B. J. & Więcek, W. (2021). Market design to accelerate COVID-19 vaccine supply. *Science*, 371(6534), 1107-1109.

³¹ Capacity unit is defined as the fixed investment needed for one year for a complete individual vaccination, including production lines as complementary investments to deliver the doses to the person.

In general, the authors suggest increasing installed capacity in two ways: relying on market mechanisms and using current capacity more efficiently. The first implies favoring contracts that include the increase of installed capacity and not only the delivery of a defined number of doses, relaxing restrictions in the production chain (mainly supplies) and relying on tenders to distribute the load. The second can generate changes in the dose supply regime³², encourage testing against new variants, promote the use of less efficient vaccines and greater international exchange of vaccines according to the needs of each country.

Conclusions

At **Ecoanalítica**, we believe that patent liberalization will have little impact on the availability of vaccines in the short and medium term. For developing regions with vaccine shortages and limited productive capacity, such as Latin America, this type of measure will not change pre-existing trends in vaccination rates. Specifically, government authorities, firms and households should keep in mind that:

- Restrictions of a technical or logistical nature will not disappear with the lifting of intellectual property protections alone. However, it could provide an incentive for third party investments that would not previously have been added to existing production efforts.
- If the third-party initiatives were to materialize, it would increase the demand for inputs that are already in limited supply.
- Expansion of installed capacity requires major investments and training that are unlikely to be easily accessible to independent initiatives, much less without the support of established vaccine manufacturers.
- Intellectual property negotiations can take up time and political capital with few tangible results in the short term.
- The final agreements at the WTO, if concluded, may have a much more limited scope than that indicated in the first political declarations.
- The international cooperation approach is more efficient if it focuses on expanding productive capacity and lifting marketing restrictions to free up bottlenecks in supply chains.

³² For example, schemes to prolong vaccination capacity by delaying the administration of two doses for a period, using a lower dose regimen, or giving a single dose to those previously infected with the coronavirus, have a similar effect in terms of the provision of vaccines compared to increasing capacity through direct mechanisms.

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In the end, imbalances in the provision of vaccines are caused by one of the most elementary relationships in the economy: demand far exceeds supply. Only, in this case, the adjustment variable is not the price of the good demanded, but the time to access it.

Giorgio Cunto
Diego Santana Fombona

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WEEKLY INDICATORS

Weekly Economic Indicators			
	3rd Week May	Weekly chg. (%)	Depre/Apre (pp) ¹
FX Boards (VES/USD) ²	2,949,314.18	4.0	3.8
	1st Week May	Weekly chg. (pp)	Annual chg. (pp)
Lending Interest Rate (%)	59.4	3.4	19.7
	3rd Week May	Weekly chg. (pp)	Annual chg. (pp)
Overnight Interest Rate (%)	411.1	143.5	308.4
	2nd Week May	Weekly chg. (%)	Annual chg. (%)
International Reserves (USD Bn)	6,313.0	0.3	-1.8
	1st Week May	Weekly chg. (%)	Annual chg. (%)
Monetary Liquidity (MM VES)	1,317,188,338.37	3.7	1,201.7
Price of International Oil Baskets (USD/bl)			
	1st Week May	Weekly chg. (%)	Annual chg. (%)
WTI	65.1	2.6	145.0
Brent	69.0	3.0	152.8
Price of the Venezuelan oil basket (USD/bl)			
	5th Week July	Weekly chg. (%)	Annual chg. (%)
Weekly Average	22.4	0.0	-61.9
Annual Average	28.8	-0.7	-51.7

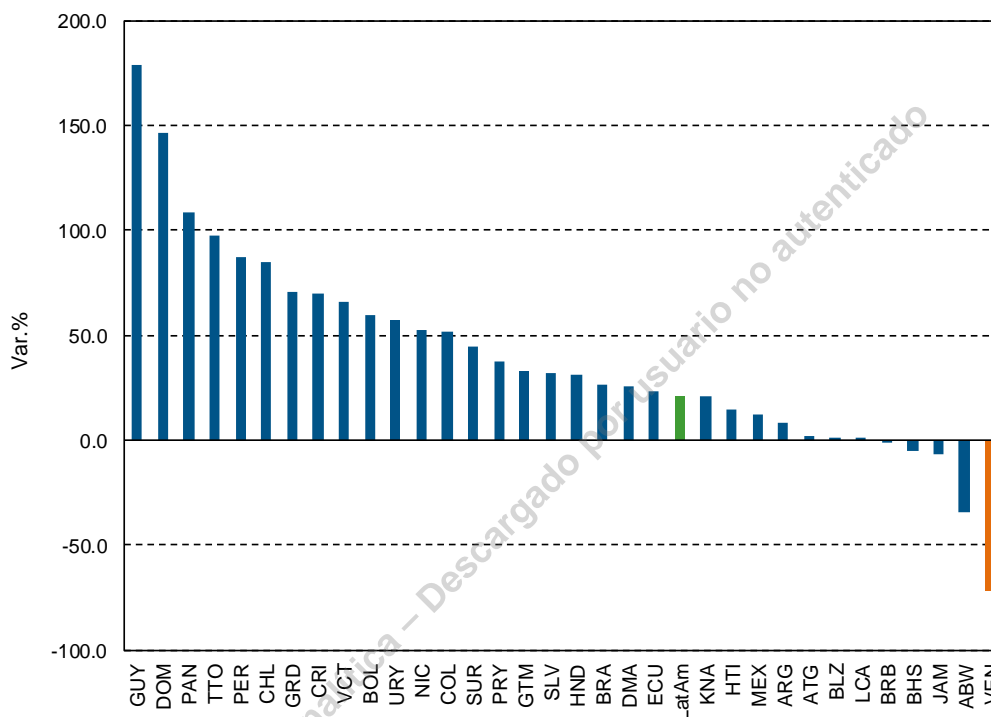
Sources: BCV, MENPET, ONT and Ecoanalítica

* Annual variation of accumulated expenditure.

¹ Depreciation (+)/Appreciation (-)² FX Borads' average exchange rate

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CHART OF THE WEEK: "25 YEARS OF PERFORMANCE".
Real GDP per capita growth (1995-2020)


Note: Calculations made relative to 1994's end.
 Sources: International Monetary Fund and Ecoanalítica.

The COVID-19 pandemic has caused one of the most profound disruptions in the world economy in recent history, especially in emerging economies such as those of Latin America. However, for most countries in the region, the pandemic has meant a momentary interruption of the growth path they had been on in recent decades.

The result of this growth path can be seen in the evolution of GDP per capita, or output per capita, over the last generation. In some countries, generally small in terms of population and size of the economy, there had been significant growth. This is the case of those that led the region: Guyana (GUY) and the Dominican Republic (DOM) with 179.4% and 146.3% at the end of 2020 and with respect to 1995, respectively. On the other hand, the variations in countries such as Peru (PER) and Chile (CHL) could reflect their governments' efforts to exercise good economic policies to maintain relatively stable per capita growth over time. The corresponding figures are 87.3% for Peru and 85.0% for Chile.

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Among the largest economies in Latin America, Colombia (COL) had a per capita GDP growth of 52.1%, while Brazil's (BRA) was 26.7% and Mexico's (MEX) was 12.6%. Although most of the regional economies achieved a positive cumulative variation over the last 25 years, 5 islands had negative results. Among them, Aruba (ABW) stands out with a contraction of its real GDP per capita of 34.5%. However, the worst result was that of Venezuela (VEN) with a negative variation of 71.2%. In its case, much of this decline is attributed to the last eight years of recession that the country has gone through. Considering the wide range between countries, the region as a whole had a per capita GDP growth of around 21.1%.

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ECONOMIC TIPS

COVID-19 in Venezuela. According to governmental numbers as of May 18th, the country accumulated 218,814 registered cases of coronavirus and 2,446 deaths. As of May 19th, it is estimated that 1.1% of the population has received at least one dose of some vaccine.

Confined against the pandemic. The week of May 16th to May 23rd was managed under a scheme of radicalization of the containment measures, in accordance with the "7+7" scheme with which the national authorities have responded to the pandemic. During this week, the containment measures were implemented and all sectors of the economy maintained their activity under the pertinent biosecurity norms.

Inflated (I). The Central Bank of Venezuela published the inflation corresponding to April which was 24.6% on a month to month basis. Furthermore, according to BCV figures, prices have increased 183.8% since December and 2,940.8% since April of last year.

Inflated (II). In addition, the April family food basket recorded by the Center for Documentation and Social Analysis of the Venezuelan Federation of Teachers (Cendas) was valued at VES 803,372,610, or USD 292.5 at the official exchange rate at the end of the month, which is equivalent to an increase of 31.1% with respect to March.

Inflated (III). According to Cendas, a minimum of 446.31 minimum monthly salaries are required to acquire the basic food basket, which is equivalent to 14.9 minimum daily salaries.

Private loans (I). According to the portal Banca y Negocios, private banks concentrated 76.7% of the loans of the banking system in April. Of the VES 726,032,846,580 thousand granted in loans, VES 553,303,383,881 thousand were granted by private banks and VES 173,002,462,699 thousand by public banks; the latter is equivalent to 23.3%.

Private sector loans (II). In addition, the credit portfolio increased VES 179,257,614,583 thousand, or 25.8%, with respect to last month, while inter-monthly inflation published by the BCV was 24.6% for April.

Intervening regularly (I). On May 17th, the BCV intervened in the interbank market by injecting euros at an exchange rate of 3,600,658.2 bolivars per euro, which resulted in the price of the euro in the interbank market decreasing by 1.17% that day.

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Intervening regularly (II). According to economist Leonardo Vera, the BCV obtains the resources to intervene in the exchange market thanks to the fact that it "exports metal scrap" to countries such as Turkey through the Ezequiel Zamora Corporation (Corpoez).

Bonuses and more bonuses (I). The National Executive announced an increase in the amount of the bonuses Hogares de la Patria, Parto Humanizado, Lactancia Materna and José Gregorio Hernández, which began to be delivered as from May 15th.

Vouchers and more vouchers (II). The amount of the Hogares de la patria bonus ranges from VES 1.12 million to VES 4.2 million, depending on the number of family members, while the amount of the Amor Mayor bonus is VES 7 million, the amount of the Chamba Juvenil, Somos Venezuela and University Education Scholarships is VES 2.8.

Bonuses and more bonuses (III). Finally, the amount of the Humanized Childbirth and Elaborating Mothers and Fathers bonuses of the Feeding Houses, Mamá Rosa dining halls and Nutritional Recovery Centers was set at VES 7 million.

Liquid? Liquidity was VES 1,317,188,338.367 million for the week of April 28, a variation of 3.7% in nominal terms with respect to the previous week and of 1,201.7% with respect to last year.

OIL TIPS

As it recovers (I). Oil prices rose more than 1% this Monday, May 17th, as the reopening of the European economy and increased U.S. demand helped offset the earlier price decline due to a rise in COVID-19 cases in Asia and weak industry data from China.

As it recovers (II). Brent ended the session up 1.1% at USD 69.5 per barrel and *West Texas Intermediate* (WTI) crude rose 1.4% to USD 66.27 per barrel.

Humanitarian aid? (I). A proposal is circulating to earmark Venezuelan oil revenues for humanitarian aid. This political initiative shared by Venezuela and the United States describes the "citizens' initiative" to channel part of the revenues from oil sales into an escrow account to pay for humanitarian programs coordinated by the UN.

Humanitarian aid? (II). The four-page letter signed by the former Venezuelan legislator and Senior Coordinator of the Boston Group was sent to President Nicolás Maduro, opposition political parties, the UN office in Caracas, among others. The mechanism could generate USD 50 MM per month from a fixed volume of crude oil sold by PDVSA.

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Support without sanctions (I). The U.S. government is likely to renew waivers of sanctions on Venezuela for Chevron and four oil companies as the White House reviews its broader policy toward Caracas.

Support without sanctions (II). These waivers allowed Chevron, Schlumberger, Halliburton, Baker Hughes and Weatherford to continue operating in Venezuela after the previous U.S. administration imposed oil sanctions on the OPEC country in January 2019.

New Chinese tax... A Chinese tax revision threatens to orphan up to 400 kb/d of Venezuelan crude that has been a lifeline for Caracas since the U.S. imposed oil sanctions in 2019.

... hindering exports. The new Chinese tax on imports of diluted bitumen would aggravate the already battered financial situation of PDVSA, which has been forced to grant large discounts on its crude oil sales and be left with a reduced portfolio of clients due to international sanctions on its exports and the quality problems of its crude oil.

New conditions. U.S. oil company Exxon Mobil Corp laid off 650 workers represented by the United Steelworkers (USW) union and proposed wage and contract conditions for workers who manufacture Mobil 1 gasoline and motor oil at its Beaumont, Texas, facility.

After the storm... The shutdown of Colonial Pipeline last week, by the most disruptive cyberattack on record, prevented millions of barrels of gasoline, diesel and jet fuel from reaching the East Coast of the Gulf Coast.

... calm is coming? The pipeline system reported Tuesday, May 18th, that its system was back online after a network outage earlier in the day while it was restoring service.

It is late... The oil market is convinced that there will be a coming recovery in demand, based on the view that the world is recovering from the COVID-19 pandemic and economies are rebounding.

... but it is coming. While this may be true for North America and Europe, the Asian region, the main oil consumer, is a little less optimistic, as demand for crude oil from its main importers, China and India, presents a mixed picture.

Until further notice. Dayalitzza Aray, deputy to the 2015 National Assembly, stated that the El Palito refinery, in the municipality of Puerto Cabello in Carabobo state, could remain paralyzed until July, for which she warned that it is likely that the queues at service stations will increase.

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SECTORIAL TIPS

Digital revolution (I). The president of the Superintendency of Banking Sector Institutions (Sudeban), Antonio Morales, assured that, at present, the C2P system for the collection of payments from businesses to individuals is a priority among the projects that promote the digitalization of 100% of the country's financial operations.

Digital revolution (II). *"All you have to do is indicate your telephone number, the bank you are affiliated with and your identity card and immediately the merchant orders the payment to the bank and a pin is sent to your cell phone with a text message authorizing the debit of the customer's account"*, which will speed up the entire payment process.

State entertainment. According to Fran Monroy, a journalist specialized in information technology, the national government has a project for a free satellite television service with 43 channels and some radio stations. *"There is talk that the scope of the project would be that in one year they will have distributed as many antennas and decoders as Simple TV has at the moment"*.

Optimism... Saúl López, president of the Venezuelan Society of Agronomists and Related Engineers (SVIAA), assured that only large agricultural producers have access to fuel, since they are financed with their own resources. According to López, *"it is not such an apocalyptic scenario and it is not so favorable either, but almost all large producers have a lot of diesel in storage"*.

... unsustainable in reality. Lopez states that producers currently need approximately 45 million liters of fuel, which translates into 2,200 barrels per day and 128,000 tons of fertilizer, of which only 50% is available.

A growing sector. The president of the Chamber of the Pharmaceutical Industry (Cifar), Tito Lopez, reported that the pharmaceutical sector closed 2020 with a slight recovery of 19%, compared to 2019, as a consequence of the COVID-19 pandemic.

They are still waiting. Ricardo Cusanno, president of Fedecámaras, assured that they are still waiting for a response from the Government regarding the national vaccination plan they presented two months ago. According to Cusanno, *"It is false that the technical proposal of Fedecámaras, which will have an investment of 108 million dollars, has been rejected"*.

Less than a third of what it was. The national coordinator of Producers and Entrepreneurs of Un Nuevo Tiempo, Fernando Camino Peñalver, informed that the national fishing production has fallen 70.0% in the last twelve years and added that the production deficit is approximately 200,000 tons.

Gradual extinction (I). According to the Executive President of the Venezuelan Association of Film Exhibitors, Abdel Güerere, only 47% of movie theaters operate under the 7+7 scheme. In 2020 there was an 87% plunge in attendance compared to 2019.

Gradual extinction (II). According to Güerere, audience attendance at movie theaters has been gradually decreasing for several years. At the end of 2019, 11.7 million moviegoers attended theaters, while in 2015, there were almost 29 million attendees, representing a 59.7% contraction between 2015 and 2019.

Bankruptcy in sight. Roberto Latini, general director of the Venezuelan Confederation of Agricultural Producers (Fedeagro), warned that, if the fuel supply situation is not resolved, they will face the winter cycle with huge accumulated losses and no harvest; therefore, the national agricultural activity is at risk of disappearing due to the bankruptcy of the producers.

Lack of cash. The Secretary of Transportation of the Governor's Office of Miranda, Francisco Garcés, informed that currently 1,340 units have digital fare payment in the Altos Mirandinos, the municipalities of Sucre and Baruta, Guarenas, Guatire and part of Greater Caracas. He stated that the units of the Valles del Tuy and the Barlovento area will also be equipped with this payment system by the end of May.

Modern alternatives. Representatives of Fedecámaras Zulia presented to directors of the Maracaibo Chamber of Commerce, the Zulia Chamber of Construction and the Zulia Hotel Chamber, among others, the "Bitcoin City" project, with the objective of incorporating crypto-assets as a form of payment in the process of buying and selling goods and services.

Reinventing itself. The Puerto Cabello Chamber of Commerce estimates that, since the beginning of the measures taken by the national government to curb the COVID-19, about 20.0% of the businesses have migrated to other items to justify the opening of the premises.

INTERNATIONAL TIPS

COVID-19 in the world. The World Health Organization (WHO) indicated that, as of May 20th, the number of COVID-19 cases worldwide reached 164,523,894 and the number of deaths was 3,412,032. By May 18th, 1,407,945,776 doses of vaccine against the disease have been administered worldwide.

Fed Failures. Following the release of the year-over-year change in the U.S. national price index for April 2021, which came in at 4.2%, the Federal Reserve (Fed) is under question as that figure represents the highest year-over-year inflation since 2008.

A "population" concern (I). The latest population census report issued by the Chinese government for 2020 indicates a fertility rate of 1.3 children per woman and the smallest population growth rate in the last decade (0.39%). Thus, the report suggests a relaxation of the birth rate policies adopted since the 1970s.

A "population" concern (II). The People's Bank of China (PBOC) has recently expressed concern about the aging population in relation to the government's financial capacity as the labor force steadily contracts. As such, the PBOC has called for the release of policies to increase the birth rate.

Done deal (I). The U.S. government and the European Union (EU) agreed to refrain from increasing tariffs that triggered a dispute between the allies in 2018, when President Donald Trump imposed tariffs on metals imported from Europe, Asia and others due to national security risks.

Deal (II). Although the EU had planned to increase its tariffs on products from the U.S. by approximately 50.0% in June 2020, the announcement published on May 17th suggested that future negotiations on the iron ore industry and production overcapacity could take place, although the next steps with respect to existing tariffs were not specified.

Solvency problems (I). According to the consultancy firm PwC, its most recent survey of a sample of 400 UK firms revealed that 55.0% of them foresee potential liquidity problems in the next twelve months.

Solvency problems (II). Approximately the same proportion indicated that they had experienced difficulty in the last year in paying off their debts and 67% of the firms stated that they projected a recovery of their activity to pre-pandemic levels in two years; however, the remaining 23% responded that they had already recovered.

Almost neck and neck (I). The recent simulation of the next presidential elections in Peru showed that the socialist candidate Pedro Castillo would obtain 51.1% of votes in favor, while Keiko Fujimori, the right-wing candidate, would be close with 48.9% of the electorate's support. For this study, a margin of error of 2.8% was considered.

Almost neck and neck (II). Although Pedro Castillo obtained the majority of votes in the first round of the election process, the study does not project a clear victory for this candidate in the second round of these elections, to be held on June 6.

The Bicentennial Plan (I). Last Sunday, Pedro Castillo presented preliminary ideas of his government plan for the first 100 days of his term of office if elected President. His "Bicentennial Plan" would focus the economic project on the nationalization and regulation of monopolies and oligopolies.

The Bicentennial Plan (II). In addition, he proposed the re-evaluation of contracts with foreign mining companies to ensure the retention of 70% of revenues within Peru. Castillo will seek to increase taxes in certain productive sectors, as well as greater controls on imports to encourage local production of clothing and food.

An independently authored constitution (I). Independent candidates for the Chilean Constituent Assembly dominated the elections held on May 16th, while right-wing candidates, supported by President Sebastián Piñera, managed to secure barely one-fifth of the 155 seats available.

A constitution of independent authorship (II). The configuration of the Assembly, where the left and center-left leanings predominate, has given hints about the new articles that will compose the next national Constitution.

POLITICAL TIPS

There will be an electoral party. Pedro Calzadilla, President of the National Electoral Council (CNE), informed that there will be joint elections on November 21 of this year. In these elections, 23 governorships, 335 mayoralties and representatives to the regional legislative councils will be elected.

Very soon... The Venezuelan Electoral Observatory warned that six months is "little time" to organize elections "as complex" as those scheduled for November 21, since "four processes are translated into one".

... for these conditions. Likewise, the organization emphasized that the success of the registration and updating of the Electoral Register, scheduled from June 1 to July 15, will depend on the number and distribution of points that will be set up in a country with known limitations of mobilization, crisis of public services and in times of pandemic.

Giving guarantees? The new rector of the National Electoral Council (CNE), Enrique Márquez, informed that they plan to invite parties, civil society and the international community so that they can see the updating and auditing of the Electoral Registry, "so that the process can be accompanied by enough eyes".

Sputnik Light (I). The Venezuelan Ministry of Health approved last Saturday, May 15th, the use of the Russian vaccine against coronavirus: Sputnik Light, a new variant of Sputnik V that has been previously administered in Venezuela.

Sputnik Light (II). According to the Russian Government, the efficacy of this product is around 80% and only one dose is required to develop immunization against COVID-19. However, to date, no scientific studies from independent firms have been published to corroborate this degree of effectiveness.

Yet another dialogue (I). Juan Guaidó presented the "National Salvation Agreement", a proposal for negotiations between "*legitimate democratic forces, the regime and international powers*", in which he highlights the holding of elections at all levels of government with international observation, in addition to a massive vaccination campaign against COVID-19 in the country.

Yet another dialogue (II). In turn, Guaidó advocated for "*the commitment of the international community to achieve the recovery of Venezuela and offer incentives to the regime, including the progressive lifting of sanctions*", conditioned to the fulfillment of the fundamental objectives of the agreement.

U.S. willing to comply. James Story, U.S. Ambassador to Venezuela, assured that his country will evaluate the sanctions imposed on the Maduro government if a path to free and democratic elections is established in the country, as set forth in the "Framework for Democratic Transition" presented by the State Department last year.

They are open. Congressman Luis Eduardo Martínez stated that the National Assembly is evaluating the proposals presented by Fedecámaras, among which are laws for the construction sector, for entrepreneurship and for the protection of private and foreign investments, the return of 135 expropriated companies and the authorization to acquire vaccines against COVID-19 for the guild.

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Indebted. The rector of the Central University of Venezuela (UCV), Cecilia García Arocha, assured that the Government of Nicolás Maduro owes VES 62 billion of the 2020 budget law. According to the exchange rate of the Central Bank of Venezuela (BCV), such amount is equivalent to USD 20,327.7.

Illegal retention. Last May 14th, a commission made up of officials of the Fourth Court of the Ordinary Municipality and Executor of Measures of the Judicial District of the Metropolitan Area of Caracas went to the headquarters of El Nacional. The officials executed a seizure notice to the newspaper as "compensation to Diosdado Cabello for alleged moral damages".

To be considered. The Association of Venezuelan Journalists Abroad (Apevex) requested, this Saturday, May 15th, the U.S. Treasury Department to include in the list of sanctioned officials who participated in the illegal seizure of the headquarters of El Nacional.

A see you later... Iván Simonovis, appointed commissioner of Security and Intelligence by opposition leader Juan Guaidó, resigned this Monday without clarifying the reasons for his decision.

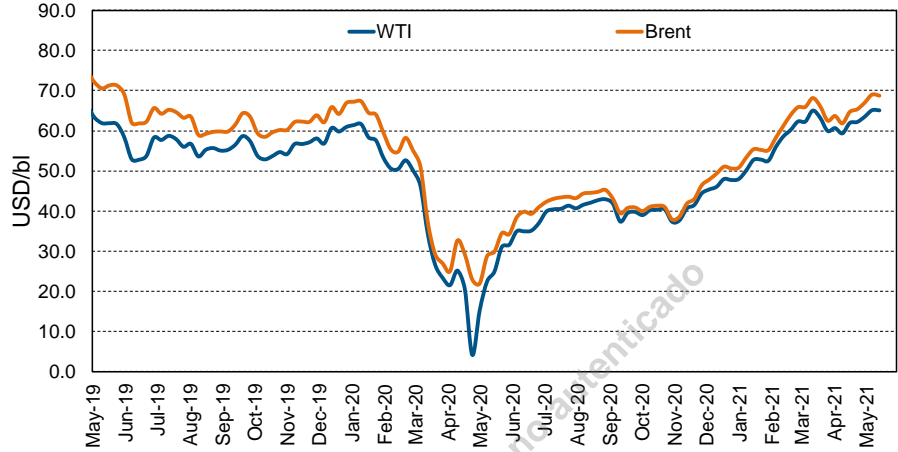
... without explanation. In a letter addressed to Guaidó and disseminated on social networks, Simonovis stressed that it was "not an easy decision" and that he feels satisfied for having fulfilled the "goals established" for his position that led him to develop a close relationship with various investigative agencies.

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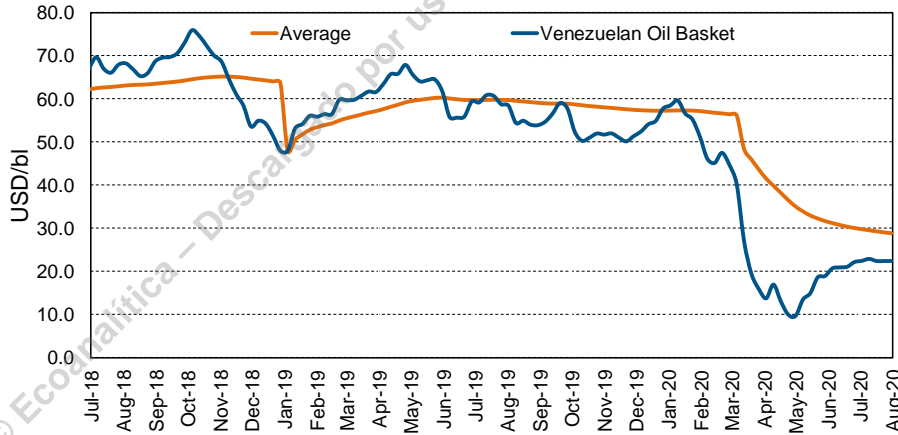
ECONOMIC INDICATORS

**Oil Prices
(WTI and Brent)**



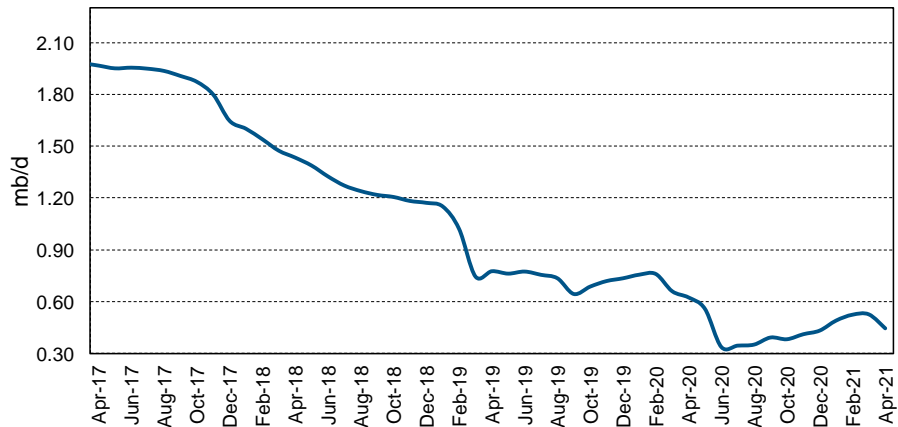
Sources: Menpet and Ecoanalítica

**Oil Price
(Venezuelan Basket)**



Sources: Menpet and Ecoanalítica

**Oil Production
(Secondary sources)**



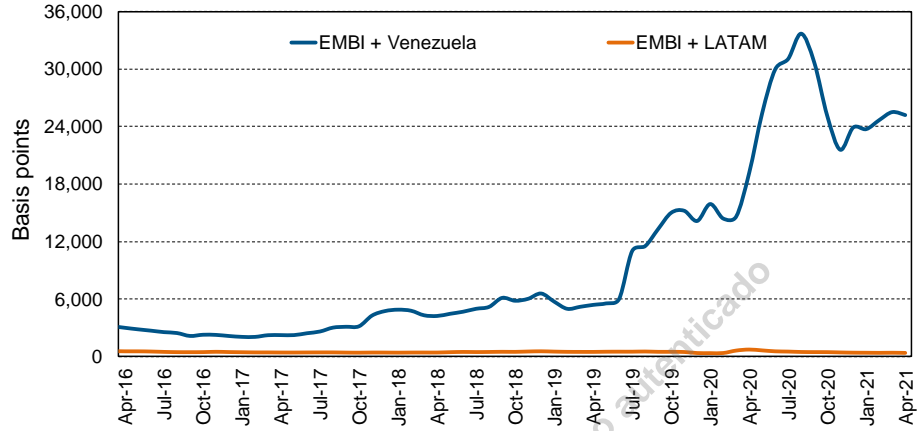
Sources: OPEC and Ecoanalítica

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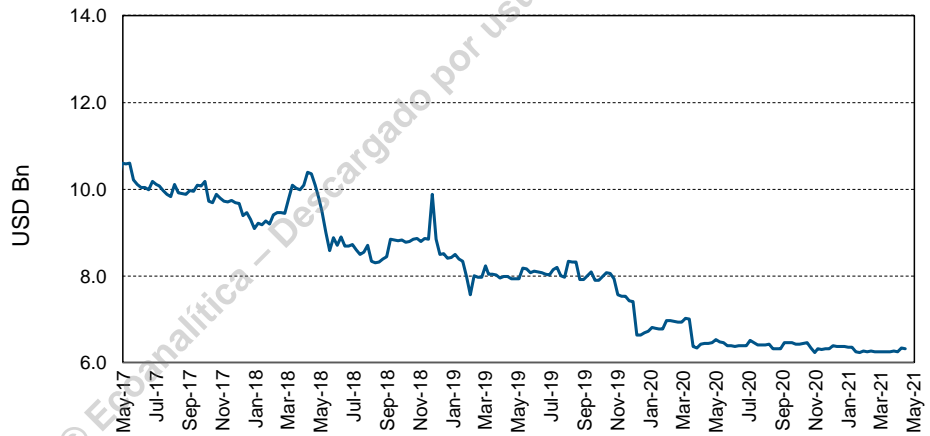
ECONOMIC INDICATORS

EMBI



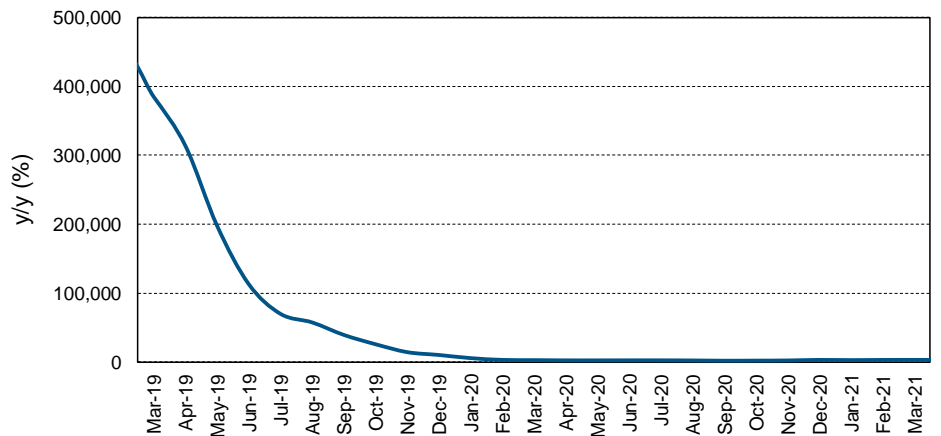
Sources: BCRP and Ecoanalítica

FX Reserves (BCV)



Sources: BCV and Ecoanalítica

Inflation (BCV)



Sources: BCV and Ecoanalítica

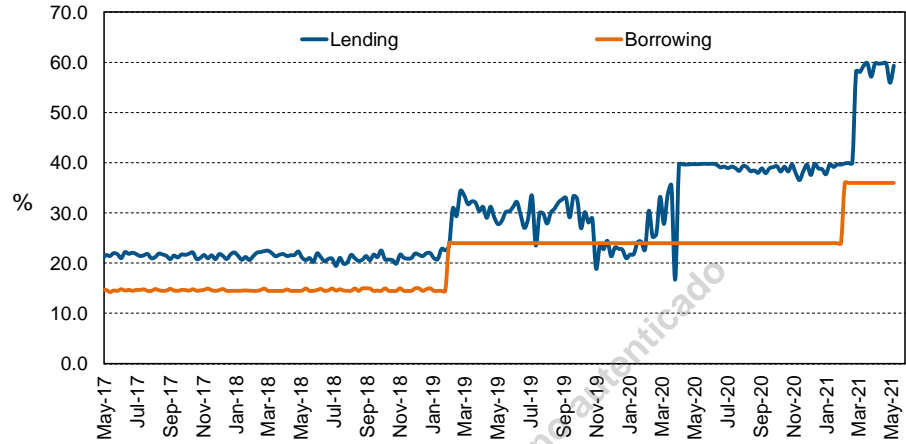
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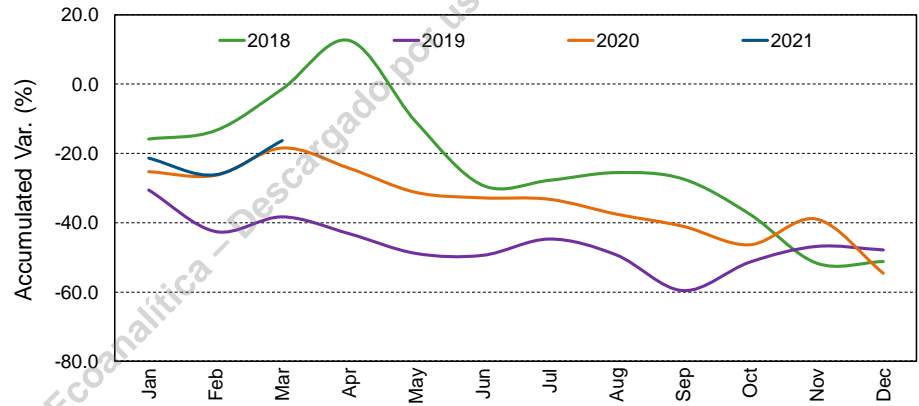
ECONOMIC INDICATORS

**Interest Rate
(Six major banks)**



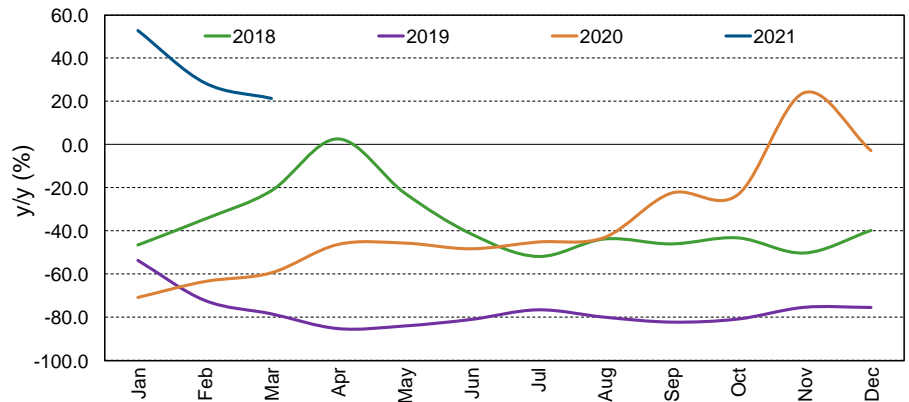
Sources: BCV and Ecoanalítica

**M2 Expansion
(Real)**



Sources: BCV and Ecoanalítica

**Loan Portfolio
(Real)**



Sources: SUDEBAN and Ecoanalítica

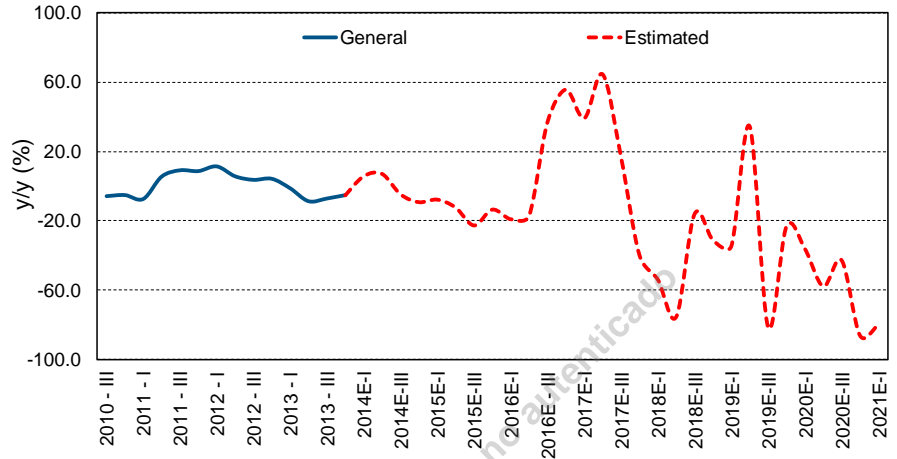
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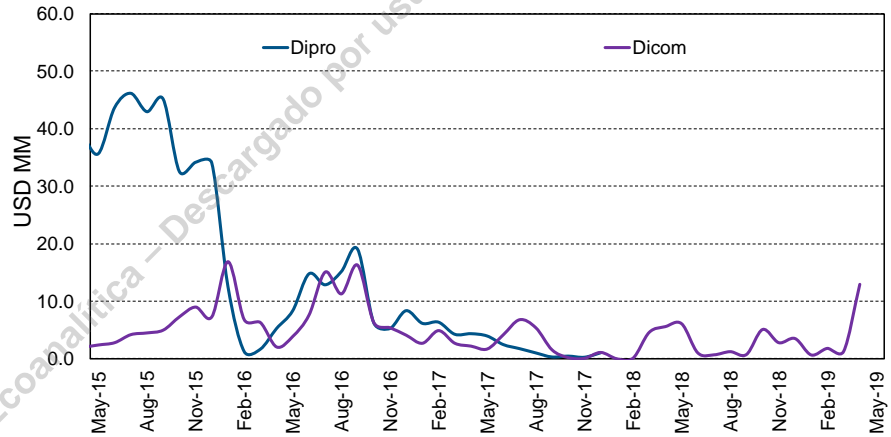
ECONOMIC INDICATORS

Real Wage Index



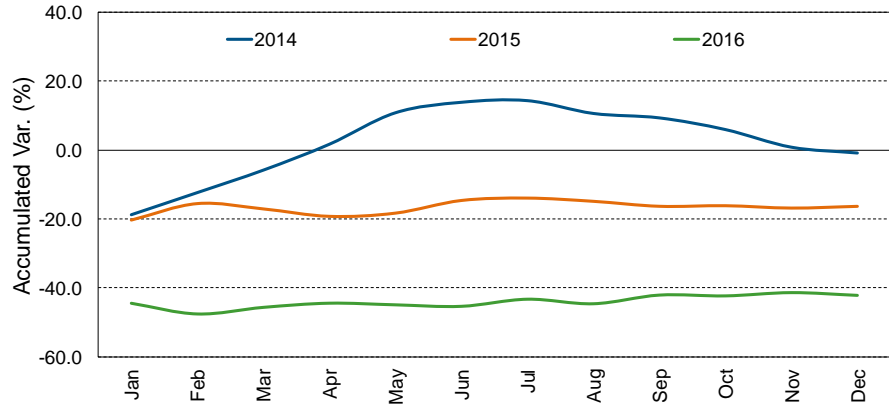
Sources: BCV and Ecoanalítica

Disbursements to the Private Sector (Daily Average)



Source: Ecoanalítica

Primary Spending NTO (Real - Central Government)



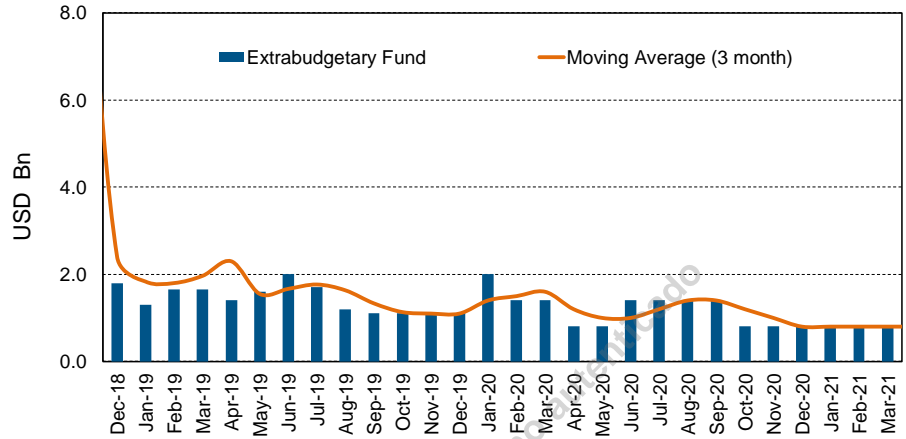
Sources: ONT and Ecoanalítica

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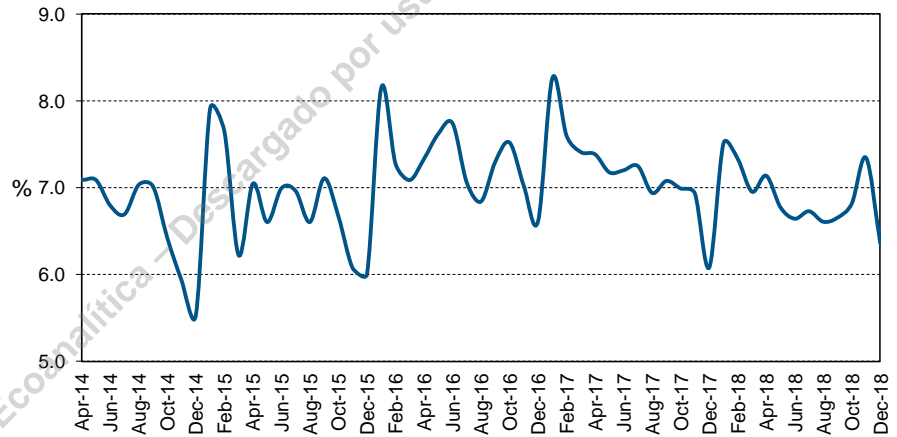
ECONOMIC INDICATORS

State Extrabudgetary Resources



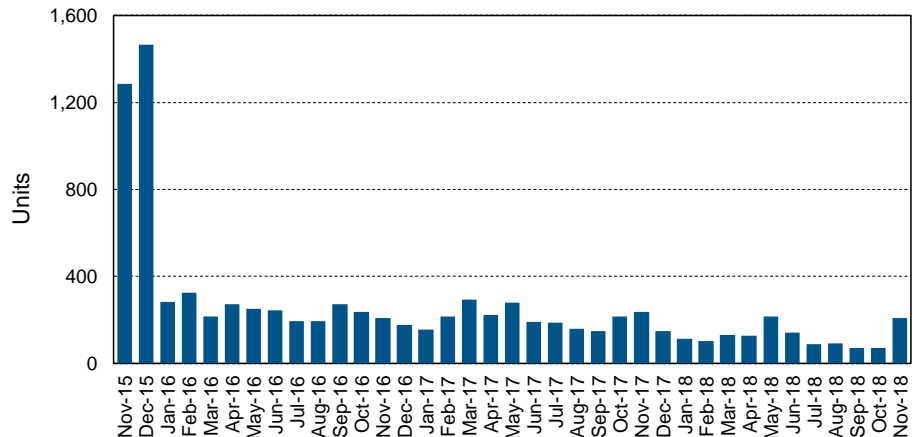
Source: Ecoanalítica

Unemployment Rate



Sources: INE and Ecoanalítica

Vehicle Sales



Sources: CAVENEZ and Ecoanalítica

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