INTERNATIONAL MONETARY FUND

URUGUAY

SELECTED ISSUES

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SELECTED ISSUES

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DISSECTING ECONOMIC GROWTH IN URUGUAY[1]

Following the 2002 crisis, Uruguay had a remarkable economic recovery. The major growth acceleration in 2004–14 was explained by a combination of positive external factors, recovery from crisis, and emergence of new export sectors. With external factors no longer a support for growth, Uruguay needs to leverage its strengths to raise growth sustainably. Uruguay's high level of institutional quality and social cohesion provides a stable container for growth. A comparison relative to its trading partners and high growth peers helps identify areas that Uruguay can further enhance to unleash its growth potential. These include, a strong, flexible, and equitable labor market, better education outcomes, higher private sector dynamism, and continued macro stability.

A. Introduction

1.   Uruguay experienced a major economic boom during 2004–14. Following a severe financial crisis in the early 2000s that disrupted banking system, exchange rate and fiscal position, Uruguay enjoyed one of its most significant economic booms during the period of 2004–14. Over this 10-year span, the annual growth in real GDP per capita averaged 4.9 percent, much higher than the 2.3 percent of Latin America and the Caribbean (LAC).

GDP per Capita Growth: LAC vs Uruguay
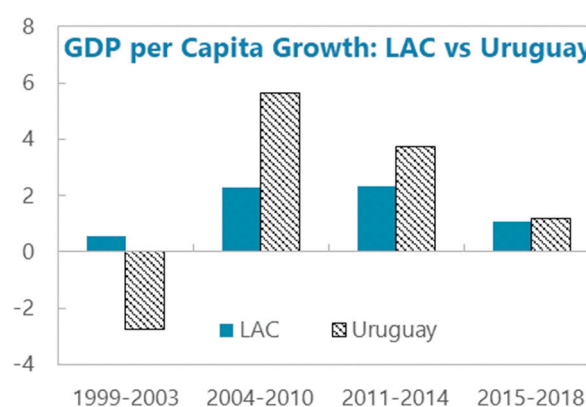
Source: WEO.

2.   The boom facilitated income convergence with advanced economies. The significance of the boom can be seen by examining Uruguay's convergence record with advanced countries. Prior to the boom, for 50 years Uruguay's GDP per capita had been growing at an average annual rate of under 1 percent. Consequently, the GDP per capita relative to the US level had been on a consistent decline since the 1950s, until the trend was sharply reverted in 2004.

Real GDP per Capita (In percent of the US level)
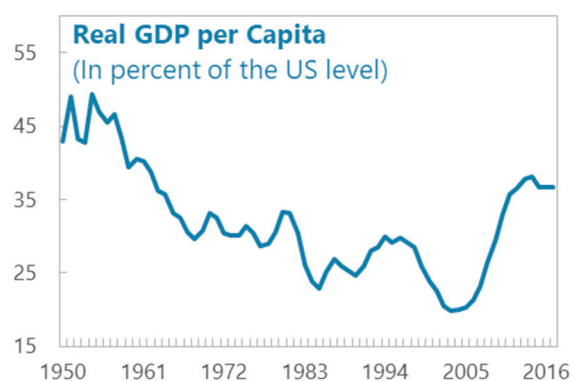
Sources: Penn world table and IMF staff calculations.

3.   Understanding the causes of this recent boom is valuable for designing a long-term growth strategy. Growth has slowed down significantly after 2014—the real GDP growth averaged 1.6 percent from 2015 to 2018. Why has growth dropped? Is the slowdown temporary, or is growth going back to its long-term trend after a brief spike? How to make growth more

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[1] By Natasha Che.

sustainable over the long run? To answer these questions, helpful insights can be gained by differentiating the short-term causes of the recent boom from the sustainable, longer-term causes, and studying the factors that can strengthen the latter.

4.   **Identifying the structural impediments to growth will also inform a sustainable growth strategy.** What structural reforms does Uruguay need to make growth more sustainable? International comparisons can provide a valuable perspective for answering this question. This paper compares the various structural factors of the Uruguay economy with those of a group of countries that were once at a similar income level and have since converged fast with advanced economies, as well as those of Uruguay's export competitors. The goal is to identify potential structural weaknesses where reforms may be necessary to improve the country's international competitiveness and growth potential.

5.   **The paper is structured as follows.** Section B analyses the contributing factors to the recent boom. Section C evaluates their relative importance in the boom. Section D assesses the sustainability of the growth factors. Section E compares Uruguay with the aforementioned peer groups and identifies the potential structural blockages for sustainable growth in Uruguay. Section F concludes.

B.   Causes of the Recent Boom

6.   **The surge in growth during 2004–14 is due to a confluence of demand- and supply-side factors.** These factors, which are explained in more details below, include: the bounce-back effect from the previous crisis, a commodity price boom, increases in demand from Argentina, and the emergence of new export sectors.

Recovery from the Crisis

7.   **Uruguay suffered one of its worst crises in the early 2000s**. The crisis was intimately related to the collapse of the Argentine economy at the time, and the banking and debt crises associated with it. Over the period of 1998–2003, Uruguay's GDP growth averaged -1.7 percent, the worst growth performance in Latin America over that period, except for Argentina and Venezuela.

Sources: WEO and IMF staff calculations.

8.   **Uruguay's growth has been mean-reverting**. An augmented Dickey-Fuller test applied to the annual GDP growth series of Uruguay strongly rejects the null—i.e., the series contains a unit root—at 1 percent level. The stationarity of the growth series suggests that extraordinarily low values in the series tend to be followed by the opposite. The pattern can also be readily observed by visualizing the growth data in a chart. To put in another way, higher growth can be the result of an abnormally low base. The recovery from the

severe recession before 2004 thus partly explains the strong growth for at least the initial years of the boom period.

Terms of Trade Shock and External Demand Boom

***Commodity Price Boom***

9.   The commodity price boom during the 2000s stimulated growth. Around 50 percent of Uruguayan exports are agricultural commodities and their derivatives.[2] In addition to the income effects, the commodity price boom starting in the early 2000s facilitated the growth of value-added and investment of the agricultural sector.

Sources: WEO and IMF staff calculations.

10.   The commodity price boom also had a large impact on Uruguay's export structure. Soybean production and exports rose from nearly negligible in the early 2000s to account for 15 percent of total exports in 2014. The rising demand from China over the period was the main driver of the increase in soybean price. As the price boomed, exports to China also grew. By the end of the boom period, China had surpassed Brazil and Argentina to become the most important export destination of Uruguay, with soybeans accounting for over half of total exports to China.
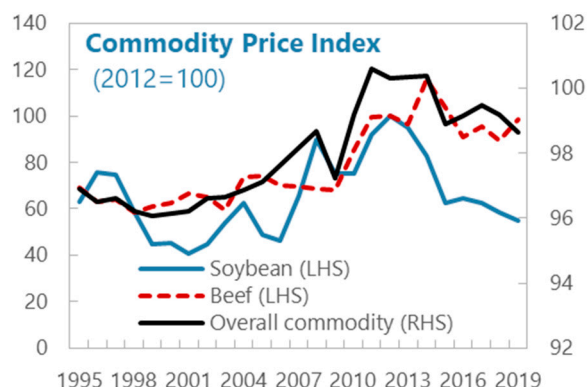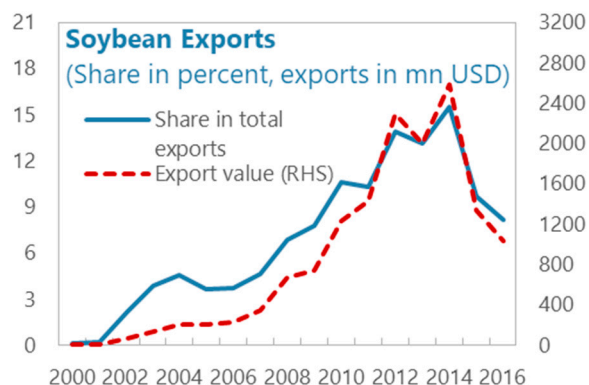
Sources: UN Comtrade and IMF staff calculations.
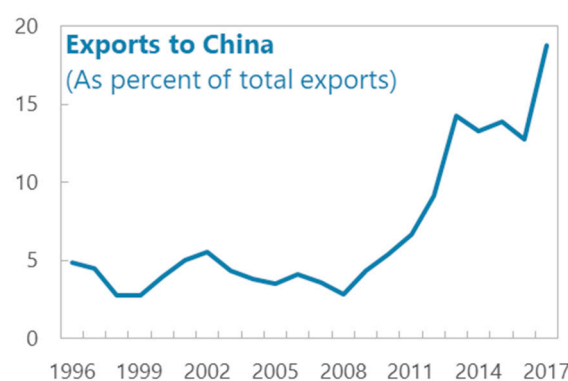
Sources: UN Comtrade and IMF staff calculations.

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[2] The *Banco Central del Uruguay* aggregates the ISIC classification for exports, which consists of three broad categories: primary activities, manufacturing industries, and electricity, gas, and water. Products are classified as part of manufacturing as long as there is an element of post-primary value added. .

Inflows from Argentina

11.   Historically the Uruguayan economy is intimately connected with that of Argentina.
The crisis in the late 1990s is significantly associated with the currency and financial crises in Argentina. After the crisis, the financial linkages with Argentina have been reduced, with nonresident deposit declining from about 40 percent of total deposits in 2001 to less than 10 percent in 2018. On the real economy side, while good exports to Argentina declined (from close to 15 percent of total goods exports in 2001 to less than 5 percent in 2018), the service exports to Argentina, tourism specifically, remains substantial. And as will be discussed in the next section, due to the close association between service exports and domestic nontradable sector, Argentinian tourism demand has an influence on Uruguay's domestic price level.
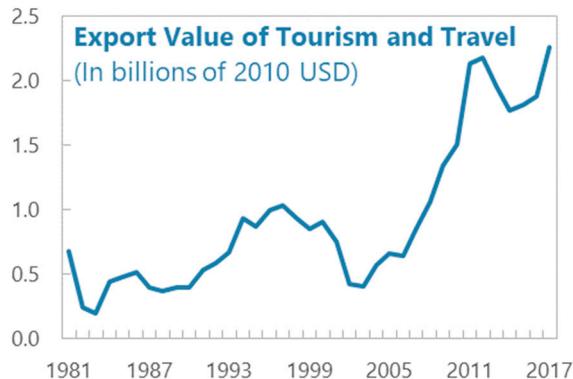
Source: Atlas of Economic Complexity.

12.   Argentine inflows during the boom boosted aggregate demand. During the boom period, like many other Latin American countries, Argentina was a beneficiary of the benign external conditions, including rising commodity prices and world demand. Higher growth, combined with a policy environment that discouraged domestic investments, stimulated investment outflows from Argentina to Uruguay. From 2002 to 2012, annual foreign direct investment (FDI) from Argentina increased by 26 times. In addition, though Uruguay has increasingly diversified its destinations for goods exports throughout the 2000s, Argentina remains the largest client for service exports, notably travel and tourism, which constitutes over 15 percent of total exports. Tourism exports grew at an annual rate of 16 percent during the boom, largely aided by increasing demand from Argentina.

Sources: BCU and IMF staff calculations.

Exchange Rate Appreciation

13.   The nominal and real exchange rates appreciated during the boom in line with regional trends. During the 2000s, due to the positive terms of trade movement and growing commodity demand, currencies of the region almost universally appreciated. Uruguay is no exception, with nominal exchange rate vs. USD appreciating over 20 percent from 2004 to 2014. Real GDP in PPP terms almost doubled over the boom period, compared to 68 percent increase without PPP adjustment.

14.   The income effect from the nominal exchange rate appreciation helped boost domestic demand in the short term. As a small open economy, Uruguay relies on imports to fulfill a large share of its needs in both consumption and investment goods. Thus at least in the short term, the appreciation supported aggregate demand and growth.[3]

Sectoral Structural Change

15.   The 2000s saw significant growth in some of the nontraditional export industries. One example is the information & communication technology (ICT) industry, which has, during the past decade or so, grown to become one of the largest export sectors in Uruguay, with its size growing from 2 percent of total exports at the beginning of the boom years to the current level of over 10 percent. Notably, the capital city Montevideo has become a leading software development/outsource center in the region, exporting primarily (over 50 percent) to the U.S. market, but with an increasingly diversified set of destinations. Meanwhile, after the large investment by UPM, a Finnish forest industry company, in the mid-2000s, cellulose pulp has emerged as another high-growth export industry. The introduction of this new industry has also had a significant impact on the land usage in Uruguay, with an increasing amount of agricultural land being replaced by forest area.

16.   The growth of new industries has been supported by government policies. During the boom Uruguay implemented specific government incentives to encourage the growth of new export industries. For example, exports of software and related services are 100 percent exempted from income tax (Decree 150/2007). The operation of UPM in Uruguay has also benefited from a variety of incentives.

Sources Penn World Table.
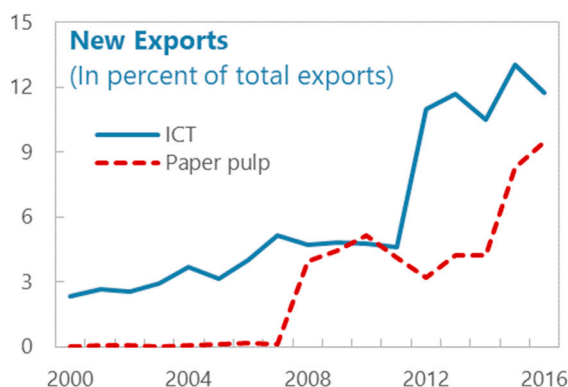
Sources: UN Comtrade and IMF staff calculations.
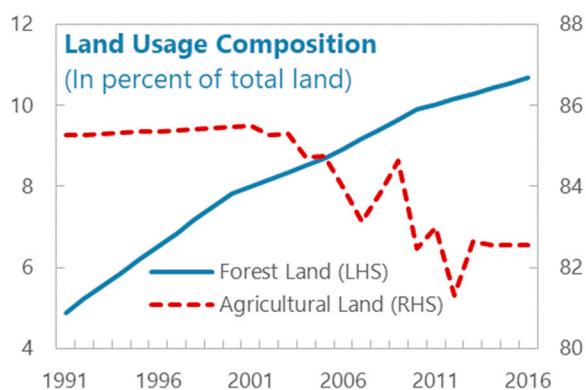
Source: World Bank.

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[3] Also see the Selected Issues Paper for the 2016 Article IV Consultation staff report for Uruguay. A full analysis of the causes and consequences of persistent real effective appreciation (including on competitiveness) would require further research and beyond the scope of this paper.

Productivity Growth

17.   Total factor productivity (TFP) growth seemed stronger during the boom years. The measured TFP[4] saw an increase over the boom period. However, there is a very high correlation between output growth and estimated TFP growth in Uruguay, reflecting the positive terms-of-trade shock, which has reversed after 2014 (see IMF Country Report 18/24 for a detailed discussion). After 2014, the estimated TFP growth has declined substantially.
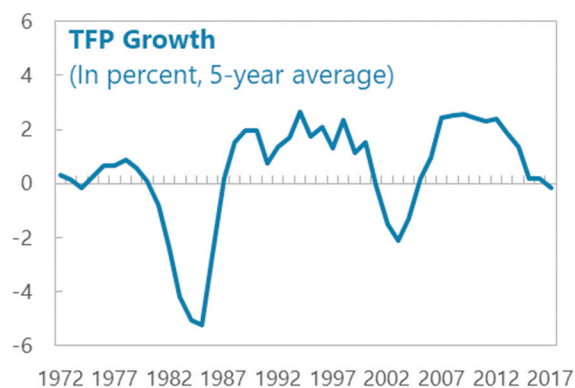
TFP Growth
(In percent, 5-year average)

Sources: Penn world table and IMF staff calculations.

C.   Relative Importance of Growth Factors

18.   To get a broad sense of the importance of different growth factors during the boom years, a simple numerical exercise is run. Even though it is difficult to precisely decompose the cumulative increase in GDP during the boom into the various factors mentioned in the previous section, a numerical exercise was run to gauge their broad magnitudes. For the supply side factors, e.g., ICT, agriculture, tourism, their contribution is calculated as the magnitude of the real increase in the export of that sector during 2004–14, divided by the total increase in real GDP over the same period. For the factor of exchange rate, the estimates by the Selected Issues Paper for Uruguay (2016), of the exchange rate appreciation's impact on GDP, is applied to the data for 2004–14, to calculate the growth impact of nominal appreciation against the USD. To estimate the rebound effect from the previous downturn, first, real GDP growth is regressed on its lag over 5-year intervals. The rebound effect is then calculated as the difference between the growth rate for the 5 years before the boom and the historical average growth rate, multiplied by the estimated regression coefficient.

19.   Rebound from the crisis, positive terms of trade shocks, and emergence of new sectors are among the important factors explaining the 2004–14 boom. The estimation shows that the impact from the rebound accounts for about 13 percent of the boom years' growth. And over 15 percent of the aggregate growth during the period can be attributed to the rise of various commodity exports, such as in soybean and livestock.[5] In addition, the nominal exchange rate appreciation, also associated with the positive movement in terms of trade, explains around 6 percent of the growth during the period. Meanwhile, the export growth from the new industries, i.e., ICT outsourcing and paper pulp, accounts for about 10 percent of the boom-period growth.

20.   The estimation result should be interpreted with caution and used as broad guidance. The estimates are prone to several biases. First of all, it is difficult to separate the impact of one factor from another. For instance, growth in the exports of soybeans and tourism is among the

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[4] TFP calculated by Penn World Tables is used.

[5] This captures both price and quantity effects.

causes of exchange rate appreciation. Therefore, depending on one's perspective, the direct and indirect impact of the supply side factors is likely underestimated. Similarly, external investment inflows also contributed to the appreciation, and therefore indirectly impacting domestic demand, among other possible effects. In addition, it is difficult to isolate the effect of exchange rate appreciation on domestic demand from other factors that boost growth, due to simultaneity bias. Overall, the contribution of appreciation on growth is likely overstated, while the supply-side factors may be understated.

D. Sustainability of Growth Factors

21.   All growth drivers are not created equal. Looking at the various factors that contributed to the boom, it is not difficult to see that some factors are more sustainable than others. In particular, with external factors are no longer a support for growth, identifying the more sustainable growth factors will help us think about how to preserve and strengthen these drivers to achieve sustainable growth for the future. At the same time examining the functioning of the transitory growth factors can shed light on how to better capitalize on the temporary growth opportunities to enhance the country's long-term economic potential.

Sustainability of Supply-Side Factors

22.   Agricultural commodities are likely to provide less support to growth over the long haul.
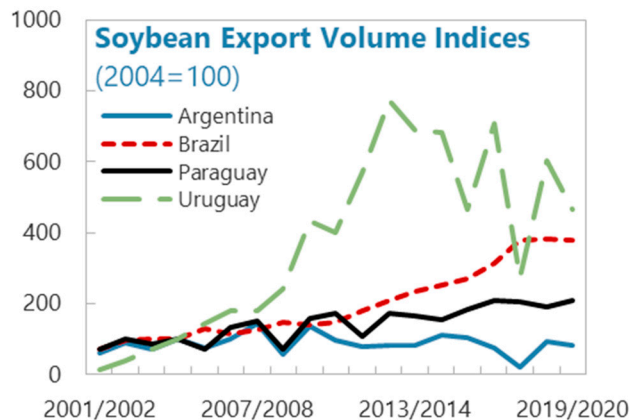
- First of all, despite the price surge during the 2000s, real agricultural commodity prices empirically display a trend decline over the long run, partly owing to the consistently rising productivity of the sector from technological advances.[6] More broadly, commodity prices are expected to remain subdued.[7]

- Secondly, data shows that the increased demand from China explained over 60 percent of the world demand increase in soybeans in the previous decade and a half. Yet with the slowing down of China's growth, soybean price has been on the decline since 2013, and the trend may continue. Meanwhile, although the growth in Uruguay's soybean exports had been initially exponential during the boom years, partly aided by the country's geographical advantage as a regional logistics hub, neighboring countries, Paraguay and Brazil in particular, have shown to be strong competitors in the industry, in terms of both cost and

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[6] See, for example, Harvey, Kellard, Madsen, & Wohar (2017).

[7] *World Economic Outlook*, October 2019.

productivity. As the market price came down after 2013, Uruguay's soybean exports have been on the decline,[8] while those of some neighboring countries continued to grow.

Soybean Export Volume Indices (2004=100)

Argentina
Brazil
Paraguay
Uruguay

Sources: UN Comtrade and IMF staff calculations.

- Without higher investments driven by strong external demand, productivity increase in the commodity sector alone may not be sufficient to support economic convergence. For example, soybean productivity as measured by output per planting area is already at par with the technological frontier, as represented by the sector's productivity in the U.S. And historically, the U.S. soybean sector productivity has been growing at an average rate of 1 percent per year. As such, the productivity growth in the sector would be insufficient to support economic convergence with advanced countries.

- Other emerging export industries may provide a sustaining source of growth, but not without challenges. The forestry and paper pulp industry enjoy relatively stable export prices and steadily increasing world demand over the medium term. With the second pulp mill investment from UPM, the industry is poised to become the largest exporting industry in Uruguay. The growth of the industry is also expected to positively affect regional income convergence within the country, as its operation primarily locates in the less-developed, inland part of Uruguay. However, aside from a one-time, level effect on GDP from the new pulp mill, the industry's long-run impact on growth will depend on to what extent it is able to stimulate the growth of other local, auxiliary industries. That in turn, is affected by the various structural constraints of the Uruguay economy, which will be discussed in the next section.

Wood Pulp Price Index (In 2015 price)
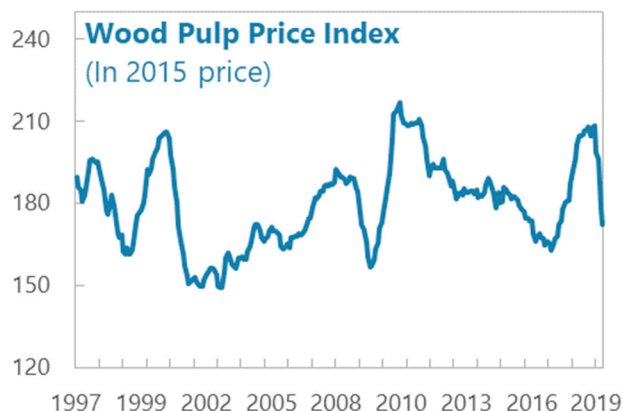
Source: FRED.

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[8] One may argue that some of the decline can be explained by weather shocks. Though that explains the export volatility more than the trend.

23.   The growth prospect of high value-added service exports will depend on the cost, quality, and quantity of labor supply. Over the boom years, the ICT industry grew to be one of the fastest growing export sectors. The comparative advantage of Uruguay in the sector stems from its relatively good telecom infrastructure and its well-educated workforce, in particular compared to other countries in the region. However, data shows that compared to other top ICT exporting countries in the world, Uruguay lags behind in measures of education quality, such as secondary school completion rate and PISA scores and science and math. The quality and quantity of labor supply going forward may pose a challenge to the sector's long-term competitiveness. Efficiency of labor markets (allocation of workers to high productivity sectors), which will be discussed in the next section, will also influence the sector's international competitiveness.

Competitiveness in Human Capital
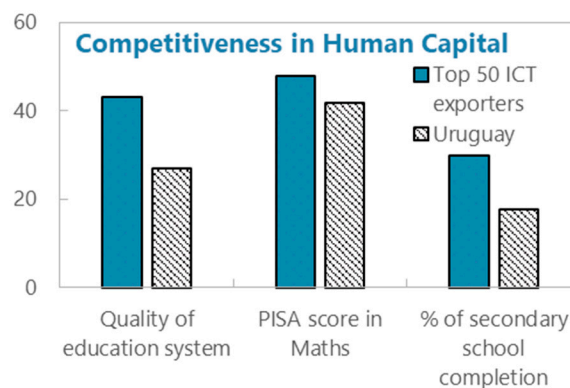
Sources: WEF, UN Comtrade, and IMF staff calculations.

The Role of Exchange Rate

24.   During the boom, nominal appreciation has supported short-term growth. The relationship between growth and exchange rate appreciation is complicated. As a small open economy with a limited domestic market size, the high growth episodes in Uruguay are typically led by positive external demand shocks. And historical data shows that a surge in growth is almost always followed by immediate exchange rate appreciation. To an extent, the nominal appreciation serves to distribute the dividend of external demand windfalls across the population, via de facto increases in income. And the subsequent lift in domestic demand further stimulates growth.

25.   While appreciation of the nominal exchange rate was reversed, the real effective exchange rate remained elevated reflecting various factors. During the commodity boom period (2004 to 2014), Uruguayan peso appreciated in real effective terms by 47 percent– and in real terms against the U.S. dollar by about 100 percent. Following the end of the commodity super cycle, the nominal depreciation did not translate into equivalent real depreciation in effective terms, reflecting both external factors (sharp depreciations of the currencies of its neighbors) and an inflation rate higher than its most trading partners. While competitiveness is a function of a broad set of structural factors, an elevated exchange rate might weaken the competitiveness of the noncommodity tradable sector and reduce firms' profit level, reducing

Exchange Rate vs USD
(Higher = more appreciated, 2005=100)
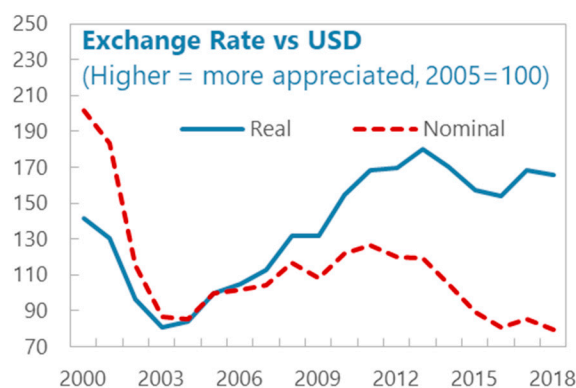
Source: IFS.

investment.[9] This effect may be hard to observe during the boom period, when the general level of economic activity is trending upwards, but it may be more visible when the external demand stimuli are no longer present.[10]

26.   Compared to regional peers, Uruguay seems to experience larger real exchange rate appreciation, which may potentially reflect a large impact of positive external demand shocks on inflation. The impulse response function from a VAR model for Uruguay and its regional peers[11] shows that the short-term response (at t+1) of real exchange rate to GDP shock appears to be among the highest in the region. At the same time, inflation in Uruguay seems to be affected more strongly by terms of trade shocks. A SVAR estimation of terms of trade and inflation indicates a stronger contemporaneous positive impact from the former to the latter, compared to other countries in the region.[12] In addition, this pattern is asymmetrical. When the SVAR estimation is run separately for positive and negative terms of trade shocks, the result shows that the positive linkage between terms of trade shocks and inflation is only present when the shocks are positive. In other words, positive terms of trade shocks have driven up inflation in Uruguay, but negative terms of trade shocks did not seem to do much to inflation.
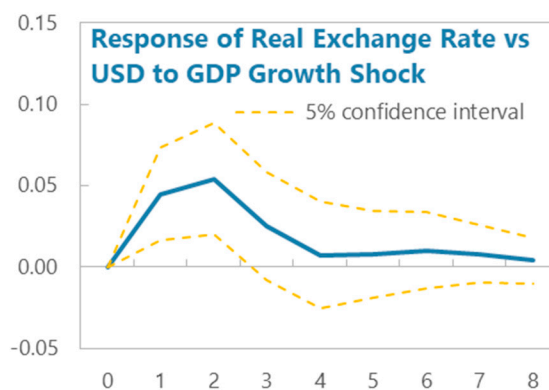
Sources: *WEO* and IMF staff calculations.
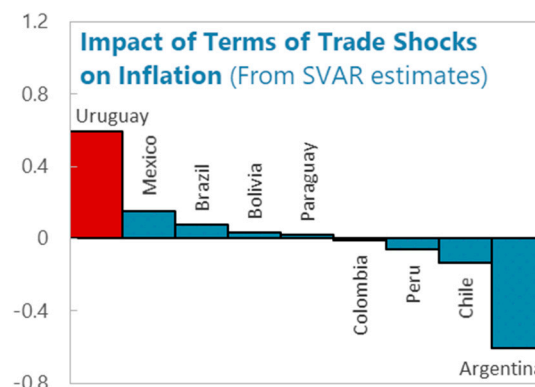
Sources: *WEO* and IMF staff calculations.

27.   This may be partly attributed to the close linkage with the Mercosur market, Argentina in particular. Although over the past two decades Uruguay has significantly diversified its international economic relations, the tie with the regional market remains substantial, and goes beyond the tradeable goods sector. Due to the Argentinian demand on tourism and other services, the prices of which tend to be locally determined, rather than globally set as in the case of most tradable goods, the fluctuations in the Argentinean economy may directly impact the price level of the nontradable sector in Uruguay, which feeds into inflation. And when the economies in the

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[9] Also see Uruguay's Selected Issues Paper on exchange rate and competitiveness, for the IMF 2018 Article IV Consultation.

[10] See Magud and Sosa (2013), Oreiro, Basilio and Souza (2014), Aghion, Bacchetta, Ranciere, and Rogoff (2009).

[11] The model comprises real exchange rate vs USD, terms of trade, and real GDP. The sample consists of data for nine South American countries, from 1999 to 2018 at the annual frequency.

[12] The model consists of CPI inflation, changes in terms of trade and GDP growth on an annual level. The text chart compares the estimated coefficients for contemporaneous effect of terms of trade shock on inflation cross country.

region are hit by the same external shocks, e.g., a surge in commodity prices, the pressure on inflation and real exchange rate tends to come from both global and regional levels, amplifying their impact.

E. Structural Considerations

28.   To improve the sustainability of supply-side growth drivers, structural reforms that increase the dynamism of the domestic private sector are needed. A macroeconomic environment that provides stability and flexibility for private sector firms help strengthen the supply-side growth drivers that are mentioned in the previous section. Identifying what Uruguay's strengths and weaknesses are in terms of the structural factors that define the economic environment is a helpful exercise in this regard.

29.   Comparisons with other countries that were once at a similar development stage can help identify the focus of structural reforms. Conventional wisdom in economic growth often points to the general direction of reforms without taking into account the context of development stages. For example, although it may be easy to see that an educated workforce is good for growth compared to an uneducated workforce, the education level of workers also tends to be endogenous of economic development itself. Thus, to identify the appropriate reform priorities, it is helpful to make cross-country comparisons of structural factors conditional on a country's development stage.

30.   A high-growth peer group is selected for the comparison. The peer group is selected by first identifying the countries that were once at a similar development stage—proxied by their GDP per capita relative to the U.S. level—to Uruguay[13] in 2018, at any point in time since 1950. Within this group, the countries with the fastest speed of economic convergence[14] in the subsequent 10 years are then chosen as the high-growth peer group, provided that there hasn't been any significant reversal in the country's convergence process till 2018.

31.   Also included in the comparison are the trade competitors of Uruguay. These are defined as the countries that have an export basket similar to that of Uruguay. The *resemblance* between two countries is calculated as the cosine similarity score between the vectors of "revealed comparative advantage" scores for all SITC 4-digit goods, for the two countries. (The appendix lists the country/year combinations included in both the high-growth peer group and the trade rival group.)

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[13] Defined as GDP per capita relative to the US falling within a 10 percent band around the level of Uruguay 2018.

[14] Defined as the relative GDP per capita growth being higher than 70 percent of the whole sample.

32. **Uruguay is compared with the two peer groups across various structural factors.** They are categorized into four groups—factors that may affect capital input, labor input, human capital, and total factor productivity of the economy. The appendix lists the data sources of all variables. It should be emphasized that especially for the high-growth peer group, the comparison is done between Uruguay in 2017/2018 and the high-growth countries when their income level was close to that of Uruguay today. When the historical data for a country-year combination is not available, the paper uses data of the closest available year instead.

Investment and Capital Accumulation

33. **Investment rate is low compared to peer groups.** Investment rate has quickly declined after the boom period, from its peak of 25 percent of GDP in 2012 to around 16 percent in 2017,[15] which is close to the historical average rate in Uruguay. And even the peak investment rate during the boom years was still lower than the average of those in high-growth peer countries.
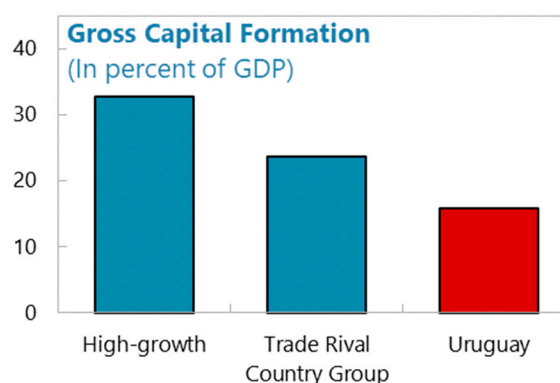


Sources: Penn World table and IMF staff calculations.

34. **Credit to the private sector is also low.** Although obtaining financing is not perceived as difficult according to survey data, the private sector credit to GDP ratio is perennially lower than in most peer countries. This may primarily reflect financing model of private businesses and factors that lower the demand on real investment. On the other hand, supply-side structural issues leading to lower intermediation, such as limited banking sector competition, high lending rates, and insufficient nonbank market financing options may also play a role. The latter is echoed by Uruguay's financial development score, which is lower than both comparison groups.
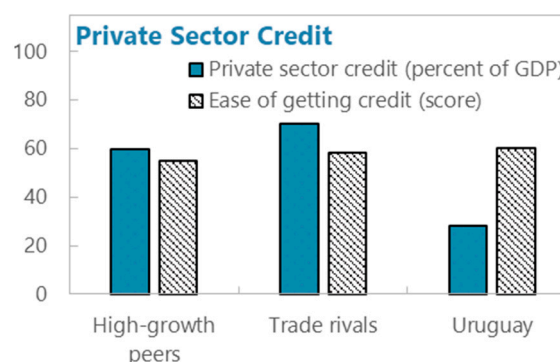
Sources: World Bank and IMF staff calculations.

Labor Market

35. **Uruguay fairs relatively well regarding labor welfare indicators, inequality, poverty, and informality** (see SIP on Labor market conditions). As Uruguay continues to close gaps in living standards with advanced economies, it faces the challenge of maintaining social protection for
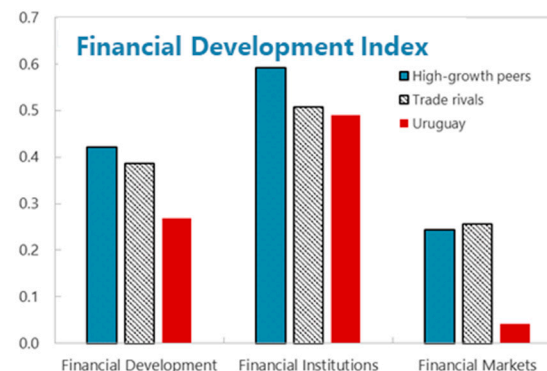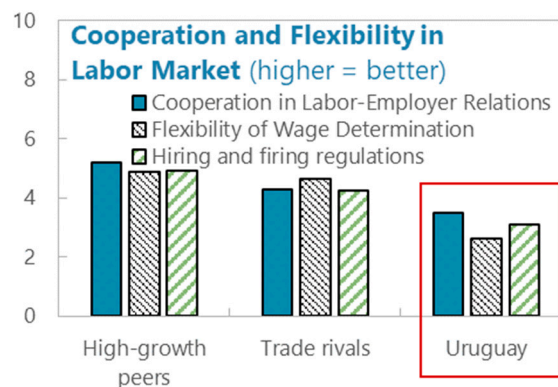

Sources: IMF Financial Development Database.

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[15] For cross country comparability, PPP adjusted data from the Penn World Table are used.

workers while preserving economic efficiency and growth. These achievements, an important part of social cohesion, should be maintained. At the same time, Uruguay—as a small open economy subject to large macroeconomic shocks (including those leading to loss of competitiveness)—needs an adequate degree of labor market flexibility to enable sectoral reallocation of workers to jobs needed for productivity growth (micro flexibility) and to maintain employment at a high level (macro flexibility).
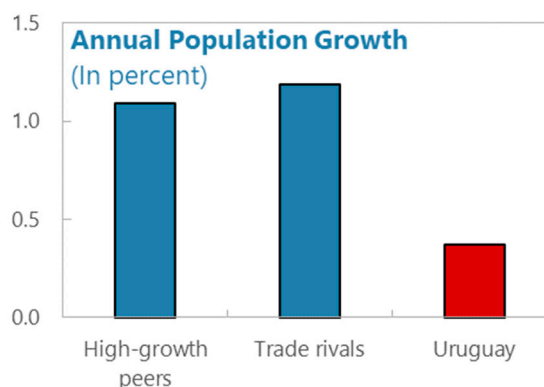
36.   Survey data indicate that Uruguay could benefit from further increasing its labor market efficiency. According to survey data by the World Economic Forum, Uruguay is perceived as less flexible than both high-growth peers and trade rivals, in terms of wage flexibility and hiring and firing regulations. In addition, cooperation in labor-employer relations appear to be less favorable.[16]

Sources: World Economic Forum. IMF staff calculations.

37.   Population growth is low compared to high-growth countries at a similar development stage. The quantity of human capital available in an economy, an essential input for sustainable growth, is strongly correlated with the growth of working-age population. Past researches have also shown that population growth may positively affect productivity growth and speed of innovation, by facilitating the communication and spread of new ideas. It is an established empirical observation that birth rate tends to be negatively correlated with a country's income level, which helps explain the lower population growth in Uruguay compared to most other countries in the LAC region.

Sources: Penn World table and IMF staff calculations.

However, even compared to the high-growth country group at a similar development level, Uruguay has a slower population growth, as well as an older population.

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[16] Since the data is from a perception-based survey, it is not clear if the perceived lack of cooperation in labor-employer relations is related to any specific labor market policies. More research in this regard is needed.
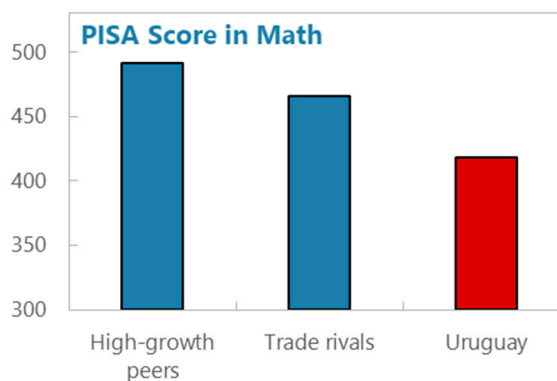
Human Capital

38.   Although quantitative provision of education in Uruguay is at par with the high-growth peers, the quality of human capital lags behind. Uruguay scores similarly to the group of high-growth peer countries in measures of education quantity, such as the average years of schooling. However, survey data of private sector stakeholders indicates that the perceived quality of the education system is lower than in both high-growth peers and trade rivals. In addition, compared to the high-growth peer group, Uruguay scored 12–15 percent lower in the math

PISA Score in Math

Sources: PISA and IMF staff calculations.

and science scales of the PISA assessments, which measure educational achievements in secondary schoolers. This is consistent with the observation from the previous section that the quality of education, which affects the supply of future human capital, in Uruguay lags behind other countries that are also large ICT service exporters.

Productivity

39.   TFP growth is lower than in the high-growth peers. Although the estimated TFP growth increased during the boom (reflecting the terms-of-trade shock), over the past 10 years, the average TFP growth was a little over 1 percent per year, close to the country's historical average, and currently is estimated at around 0–0.5 percent. The TFP growth rate is lower than the average of the high-growth peers at a similar development level, though higher than the average of trade rivals. The following sub-sections will examine the various structural factors that may impact productivity growth.

TFP Growth
(In percent)
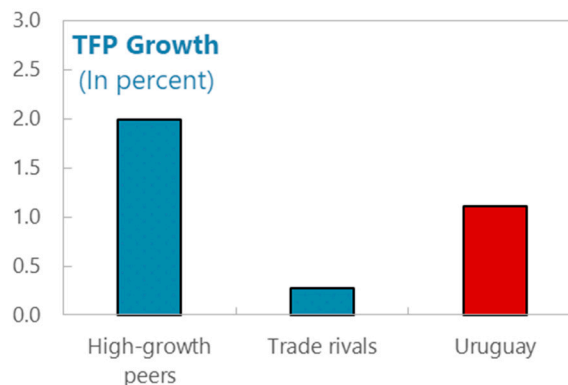
Sources: Penn World table and IMF staff calculations.

Institutional Quality

40.   Uruguay compares favorably in public governance. The country scores better than the average level of both comparison groups in the measures of judicial independence and corruption within the political system. The latter is shown in past researches to likely deter foreign investments, distort price signals in the economic environment, and reduce the efficiency of both public and private sectors. There is however room for improvement in terms of law enforcement, which might reflect rising crime rate in the country.
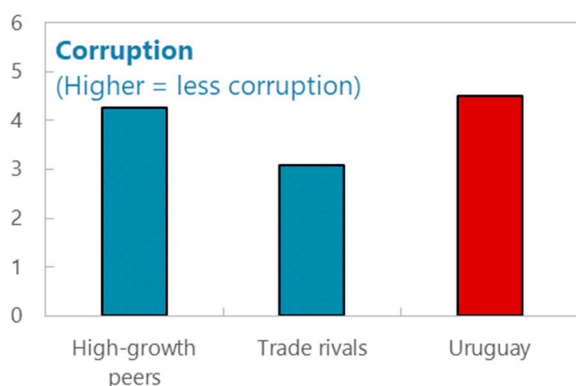
Sources: ICRG and IMF staff calculations.

Sources: ICRG and IMF staff calculations.
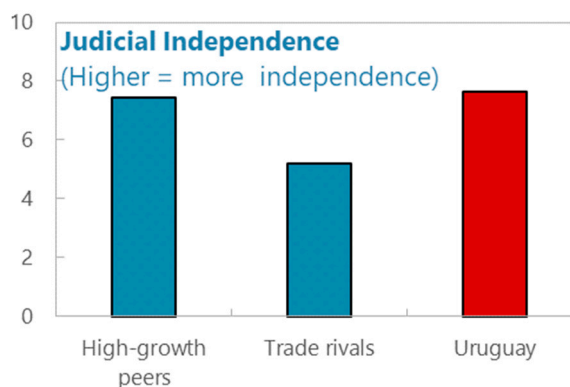
Sources: World Economic Forum and IMF staff calculations.

Infrastructure

41.   The quality of transport infrastructure trails behind high-growth peers and has declined over the years. The quality and quantity of transport infrastructure are crucial for reducing export costs and bridging regional economic inequality. Although the stock of infrastructure capital is not low in Uruguay, due to heavy investments in the late-1970s, infrastructure spending has dropped significantly since the mid-1980s and stayed at an average level of around 4 percent of GDP per year—and for the last few years it fluctuated at around 2 percent of GDP.

Sources: BCU and IMF staff calculations.

The boom years of 2004–14 did not see any significant increase in infrastructure investments. As a result, the overall infrastructure stock has not improved, or even slightly declined, depending on the
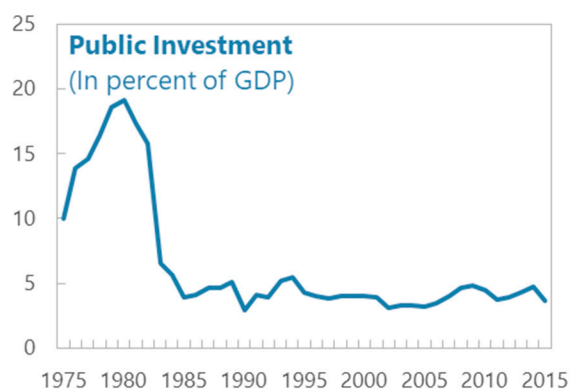
depreciation rate one assumes, over the past 30 years. This helps explain the low score of perceived infrastructure quality compared to the peer groups.

Business Environment

42. Uruguay is broadly at par with the comparison groups regarding some aspects of the business environment, but there is room for improvement. These include, for example, transaction cost associated with regulatory compliance for tradable sector, tax burden, and licensing and permitting procedures. Moreover, many measures of the business environment have seen improvements of various extents over the boom years, including the overall tax and contribution burden, the quality of business regulations, and export costs. There is still room for improvement in further reducing compliance costs of international trade (relative to high growth peers) and time and cost of registering property.
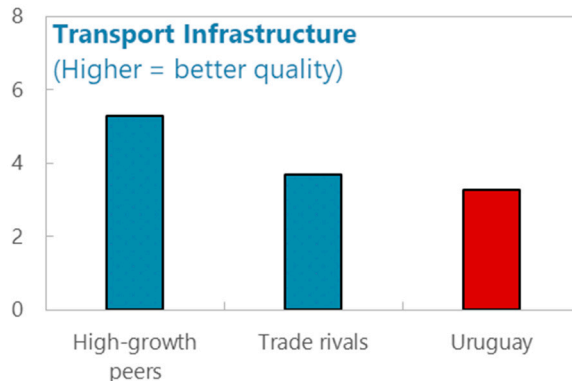
Sources: World Economic Forum and IMF staff calculations.
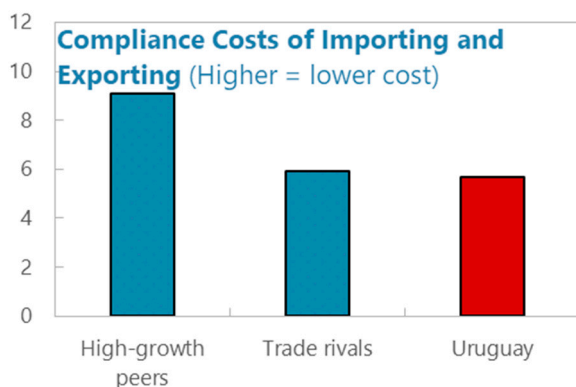
Sources: World Bank and IMF staff calculations.

Sources: World Bank and IMF staff calculations.

Ease of Starting a Business
(Higher = easier to start a business)

Sources: World Bank and IMF staff calculations.

Registering Property
(Higher score = better)
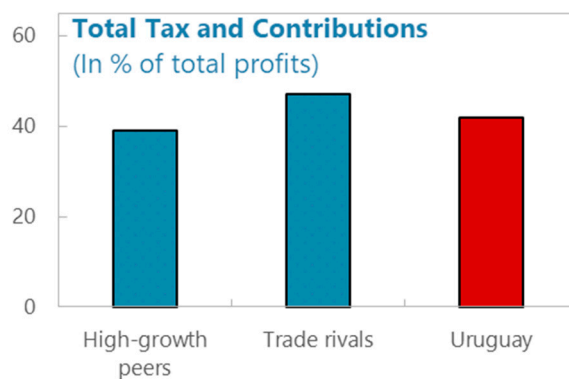
Sources: World Bank and IMF staff calculations.

43.   However, these improvements have not translated into higher dynamism of the private sector. New business activities, as measured by the number of new firm registrations per 1,000 adult population, is 70 percent lower than both peer groups. Moreover, new business activities have been on a trend decline over the past 10 years.

New Business Density
(New registrations per 1000 population)
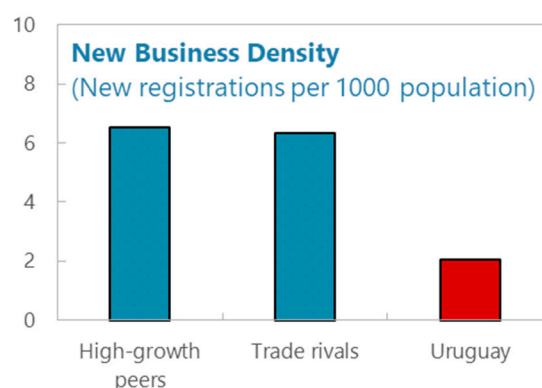
Sources: World Bank and IMF staff calculations.

Macroeconomic Environment

44.   Uruguay has preserved its macroeconomic stability despite severe regional shocks. Over this 10-year span, the annual growth in real GDP per capita averaged 4.9 percent, much higher than the 2.3 percent of Latin America and the Caribbean (LAC). In addition, despite the growth slow down, Uruguay preserved its macro stability in the face of severe regional shocks. In particular, spillovers from Argentina have been limited to the real sector and exc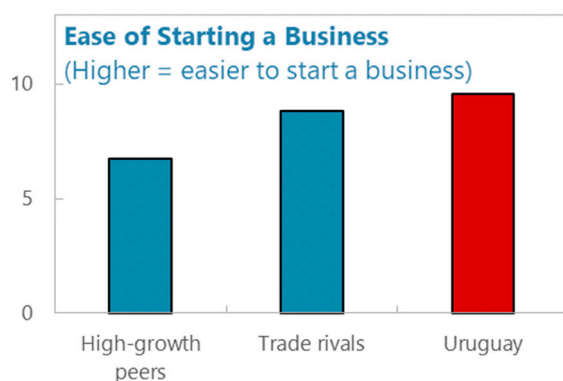hange rate channels, reflecting its robust financial sector, which had markedly reduced its exposure to Argentina prior to the onset of the crisis.

45.   There is still room for further improvements. Public debt level, (nonfinancial public sector), real exchange rate volatility, and dollarization are higher than the average levels of comparison groups. In terms of inflation, Uruguay has much higher inflation than its trade rival group (excluding Argentina) and high-growth peer group in recent years.[17] Keeping inflation low and stable would also help support efforts to reduce dollarization and indexation, deepen financial markets, and increase the effectiveness of monetary policy.

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[17] When Argentina is included, the average inflation of the trade rival group is swayed by the data of Argentina, which is in double digits for much of the sample period. As for the high-growth peer group, inflation in previous decades (1950s–1980s) was generally more elevated than today, reflecting global inflation trends.
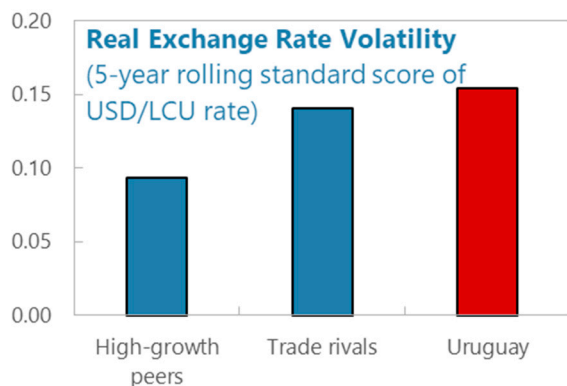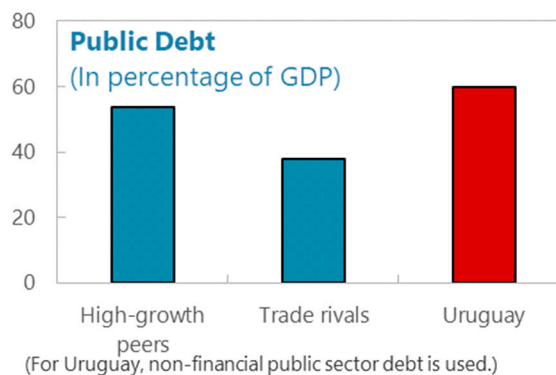
Real Exchange Rate Volatility (5-year rolling standard score of USD/LCU rate)

Sources: WEO and IMF staff calculations.

Public Debt (In percentage of GDP)

(For Uruguay, non-financial public sector debt is used.)

Sources: WEO and IMF staff calculations.

Current Inflation (2014-2018)

Sources: WEO and IMF staff calculations.

Dollarization
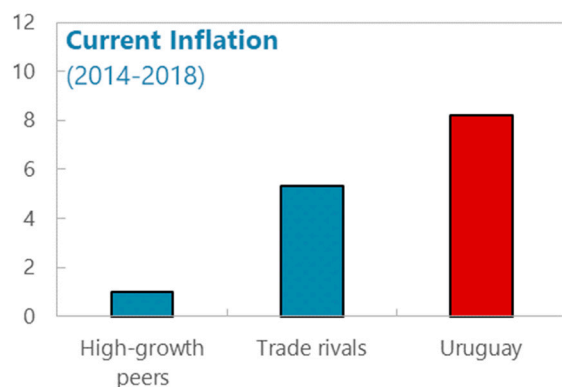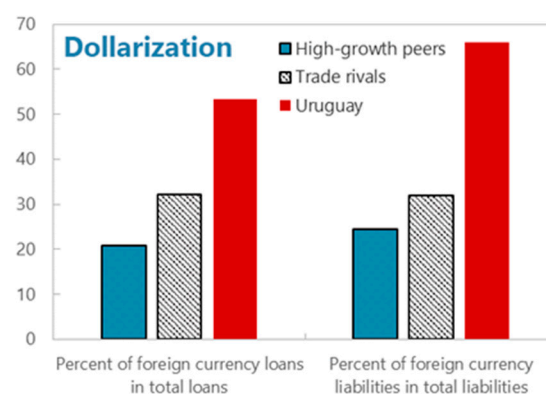
Sources: IFS and IMF staff calculations.

F. Conclusion

46.   The economic boom in Uruguay over 2004–14 was driven by a combination of positive external demand shocks, rebound from the crisis, and emergence of new sectors. The 10-year growth acceleration starting in the mid-2000s was the biggest economic boom in the Uruguay history over the past half century. This boom was propelled by several overlapping factors, including, but not limited to, a bounce back from the crisis in the early-2000s and the growth in external demand of commodities that boosted agricultural export prices, and emergence of new export sectors.

47.   The external demand shocks were particularly strong because they came from both within and outside the region. Although the commodity price boom was primarily driven by the demand from outside Mercosur, demand from within the region increased as well. Because Uruguay's main trading partners in the region, Argentina and Brazil, are also prime beneficiaries of the commodity price boom. The latter manifested as increased capital inflow and demand on tourism, particularly from Argentina.

48.   External conditions are no longer supportive: The commodity super-cycle ended in 2014 and the commodity prices are expected to remain subdued going forward. In addition, potential growth of the global economy and key trading partners of Uruguay (including China) is much lower

than a decade ago. Furthermore, risks to the global growth are on the downside (2019 October, World Economic Outlook) and Uruguay continues to be subject to large exchange rate shocks stemming from the region. Finally, prices of the some of the key export sectors (such as agriculture) may also be affected by a global trend decline, including due to productivity increases.

49. **The emerging new export industries may prove to be a more sustainable driver of growth going forward**. New export sectors such as ICT and related business services, as well as forestry and paper pulp, have grown in importance over the boom years but continued growth of new sectors would require leveraging strengths and eliminating the structural bottlenecks for private sector development.

50. **Uruguay's institutional strengths are key for sustainable growth.** These include the country's strong public governance and a stable regulatory environment for trade and foreign investment. In addition, the ongoing infrastructure projects (upgrading road networks and introducing a central railway) will help close the infrastructure gaps and set the ground for higher growth.

51. **Structural policy reforms on key constraints to the private sector will help realize the potential of the new export industries and set the stage for inclusive growth**.

  a. Strong, flexible, and equitable labor market is key to support inclusive growth in the face of low population growth and declining labor force participation. Further improvements in the efficiency and flexibility of labor market would help facilitate labor allocation to high productivity sectors, accommodate large negative shocks and incentivize employment.

  b. Quality and quantity of education should match the needs of skill-intensive new sectors.

  c. Further improving the business environment, such reducing time and cost of registering property, and financial market development will support the business dynamism.

  d. Low population growth and aging pressures could be alleviated by further raising female participation or facilitating integration of immigrants into labor market.

  e. While crime is still low relative to the regional peers, the recent deterioration in crime rates should be addressed before they become macro critical or affects perception on law enforcement.

52. **A strong and credible macro policy framework is also essential for growth sustainability**. Efforts to reduce debt, inflation, and dollarization and keep them at low levels will lay the foundations for structural reforms to flourish.

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Annex I. The High-Growth Peer Country Group

Country	Year
Austria	1953
China, Hong Kong SAR	1975
Cyprus	1979
Germany	1953
Ireland	1986
Israel	1955
Japan	1966
Malaysia	2005
Malta	1987
Portugal	1987
Republic of Korea	1990
Seychelles	1984
Singapore	1979
Spain	1964
Taiwan	1985

Annex II. The Trade Rival Country Group

Country	Year
Paraguay	2017
New Zealand	2015
Australia	2015
Suriname	2014
Guyana	2017
Argentina	2017

Annex III. Data Sources

| Indicator	Source
Corruption	International Country Risk Guide
Government Stability	International Country Risk Guide
Law & Order	International Country Risk Guide
Bureaucracy Quality	International Country Risk Guide
Cooperation in Labor-employer Relations	World Economic Forum Global Competitiveness Report
Flexibility of Wage Determination	World Economic Forum Global Competitiveness Report
Hiring and Firing Practices	World Economic Forum Global Competitiveness Report
Redundancy Costs	World Economic Forum Global Competitiveness Report
Employees in Workplaces Covered by Unions	World Economic Forum Global Competitiveness Report
Hiring Regulations and Minimum Wage	Fraser Institute Economic Freedom of the World
Hiring and Firing Regulations	Fraser Institute Economic Freedom of the World
Centralized Collective Bargaining	Fraser Institute Economic Freedom of the World
Percentage of Secondary Complete	Barro and Lee Educational Attainment Database
Years of Schooling	Barro and Lee Educational Attainment Database
Percentage of Tertiary Complete	Barro and Lee Educational Attainment Database
PISA Mean Performance on the Mathematics Scale	World Bank Education Statistics
PISA Mean Performance on the Science Scale	World Bank Education Statistics
Quality of the Education System	World Economic Forum Global Competitiveness Report
Transport Infrastructure	World Economic Forum Global Competitiveness Report
Quality of Overall Infrastructure	World Economic Forum Global Competitiveness Report
Domestic Credit to Private Sector (% of GDP)	World Bank Global Financial Development Indicators
Bank Return on Assets	World Bank Global Financial Development Indicators
Getting Credit Score	World Bank Doing Business
Integrity of the Legal System	Fraser Institute Economic Freedom of the World
Judicial Independence	Fraser Institute Economic Freedom of the World
Compliance Costs of Importing and Exporting	World Economic Forum Global Competitiveness Report
Profit Tax (% of profit)	World Bank Doing Business
Labor Tax and Contributions (% of profit)	World Bank Doing Business
Other Taxes (% of profit)	World Bank Doing Business
Total Tax and Contribution Rate (% of profit)	World Bank Doing Business
Starting a Business	World Bank Doing Business
Business Regulations	World Bank Doing Business
Ease of Doing Business Score	World Bank Doing Business
Cost to Export (US$ per container deflated)	World Bank Doing Business
Public Debt (as % of GDP)	IMF World Economic Outlook
REER	IMF World Economic Outlook
Exchange rate	IMF World Economic Outlook
Inflation	IMF World Economic Outlook
Population Growth	World Bank World Development Indicators
New Business Density	World Bank World Development Indicators

IMPACT OF PUBLIC INVESTMENT ON GROWTH IN URUGUAY[1]

A. Introduction

1. Uruguay's infrastructure stock is among the highest in the region, but it has barely grown for over the last three decades.[2] After a public investment push in the late 1970s that boosted the country's infrastructure stock substantially, public investment has dropped to around 4 percent of GDP per year for the past three decades—fluctuating at around 2–2.5 percent of GDP in recent years. Although the investment level is not low by regional comparison, a higher base level of infrastructure stock means more resources are needed for simply maintaining the existing stock. As a result, the quantity and quality of infrastructure have not improved, or have even declined, over the past decades. In particular, compared to both the high-growth peer countries and main trade rivals, Uruguay lags behind in the quality of transport infrastructure.

Public Capital Stock (As percent of GDP, 2015)

Source: IMF Fiscal Affairs Department.

Public Investment (As percent of GDP)
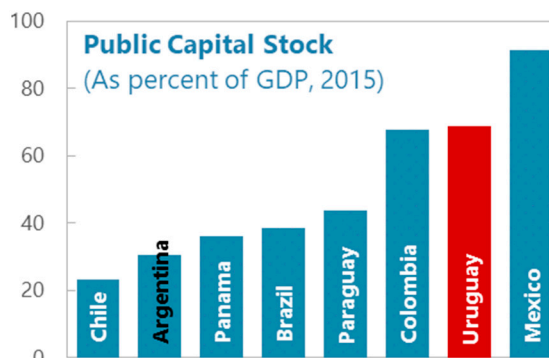
Source: IMF Fiscal Affairs Department.

2. Investment in infrastructure is expected to increase, as various public-private partnerships (PPPs) start to be implemented. These include, for example, the US$800 million central
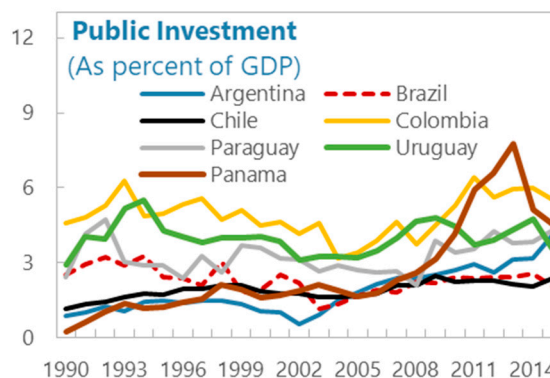
Public Investment (As share of total investment)

Sources: IMF Fiscal Affairs Department.

Index of Public Capital (1980=100)
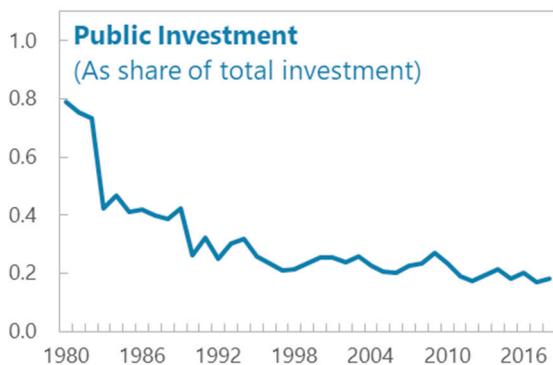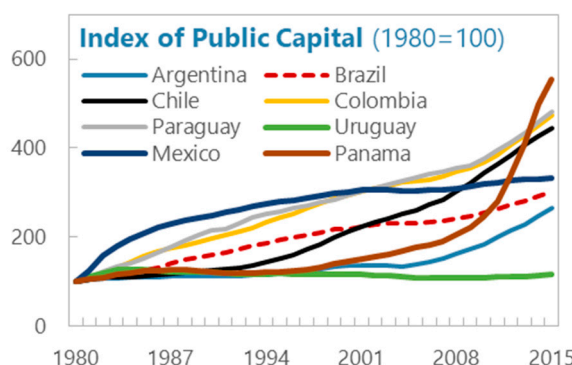
Sources: IMF Fiscal Affairs Department.

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[1] By Natasha Che.

[2] The cross-country data on public capital investment and stock are from IMF Fiscal Affairs Department's Public Capital database.

railway project—which will accompany the investment in a new paper pulp plant by the Finnish forestry company UPM—several projects in road transportation, and projects to improve education infrastructure. The total infrastructure investments over 2019–23 is projected to be around US$2.3 billion (around 4 percent of 2018 GDP).

Projected Infrastructure Investment Amount (2019-2023, in USD mn)					
Year	2019	2020	2021	2022	2023
Amount	304	800.7	724.7	420.7	19

3.   This paper examines the impact of the planned infrastructure investments on Uruguay's real GDP. Three methods are used to estimate the direct and indirect impact of the planned infrastructure investments on GDP growth and level: the direct value-added approach the fiscal multiplier approach, and the general equilibrium approach.

B.   Direct Value-Added Approach

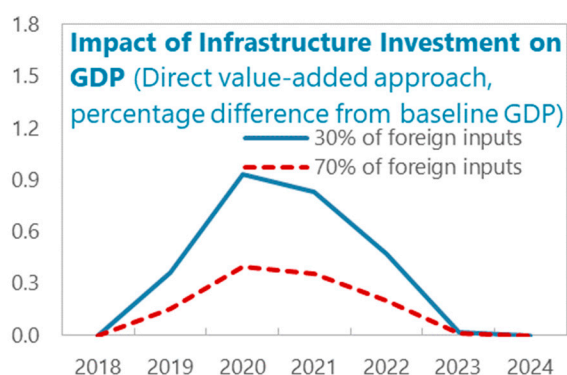**4.   The direct impact of the planned infrastructure investments can be calculated as their contribution to the aggregate investment, minus their contribution to imports**. As a starting off point, we can calculate the direct impact of these investments on GDP by adding the projected investment amounts to each projection year's aggregate investments, while adding the imported components (e.g., imported machinery and materials) of the investments to the aggregate imports. The chart below shows the direct impact on GDP under the alternative assumptions of 30 percent of imported components and 70 percent of imported components. The results show that for 2020, the year of the highest infrastructure investment amount, the impact on GDP ranges from 0.4 to close to 1 percent of GDP. And since this approach does not assume any indirect, lagged, or knock-on effect on the rest of the economy, the projected impact goes back to zero after the investment projects are completed in 2023.

Impact of Infrastructure Investment on GDP (Direct value-added approach, percentage difference from baseline GDP)
— 30% of foreign inputs
- - - 70% of foreign inputs

Sources: BCU and IMF staff calculations.

C.   Fiscal Multiplier Approach

5.   Fiscal multipliers for various government spending categories have been extensively studied in the literature. As the PPP infrastructure investments are ultimately government investment on infrastructure, the multiplier literature would shed light on their potential impact on economic activity. Taking the literature as a whole, one may conclude that the size of such multipliers varies greatly across country and spending category, and it is influenced by some country-specific conditions. This section reviews the relevant literature, identifies a possible range of public investment multipliers for Uruguay, and then applies the multipliers to the projected infrastructure investment data to estimate their potential impact on growth.

Public and Private Capital Stocks of Uruguay
(In bn USD, 2010 price)

— Public capital stock
- - - Private capital stock
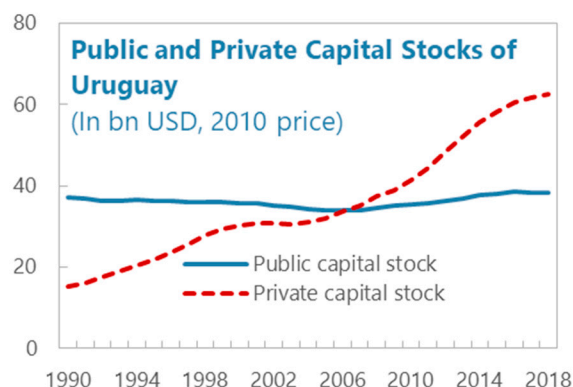
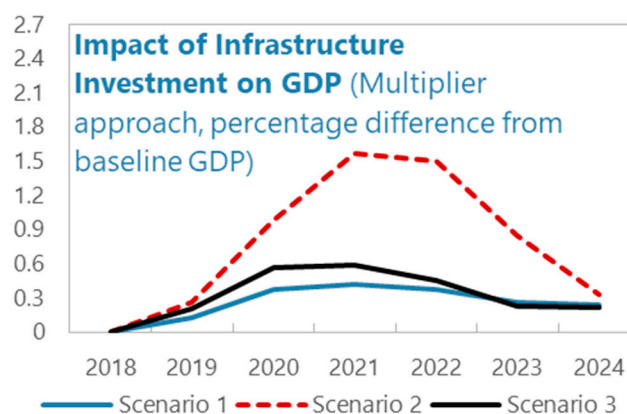Sources: BCU and IMF staff calculations.

6.   The results from various research papers are considered for their application to Uruguay. The econometric estimates of the public investment multipliers for Uruguay are less reliable because the public investment has not much moved much in the past three decades, and there are not sufficient public investment announcements to identify exogenous public investment shocks. While there is a wide literature on fiscal multipliers, the paper paid attention to studies that 1) focuses on the multiplier of government investment, and 2) focuses on either emerging market countries similar to Uruguay or the Latin America region. The appendix presents the summary findings of seven research papers fitting these criteria.

7.   The size of the multiplier depends on a range of factors, and ranges between 0.1–0.5 percent for the short term and 0.4–1.5 percent for the long term. The results laid out in the appendix table reveal the following patterns. First, the public investment multiplier is generally higher in advanced economies than in emerging and developing economies. This is likely due to the higher investment efficiency, as well as the stronger interconnections among different sectors, in advanced countries. In addition, studies show that the investment multiplier tends to be larger during recession and in countries with higher public investment efficiency. If debt levels are low, multipliers are also larger when the investment is debt-financed rather than budget neutral, reflecting demand effects of fiscal stimulus. If, however, debt levels are already high, multipliers could be lower or even negative under extreme circumstances. Some studies find that the size of the multiplier is negatively correlated with a country's trade openness and public debt level. Finally, the investment multipliers in Latin American economies are found to be smaller compared to those in other parts of the world.[3]

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[3] IMF Regional Economic Outlook, April 2018.

8.   Compared to the baseline, the planned infrastructure projects are estimated to increase real GDP level for the 2019–24 period. Three sets of multiplier estimations are selected from the literature and applied to the planned public investment series in Uruguay for the next few years. Specifically, the multiplier estimations are sourced from 1) IMF's World Economic Outlook (2014), 2) IMF's Regional Economic Outlook for Latin America (2018), and 3) Furceri & Li (2017). The results are dubbed as scenarios 1–3, respectively, in the chart below.

Impact of Infrastructure Investment on GDP (Multiplier approach, percentage difference from baseline GDP)

Sources: BCU and IMF staff calculations.

Two of the three scenarios suggest that the GDP growth with infrastructure investment will be higher compared to the baseline, throughout the projection period.[4] By the end of 2024, the real GDP level under the scenarios with infrastructure investment is 1 to 1.8 percent higher than the baseline.

D.   General Equilibrium Approach[5]

9.   The IMF's Global Integrated Monetary and Fiscal Model (GIMF) is calibrated for Uruguay (Box 1).[6] The calibration is based on the recent values of basic macroeconomic variables. Regarding the share of liquidity constrained households in the economy, simulations are run for both 50 percent—close to the estimated share for Uruguay—and 25 percent—the average share for advanced economies.

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[4] For scenario 2, growth would be higher than baseline from 2019 to 2022, and then drop lower than baseline for the subsequent two years due to higher base GDP.

[5] GIMF simulations are run by Keiko Honjo.

[6] For detailed documentation on the structure of the model see Kumhof and others (2010).

Box 1. Summary of GIMF Properties

GIMF is a multi-country Dynamic Stochastic General Equilibrium (DSGE) model with optimizing behavior by households and firms, and full intertemporal stock-flow accounting. In the model, frictions in the form of sticky prices and wages, real adjustment costs, liquidity-constrained households, along with finite-planning horizons of households, help to capture the important role for monetary and fiscal policy in economic stabilization.

The non-Ricardian features of the model provide non-neutrality in both spending-based and revenue-based fiscal measures, which makes the model particularly suitable to analyze fiscal policy questions. In particular, fiscal policy can stimulate the level of economic activity in the short run, but sustained government deficits crowd out private investment and net foreign assets in the long run.

Firms employ capital and labor to produce tradable and nontradable intermediate goods. There is a financial sector a la Bernanke, Gertler and Gilchrist (1999), that incorporates a procyclical financial accelerator, with the cost of external finance facing firms rising with their indebtedness.

GIMF is multi-region, encompassing the entire world economy, explicitly modeling all the bilateral trade flows and their relative prices for each region, including exchange rates. The version used in this paper comprises 6 regions: The United States, the euro area, Uruguay, Latin America excluding Uruguay, emerging Asia (including China), and, as a single entity, the remaining countries.
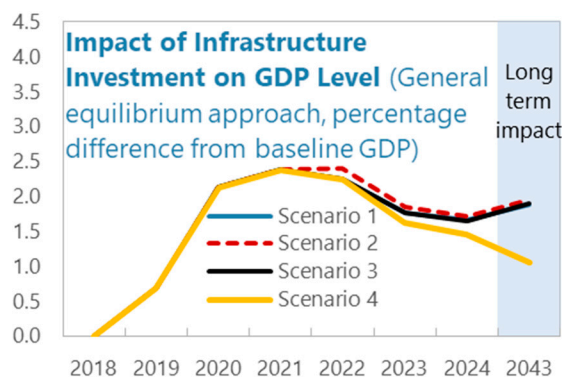
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10.   Simulation results suggest a significant impact of planned infrastructure investments on Uruguay GDP. These results should be interpreted as the upper bound because: i) simulations assume that all investments (roads, rail roads and education projects) are equally productivity enhancing; ii) there are no efficiency losses; iii) the model has strong financial accelerator properties (through equity and lending channels), amplifying the short-term demand effects, which are not present in Uruguayan economy; and finally iii) to the extent that a part of the investment is done by foreign companies the wealth effects will be smaller than implied by the model. Key contributing factors affecting the simulation results in the short-term are the share of liquidity constrained households which magnifies the impact of short-term investment. Infrastructure investment is assumed to be debt-financed and paid back over time through a small fiscal adjustment either by raising consumption taxes (VAT) or cutting transfers. Finally, the infrastructure investment would increase the level of public capital stock. But maintaining the stock at a high level requires maintenance costs. If the maintenance costs are minimal (0.08 percent of GDP) public capital depreciates through time—consistent with Uruguay's past experience.

11.   Specifically, four scenarios are simulated. In scenario 1, it is assumed that the government will finance its availability payment obligations to its private sector partners for these projects by raising consumption taxes (which could be in the form of reducing exemptions). Scenario 2 assumes that the availability payments will be financed through reducing public transfers. Both scenarios assume that around 50 percent of the households in the country are liquidity-constrained. Scenario 3 assumes that the share of liquidity-constrained households is around 25 percent, while the availability payments are financed through raising consumption tax. In scenario 4, it is assumed that maintenance spending after the implementation of investment projects is 2/3 lower than the level required to keep the public capital stock constant, while in all other scenarios, the level of maintenance spending is assumed to cover the capital depreciation entirely.

12. **The short-term implications on GDP level are similar,** mainly affected by the path of planned investment and its indirect demand effects. By 2024, the GDP level is projected to be roughly 1½–1¾ percent higher than the baseline (i.e. the scenario without the planned public investments).

13. **The real GDP level is permanently higher, but its magnitude in the long-term will depend on whether the public investments are maintained.** If the public capital stock is maintained, in the long-term real GDP could be 2 percent higher than in the baseline. If, however, public capital stock declines over time as a result of insufficient investment spending on maintenance, the impact on real GDP will be much smaller, at around 1 percent. Using consumption tax for fiscal adjustment is more distortionary compared to using transfers, and therefore the impact on real GDP are marginally lower in the former scenario.

Impact of Infrastructure Investment on GDP Level (General equilibrium approach, percentage difference from baseline GDP)

Sources: BCU and IMF staff calculations.

E. Conclusion

14. **The level of infrastructure investment in Uruguay is projected to increase in the next few years**. Although public investment spending level is not low compared to regional peers, the public capital stock in Uruguay has barely increased over the past decades, as maintaining the large initial stock would have required higher maintenance investment. The planned infrastructure projects are expected to close the infrastructure gaps, both in term of quality and quantity, and therefore help increase productivity, reduce export costs, boosts economic catchup of poorer regions in the country, and therefore raise the level of real GDP.

15. **These infrastructure investments are expected to have a positive impact on real GDP level, though the magnitude of the impact depends on many factors**. While GDP growth rates will be higher when the infrastructure investment takes place, the growth impact will decline with the completion of projects. But the level of real GDP is expected to be permanently higher compared to the baseline reflecting productivity effects. This paper assesses the direct and indirect GDP level effects from the planned infrastructure investments by using three approaches: i) direct value-added approach, ii) multipliers; and iii) simulation of a general equilibrium model. While all three approaches suggest a positive effect on growth, the estimated magnitude of impact varies widely. The short-term effects are highly dependent on the size and presence of the indirect demand channels. Assuming some degree of indirect impact, as is the case with the multiplier and the general equilibrium approaches, the increase in GDP level compared to the baseline, by the end of the five-year projection period, ranges from 1 percent to 1¾ percent. The longer-term effects will depend on if these investments are maintained through higher public investment and can range between 1 percent to 2 percent.

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Paper	Country/Region	Sample Period	Main Findings	Notes/Caveats
Bom and Ligthart, 2014: What have we learned from three decades of research on the productivity of public capital?	A Meta-analytical technique survey: 68 studies and 578 estimates. Time series for 22 countries, 6 cross-section studies.	1983–2008	- In the short-run, the output elasticity of public capital installed at the central level of government is **0.083**. - In the long-run, the elasticity increases to **0.122**. - After correcting the publication bias, average output elasticity of public capital in the short-run increases to **0.106**.	- All countries considered in the studies are advanced economies, where 44 percent of the studies are based on the US data. - Focuses on papers that use production function approach only. - If public capital consists only of its core component and is installed by lower levels of government, the short-run multiplier becomes **0.154** and long-run multiplier reaches to **0.193**. - Business cycles do not affect elasticity. - Public capital is more productive in the long-run. - Output elasticity of public capital has declined over time.
IMF, REO, April 2018: Fiscal Multipliers: How Will Consolidation Affect Latin America and the Caribbean?	Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Jamaica, Mexico, Paraguay, Peru, and Uruguay.	1989-2016	The multiplier for public investment in the contemporaneous year is estimated to be around **0.5** and reaches to almost **1.5** after 2 years.	- Expenditure vs. investment: Public investment multiplier reaches almost **1.5** - Degree of slack: No significant impact. - Sovereign default risk: a higher risk decreases multiplier to **0.6** after two years. With low default risk, the multiplier is **1.1**. - Expenditure vs. tax: expenditure multiplier lies between **0.5** and **1.1**. No difference between spending cut and tax hike multipliers.

| Paper	Country/Region	Sample Period	Main Findings	Notes/Caveats
Ramirez and Nazmi, 2003: Public Investment and Economic Growth in Latin America: An Empir ical Test	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, and Uruguay	1983-1993	- An estimated coefficient of **0.014** for the effect of public investment on growth rate of real per-capita GDP.	
Furceri and Li, 2017: The Macroeconomic (and Distributional) Effects of Public Investment in Developing Economies	79 emerging and low-income countries listed in IMF-WEO.	1990-2013	**-** A short-term public investment multiplier of **0.2** and a long-term public investment multiplier of **0.4**.	- Business cycle: Multipliers are higher during recessions. Long-term multiplier is almost doubled. - Exchange rate regime: Multipliers are substantially higher under fixed-exchange rate regime. - Trade openness: Lower openness results in relatively higher multipliers. - Initial debt-to-GDP position: Lower ratios result in higher multipliers. - Investment efficiency: Multipliers are significantly stronger in countries with higher public investment efficiency.
Kraay, 2014: Government Spending Multipliers in Developing Countries: Evidence from Lending by Official Creditors	102 Developing Countries	1970-2010	- One-year spending multiplier is estimated to be between **0.2** and **0.4**.	- Multipliers are larger during recessions, with less international trade and under flexible exchange rate regime.

Paper	Country/Region	Sample Period	Main Findings	Notes/Caveats
Ilzetzki, Mendoza and Vegh 2013: How big (small?) are fiscal multipliers?	20 high income and 24 developing countries	1960:Q1 to 2007:Q4	**Short-term multiplier (a quarter)** High income: **0.57** Developing: **0.39** **Long term multiplier** High income: **1.5** Developing: **1.6**	- Multiplier is larger in industrial countries. - Fixed ER: short-term multiplier (0.15) long-term multiplier (1.4). - Close to trade: Short-term multiplier (0.61), long-term multiplier (1.1) - High-debt countries: multiplier is negative.
IMF WEO, 2014, Chapter 3: Is it time for an infrastructure push? The macroeconomic effects of public investment.	36 Advanced and 153 Emerging Market and Developing Economies	1985-2013	**Empirical Results for emerging and developing economies:** The contemporaneous effect of a 1pp of GDP increase in public investment is a **0.25 percent** increase in output and **0.5 percent** four years after the shock.	1. Degree of economic slack: output increases by about **1.5%** in the same year and by **3 percent** in the medium term in a low growth period. 2. Efficiency of public investment: high (low) efficiency: output increases by about **0.8** (**0.2**percent in the same year and by **2.6** (**0.7** percent four years after. 3. The way the investment is financed: debt-financed shock: output increases by about **0.9 percent** in the same year and by **2.9 percent** four years after the shock.

LABOR MARKETS IN URUGUAY[1]

Uruguay enjoys favorable social outcomes and its labor indicators are broadly comparable to other Latin American countries, but its youth unemployment is one of the highest in the world. As a first step in understanding this duality, we employ synthetic panels from repeated household surveys for LA6 countries from 1990–2018 to investigate the determinants of the youth-to-adult unemployment gap. We find that in Uruguay most of the gap cannot be explained by standard variables, which leaves the possibility that other uncontrolled factors could be responsible for this dualism. Further analysis is warranted using microlevel data and controlling for labor market institutional characteristics.

A.   Characteristics of Labor Markets

1.   Uruguay enjoys one of the highest living standards in Latin America, also reflecting favorable labor conditions. Following the 2002 crisis, the country had a remarkable recovery in its social and economic indicators. It ranks quite favorably among its regional counterparts, with relatively low levels of poverty and inequality, and substantial social protection. A high proportion of workers contribute to social security (in fact, informal employment is the lowest in the region) and most old-age persons receive a pension. Workers have a relatively short workweek (39 hours), receive wages with adequate purchasing power and have access to unemployment insurance after contributing for a relatively short period.

Source: WB WDI.

Source: WB WDI.

Source: WB WDI (ILO estimate).

Source: IDB SIMS.
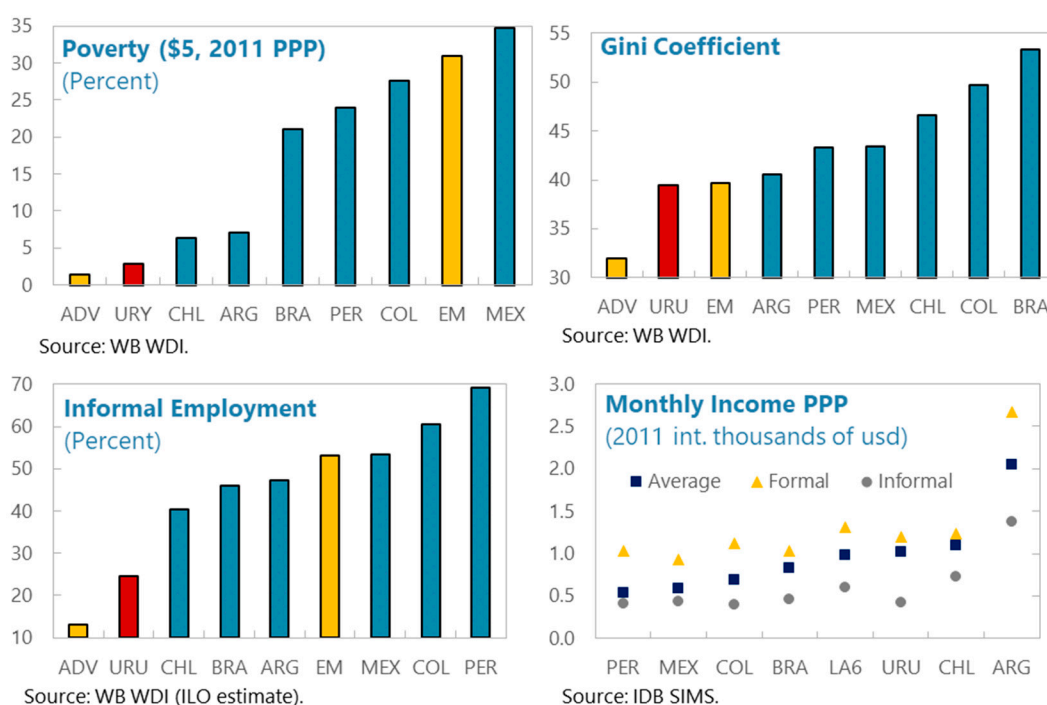
2.   Concurrent with the economic upswing, the government implemented a labor reform. In 2005, the newly elected government reinstated the wage councils (which had been suspended

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[1] Prepared by Sidonia McKenzie and Jose Torres.

since 1992).[2] The reform, more than tripled the share of workers protected by collective bargaining (from 28 percent in 2000 to over 97 percent in 2005) and strengthened the regulations on wage negotiations (Mazzuchi, 2009). As a result, Uruguay now has the highest coverage of collective bargaining in the region with levels comparable to OECD countries. Although, evidence on collective bargaining coverage in Latin America suggests they may create "insider-outsider" problems for workers not formally employed (Kugler, 2019). In [2014], the government introduced revised guidelines for the sixth round of the wage bargaining councils, incorporating productivity considerations and delinking wages from past inflation.

3.   Labor market conditions have been deteriorating since 2014. Labor markets flourished during a remarkable decade of vigorous growth between 2004–14 (averaging 5.3 percent). During that period, employment and labor force participation rose by 10 and 6 percentage points respectively, and real wage increases averaged 4.1 percent per year. However, in tandem with the decline in growth (averaging 1.6 since 2015), labor market indicators have gradually deteriorated, particularly for the most vulnerable. Employment and labor force participation declined by 2.5 and 1.8 percentage points respectively, while annual real wages increases slowed to 1.6 percent since 2014.
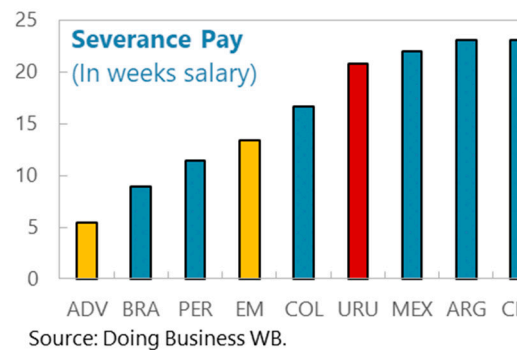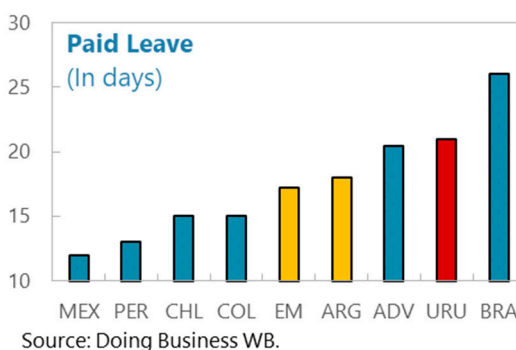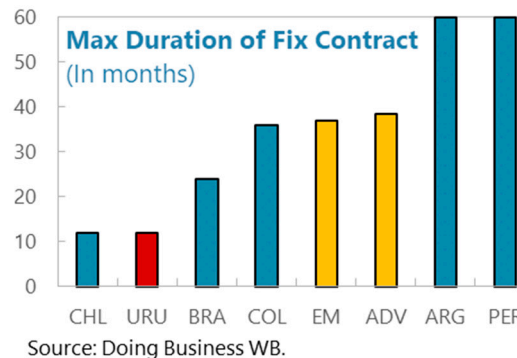

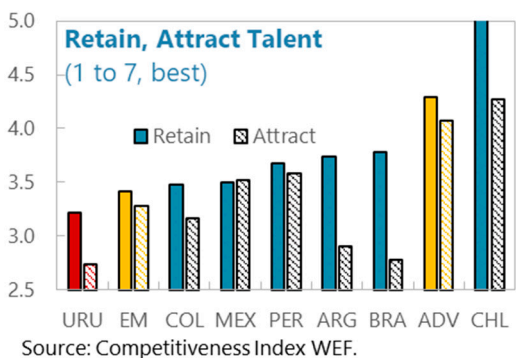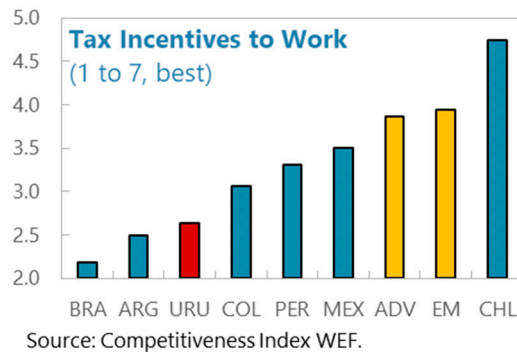**Participation and Employment Rate.** (Percent) 1/
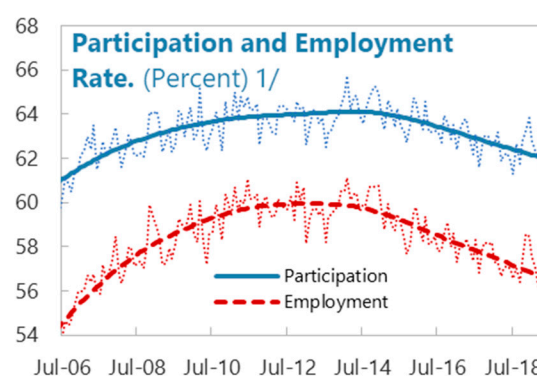
1/ Solid line HP trend.
Sources: INE and author's estimates.

4.   Executive opinion surveys signal perceptions of low flexibility and elevated labor costs in certain areas. Data from the 2018 Global Competitiveness Report (from the World Economic Forum) suggest that employment practices are perceived to be less flexible, that taxes and contributions add to labor costs, and that attracting and retaining talent are somewhat difficult. Furthermore, labor costs (in addition to real wages and contributions) reflect high premium for overtime work, high number of paid leave days, and high severance payments. Finally, fixed-term contracts tend to be for relatively short duration.

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[2] Between 1992-2005, wage negotiations were done at the firm-level.

Hire and Fire Practices
(1 to 7, best)

BRA ARG PER URU CHL COL MEX EM ADV
Source: Competitiveness Index WEF.

Tax Incentives to Work
(1 to 7, best)

BRA ARG URU COL PER MEX ADV EM CHL
Source: Competitiveness Index WEF.

Retain, Attract Talent
(1 to 7, best)

■ Retain ▨ Attract

URU EM COL MEX PER ARG BRA ADV CHL
Source: Competitiveness Index WEF.

Max Duration of Fix Contract
(In months)

CHL URU BRA COL EM ADV ARG PER
Source: Doing Business WB.

Paid Leave
(In days)

MEX PER CHL COL EM ARG ADV URU BRA
Source: Doing Business WB.

Severance Pay
(In weeks salary)

ADV BRA PER EM COL URU MEX ARG CHL
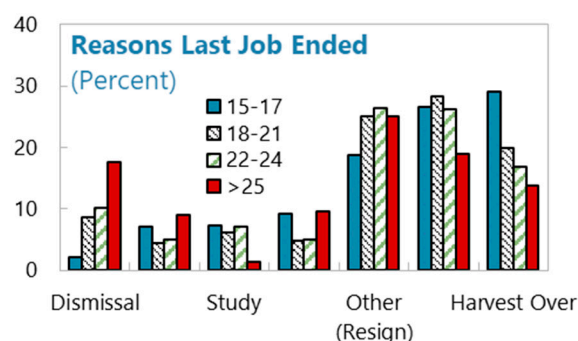Source: Doing Business WB.
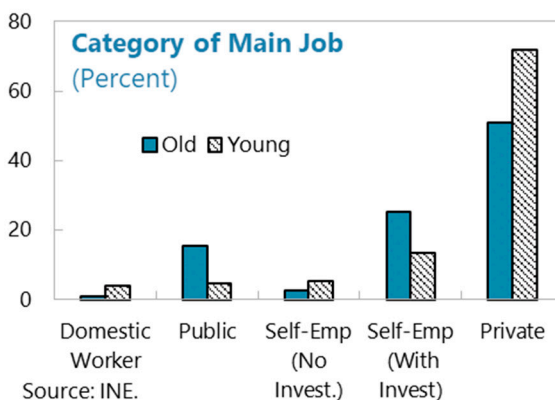
B. Youth Unemployment

5.   Labor indicators are comparable to peers, but youth unemployment is one of the highest in the world. Despite the recent worsening, Uruguay's unemployment rate (about 9 percent) remains comparable to regional peers and other emerging economies. However, youth unemployment (about 27 percent for those aged 16–24, as defined by the ILO) has severely
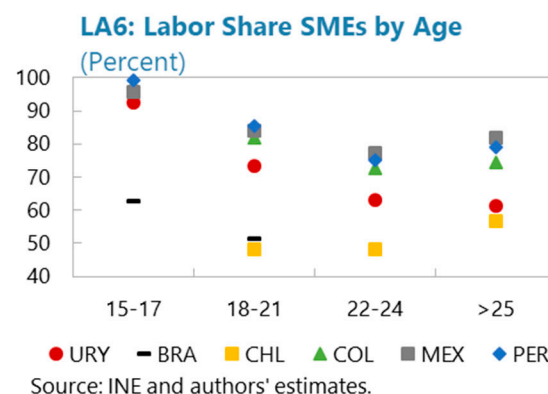
LA6: Youth Labor Share by Job Class (Percent)

Legend: Unskilled, Sales & Ser., Admin, Profes.

Source: INE.

Reasons Last Job Ended (Percent)

Legend: 15-17, 18-21, 22-24, >25

Categories: Dismissal, Study, Other (Resign), Harvest Over
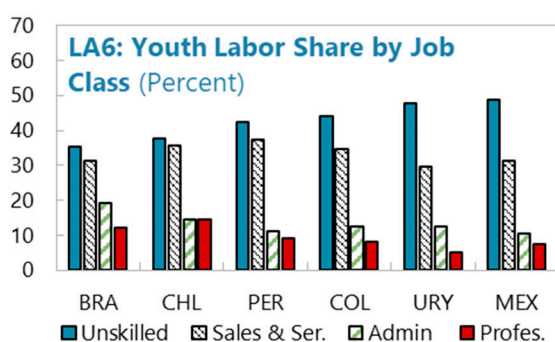
Source: INE and authors' calculations.

Category of Main Job (Percent)

Legend: Old, Young

Categories: Domestic Worker, Public, Self-Emp (No Invest.), Self-Emp (With Invest), Private

Source: INE.

LA6: Labor Share SMEs by Age (Percent)

Legend: URY, BRA, CHL, COL, MEX, PER

Source: INE and authors' estimates.

deteriorated and is three times higher than the headline number. In fact, Uruguay is in the 90th percentile of the global distributions of both the youth/adult ratio and youth unemployment.[3]
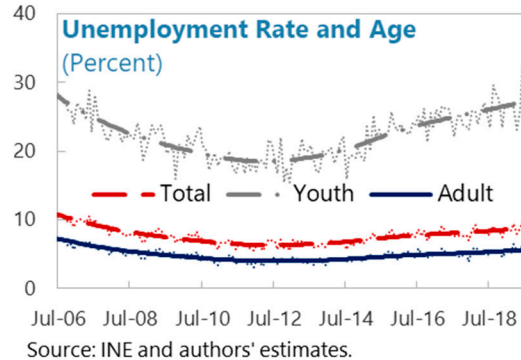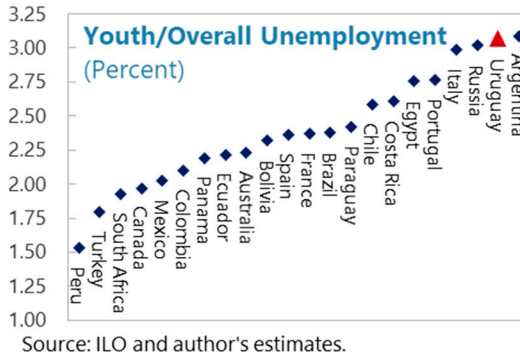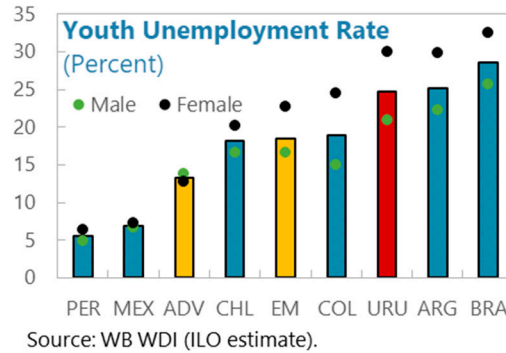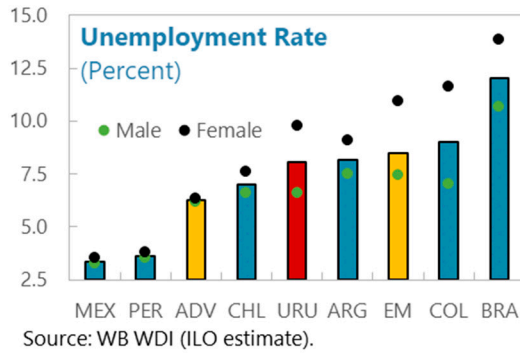
6.   Young Uruguayans face more vulnerable employment conditions relative to those in other Latin American countries. Young workers across the region mostly occupy temporary, low-quality and unskilled jobs, such as machine operators in agriculture or sales and service representatives in the hotels and restaurants sector. However, the prevalence of these jobs among youths is especially high in Uruguay and Mexico. Notably, nearly 50 percent of youths in Uruguay are hired on temporary/seasonal contracts. Moreover, their contracts are largely informal and concentrated in small and medium-sized firms, which commonly lack employee benefits.[4] Since small and medium firms have a higher failure rates (as they are less likely to overcome a negative shock), they experience higher job losses and labor turnover relative to larger firms (Edmiston, 2007).

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[3] In fact, Brazil, Italy, Spain and South Africa have higher youth unemployment than Uruguay but this is partly explained by a higher overall unemployment. Whereas in Italy, Portugal, Argentina, and Uruguay youth unemployment is high although the headline number is relatively low.

[4] Youths are also much less likely to work for the government where employee benefits are usually higher relative to private firms. This further limits their opportunity to receive employment protection.
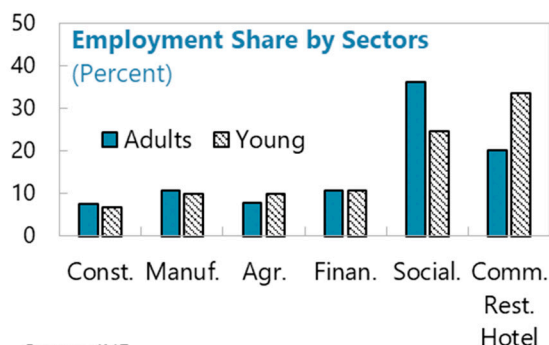
Source: WB WDI (ILO estimate).

Source: WB WDI (ILO estimate).

Source: ILO and author's estimates.

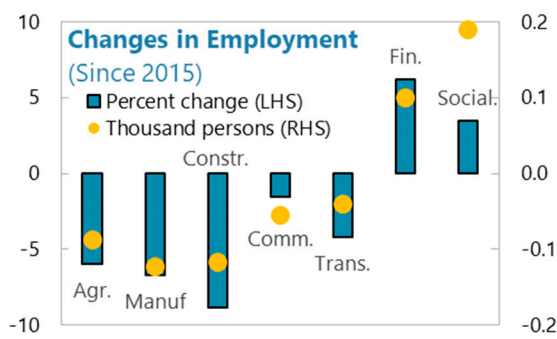Source: INE and authors' estimates.

7.   Youth unemployment appears highly sensitive to economic conditions, particularly during downturns. Extending (Ball, Leigh, & Lougani, 2017) Okun's law estimates, we find that the sensitivity of unemployment to the business cycle declines with age and is especially elevated for the young. For example, the left figure shows that in Uruguay the pseudo-elasticity of unemployment to GDP growth is about -0.6 for people aged 18–21 and only -0.2 for persons over 30. This occurs because young Uruguayans tend to work in cyclically sensitive sectors and in small firms, which makes their employment less stable. We then analyzed if the sensitivity differs in expansions or downturns. We still find that the sensitivity falls with age but interestingly, the figure on the right shows that in Uruguay the sensitivity is higher during downturns. This could signal the presence of downward wage rigidity, where firms find it more difficult to cut wages than increase them, and thus they mostly reduce employment in downturns and instead increase wages in expansions (Aiyar & Voigts, 2019).

Source: INE and authors' estimates.

Source: INE and author's estimates.
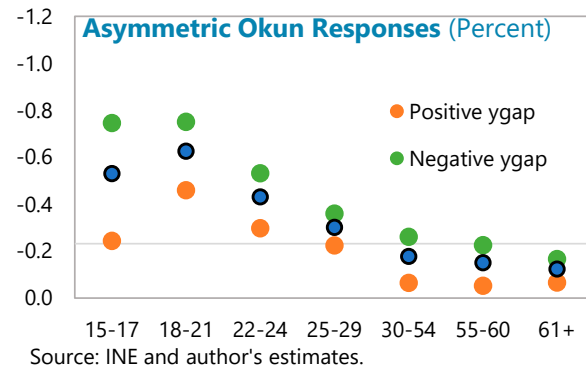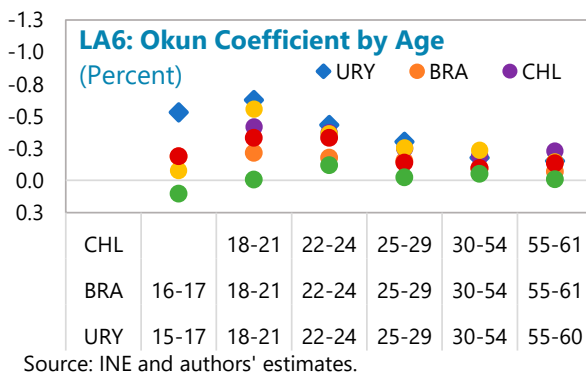
8.   Job losses have been more pronounced in sectors with a high proportion of young workers. For instance, youth employment is mostly concentrated in commerce, hotels and restaurants and social services, but finance, agriculture, manufacturing and construction are also important. Whereas notably, agriculture, manufacturing and construction sectors have shed between 5 to 10 percent of workers since 2015. It should be noted however, that differentiated labor losses across sectors is not only the result of cyclical conditions but may also reflect technological shifts (as in agriculture) or competitiveness issues (as in manufacturing).
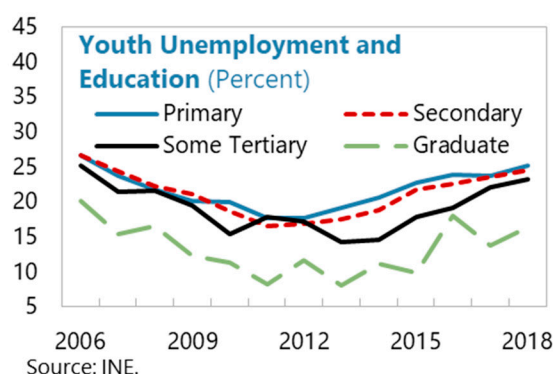
Employment Share by Sectors (Percent)
Adults Young
Const. Manuf. Agr. Finan. Social. Comm. Rest. Hotel
Source: INE.

Changes in Employment (Since 2015)
Percent change (LHS)
Thousand persons (RHS)
Fin. Social. Constr. Comm. Trans. Agr. Manuf
Source: INE authors' estimates.

9.   Even well-educated young experience high unemployment rates. In fact, the unemployment rate of the highly educated young is more than three times higher than the rate for adults with little education. This implies that for the young, a formal education is not enough to secure a job in Uruguay and thus there might be a role for further vocational training efforts.[5]

Youth Unemployment and Education (Percent)
Primary Secondary
Some Tertiary Graduate
2006 2009 2012 2015 2018
Source: INE.
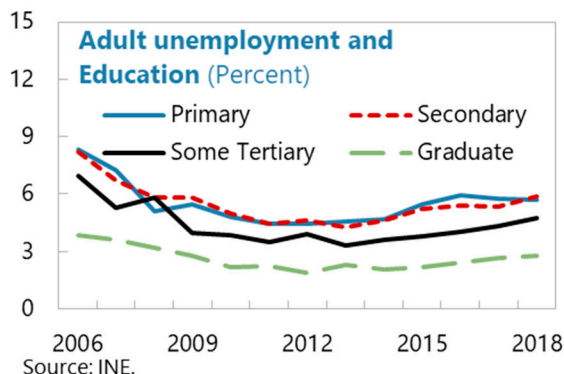
Adult unemployment and Education (Percent)
Primary Secondary
Some Tertiary Graduate
2006 2009 2012 2015 2018
Source: INE.

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[5] For example, (Baneriji, Saksonovs, Lin, & Blavy, 2014) find that in OECD countries vocational training lowers youth unemployment by around 0.3 percentage points.

C. Estimation and Results

10. **We estimate a reduced-form unemployment equation to investigate the determinants of high youth unemployment in Latin America.[6]** We construct a synthetic panel (Deaton, 1985) for LA6 countries from repeated household surveys between 1990–2018. The dataset contains over 900 observations per country organized into 56 cohorts defined by age, gender and educational attainment.[7] The determinants of unemployment are analyzed with equation (1) using a random effects estimator:

$$u_{ct} = \alpha + \beta Y_t + \theta_c age_c + \Theta_c X_{ct} + \varepsilon_{ct} \qquad (1)$$

where u_{ct} is the unemployment rate in cohort c in time t, Y_t is the log of real GDP in time t, age_c refers to the age of cohort c, X_{ct} is a vector of cohort-specific effects such as marital status, education, region, gender and ε_{ct} is a zero-mean error.

11. **The effect of age on unemployment is heterogenous across countries.** The unemployment rate decreases progressively with age (except in Mexico), with the largest decline occurring for prime-aged adults (30–54). However, the age effects are larger in Uruguay. In Uruguay, education has a significant impact on the aggregate unemployment rate, particularly at higher levels of education. Relative to the average cohort (with primary education) and conditional on other demographic factors, individuals with some tertiary and graduate level education have lower unemployment rates by 5 and 8 percentage points, respectively. Interestingly, when we control for education and other demographic characteristics, the effect of GDP is no longer significant or has the wrong sign.[8]

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[6] As far we know, this is the first paper to examine the reasons for dual labor market conditions between the young and adults. Previous related studies have employed difference-in-difference techniques to determine labor reallocation impacts or worker turnover from institutional reforms in European countries (such as Hijzen, et al. 2017; Bassanini and Garnero, 2013; and Centeno and Novo, 2012).

[7] There are seven age groups (15–17; 18–21; 22–24; 25–29; 30–54, 55–60 and 61 and over) and four educational levels (primary, secondary, some tertiary and graduate level).

[8] This might imply that age is highly correlated with other characteristics which are not controlled in the single-equation estimates of Okun's Law. This result remains if we replace the GDP growth with the output gap (as in the Okun law estimates).

	URY	BRA	CHL	COL	MEX	PER
18-21	-0.06**	-0.07***		0.04*	0.01	-0.03*
22-24	-0.15***	-0.15***	-0.06***	-0.03	-0.003	-0.06***
25-29	-0.22**	-0.20***	-0.12***	-0.07**	-0.02	-0.08***
30-54	-0.26***	-0.26***	-0.18***	-0.12**	-0.03*	-0.12***
55-60	-0.28***	-0.27***	-0.19***	-0.13**	-0.03	-0.11***
61+	-0.29***	-0.27***	-0.19***	-0.14***	-0.04***	-0.12***
secondary	-0.02	-0.02	-0.01	0.04	0.02	0.01
some tertiary	-0.05***	-0.04	-0.02	0.05	0.02	0.04*
graduate	-0.08***	-0.06	-0.03	0.05	0.06***	0.02
male	-0.05***	-0.03***	-0.03***	-0.03***	0.03*	-0.01
urban	0.15***	0.24	0.14***	-0.26**	-0.08*	0.12***
married	-0.05	0.12***	0.03	-0.03	-0.06***	0.00
GDP	-0.01	0.05***	0.03***	-0.14***	0.02	-0.03***
constant	0.36**	-0.69**	-0.50***	3.28***	-0.13	0.38***
R²	0.73	0.73	0.63	0.60	0.34	0.43

Note: ***, ** and * indicates significance at 1%, 5% and 10% level, respectively.

12.   The Uruguayan labor market has special characteristics that cannot be explained with standard variables. About 40 percent of Uruguayan unemployment cannot be explained with the controls from equation (1).[9] For example, the unemployment of persons age 15–17 is 37 percent, which is 15 percentage points higher than would be expected if the persons from this age group lived in the average LA5 country. The unexplained portion falls with age and thus a large fraction of the

Unemployment Decomposition (Percent)

Source: INE and authors' estimates.

youth-to-adult gap in Uruguay remains unexplained. For example, the unemployment rate of persons aged

15–17 is 30 percentage points higher than for those older than 25, of which 17 percentage points can be attributed to the difference in their characteristics and 13 percentage points remain unexplained (the unexplained portion falls to 9 and 6 percentage points for those aged 18–21 and 22–24, respectively). This opens the possibility that other factors, including labor market institutions, might be at play. Ideally, the statistical significance and robustness of this possibility should be

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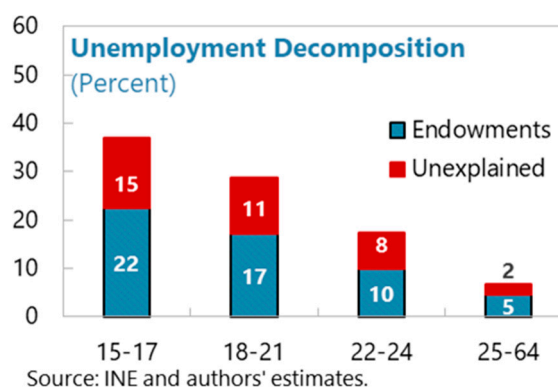
[9] The explained and unexplained portions are estimated using a Oaxaca-Blinder decomposition, which breaks unemployment differentials per age group between Uruguay and a pooled sample of LA5 countries into differences in endowments and returns. The latter is often interpreted as a measure of labor market discrimination (Jann, 2008). Thus, the explained portion is the unemployment rate that would be expected given Uruguayan endowments per age group if the returns to those characteristics were the same as in the average LA5 country.

analyzed by adding various labor-market indicators as covariates to the regression. However, due to data limitations (limited data points), this association cannot be formally tested.

D.   Conclusion

13.   Youth unemployment is exceptionally high in Uruguay. In addition, unemployment is higher for lower education levels, and the young are especially concentrated in temporary low-quality jobs. Standard control variables such as marital status, education, region, gender, and the economic cycle cannot explain the gap between youth and adult unemployment. Further work is needed using more microlevel data and controlling for additional labor market characteristics to better understand the youth-adult unemployment gap.

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