



ALLIANZ RESEARCH

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EXECUTIVE SUMMARY



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Even before the pandemic, the pension systems of most Latin American countries ranked in the bottom third in international comparison of their long-term adequacy and sustainability in our last Global Pension Report. The Covid-19 pandemic has been a double blow with respect to pension systems' adequacy: On the one hand, rocketing unemployment rates diminished the share of the labor force in formal employment that is covered by pension schemes; on the other hand, lower contributions to pension schemes, and the fact that some governments allowed savers to tap into their retirement funds, shrank the future pension pots.

By relieving some of the pressure on the state budget to finance state welfare in the short run, the region could see three negative consequences: higher pension inequality, a higher prevalence of old-age poverty and a higher share of the elderly who depend on tax-financed state welfare in old-age in the long term. As a result, the Covid-19 crisis will cast a long shadow over Latin America in the decades to come.

In addition, life expectancy declined only temporary due to Covid-19 and will certainly resume its upward trend. Combined with declining fertility rates, this development will lead to rapidly increasing old-age dependency ratios. In Brazil, for example, the ratio is set to almost treble to 36.2%.

The results of our Allianz Pension Indicator, which assesses how prepared global pension systems are for demographic change, show that despite some recent reforms, the sustainability and adequacy of Latin America's pension systems have hardly changed within the last two years. They still range in the lower half of the ranking, with the overall assessments ranging between 3.5 and 4.3 on a scale from 1 (best) to 7 (worst) since the effects of some reforms point in different directions with respect to sustainability and adequacy, like Mexico's decision to increase the pension benefit level, for example, or were too cautious to move the needle, like the increase of the retirement age in Brazil.

Covid-19 has affected all countries, confronting pension systems around the world with great challenges. As a result, reactions such as the early withdrawal of pension assets could be seen across the board. Latin American pension systems are at a crossroads. Therefore, the need to reform pay-as-you-go financed pension systems – making them more adequate without losing sight of long-term sustainability – is as urgent as ever.



>4 millions

Chileans depleted their pension funds due to the Covid-19 pandemic

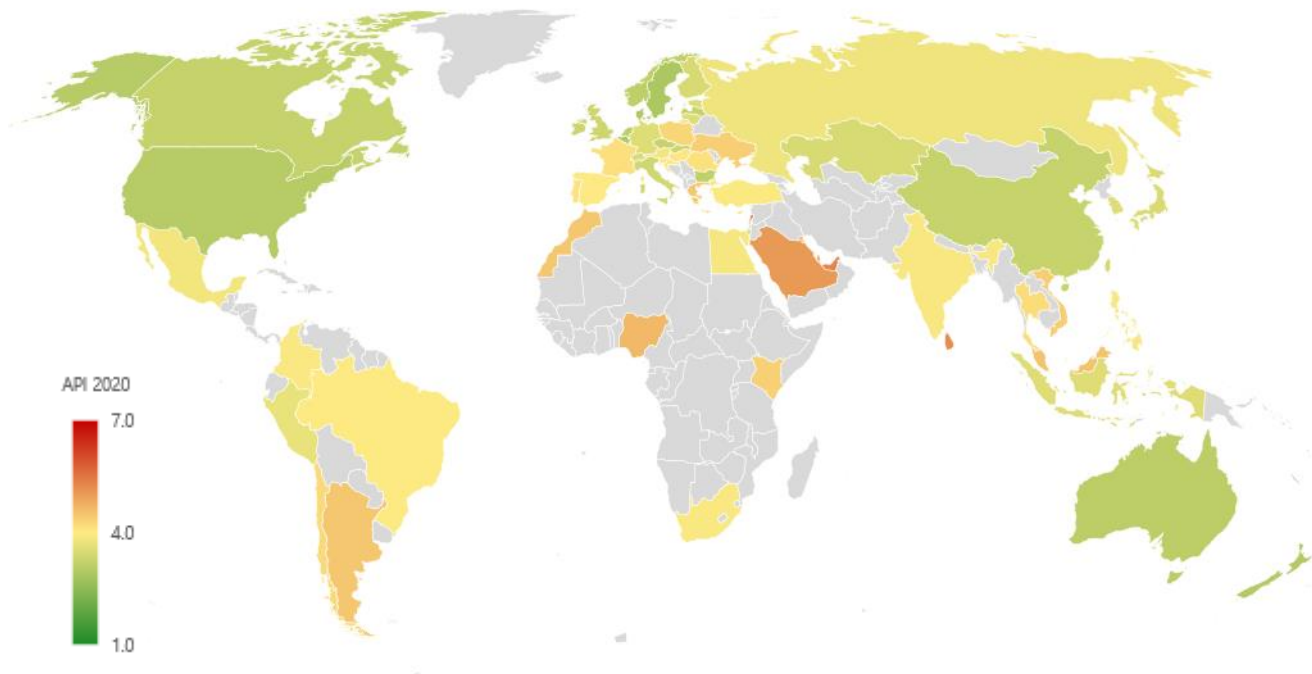
COVID-19'S LONG-TERM EFFECT ON LATIN AMERICA'S PENSION SYSTEMS

On the 2020 Allianz Pension Indicator (API) world map, the Latin American continent shimmered in yellow and orange rather than green, suggesting that its pension systems are poorly prepared for demographic change. In our analysis of six countries (Argentina, Brazil, Chile, Colombia, Mexico and Peru), the overall scores ranged from 3.7 in Peru to 4.5 in Argentina (on a scale from 1 (best) to 7 (worst)). The low coverage of pension systems

and low benefit levels due to the high share of informal labor in many countries, as well as low retirement ages, weighed on the overall ranking as these factors are decisive for the adequacy and long-term sustainability of a pension system (see Figure 1). Since then, some countries have introduced pension reforms. Brazil's government, for example, increased the retirement age, while the Mexican government decided to adjust the

minimum contribution period and contribution rates in order to strengthen the adequacy and sustainability of its pension system. However, these reforms might prove to be insufficient due to the rapid aging of societies. And even more importantly, these policies do not address the main Achilles heel of Latin America's pension systems: low coverage due to comparatively high shares of people working in the informal labor market.

Figure 1: Allianz Pension Indicator 2020



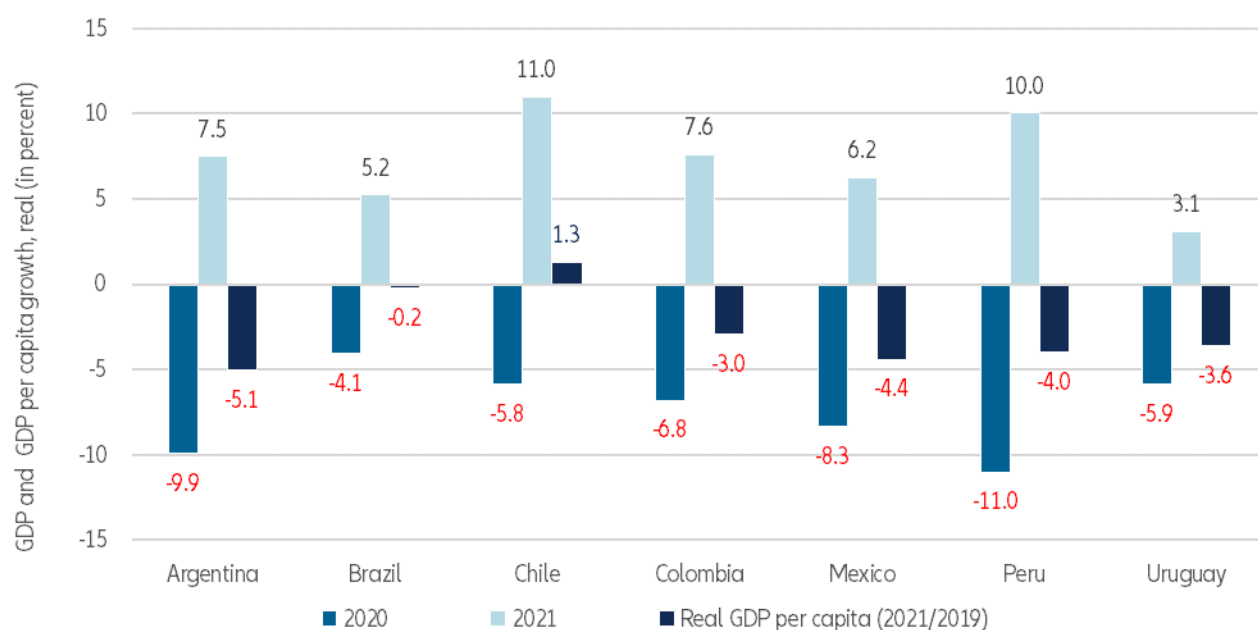
Note: With support from Bing; ©Australian Bureau of Statistics; GeoNames; Microsoft; Navinfo; OpenStreetMap; TomTom; Wikipedia

Adding insult to injury, in the last two years, the Covid-19 pandemic plunged many Latin American economies into the deepest recession since the region's debt crisis of the early 1980s, with a much stronger economic impact than the Great Financial Crisis in 2009, erasing millions of jobs. The economic downturn in 2020 ranged from -11.0%

in the hardest-hit country, Peru, to -4.1% in Latin America's most populous country, Brazil. All countries that we cover in our report witnessed a marked economic downturn in the first year of the pandemic followed by a V-shaped recovery in 2021. Yet, in most countries, the impressive growth in 2021 could not compensate for the previous year's

decline. Real GDP per capita was still below 2019 levels in all countries besides Chile, where the economic upswing resulted in GDP per capita that was 1.3% above pre-crisis levels. In Brazil, GDP per capita was -0.2% below pre-crisis levels, but in Argentina, the difference was still -5.1%¹ (see Figure 2).

Figure 2: The Covid-19 pandemic hit Latin America's economies harder than the financial crisis



Source: IMF.

In the wake of the economic downturn, unemployment rates shot up to double-digit levels in all countries we studied, except Mexico. The age groups hit the hardest were those just entering the labor market and young adults. In Argentina, Brazil, and Chile, one in three graduates aged between 15 and 24 could not find a job. In the age group 25 to 34, the unemployment rates ranged between 13% in Argentina and 19% in Colombia². Unemployment rates in the higher age groups almost

doubled during the second and third quarter of 2020 compared to pre-Covid figures, though on slightly lower levels (see Figure 3, page 6).

Unlike in previous economic crises, the Covid-19 crisis hit all sectors so people who lost work in the formal labor market were unable to find a job in the informal sector, forcing them to simply drop out of the labor market. The same held true for informal workers, who were often employed in smaller enterprises with low capital buffers and less

access to state support measures³. This is reflected in a marked decline of the labor force participation rates in the age group 25 to 54 in all countries in 2020, except for Uruguay, where it remained close to 90%. Peru saw the strongest decline, with a drop by almost 10pp from 87.6% to 78.7%. The other countries recorded declines of around 5pp, with participation rates ranging from 70.4% in Mexico and 79% in Colombia⁴ (see Figure 4, page 6).

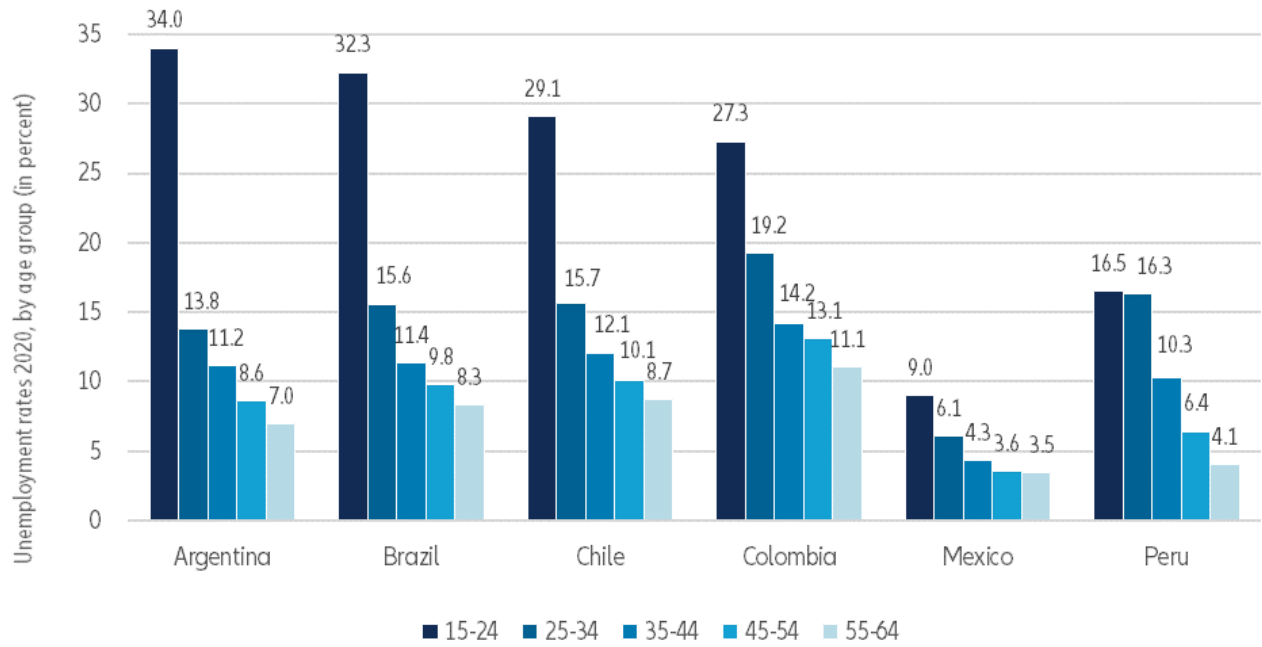
1 IMF (2021): *World Economic Outlook database*, October 2021.

2 See ILO. In Uruguay the unemployment rate among 15- to 24-years-olds was 28.2% before the outbreak of the pandemic. See ILOSTAT.

3 See ILO (2022), p. 53.

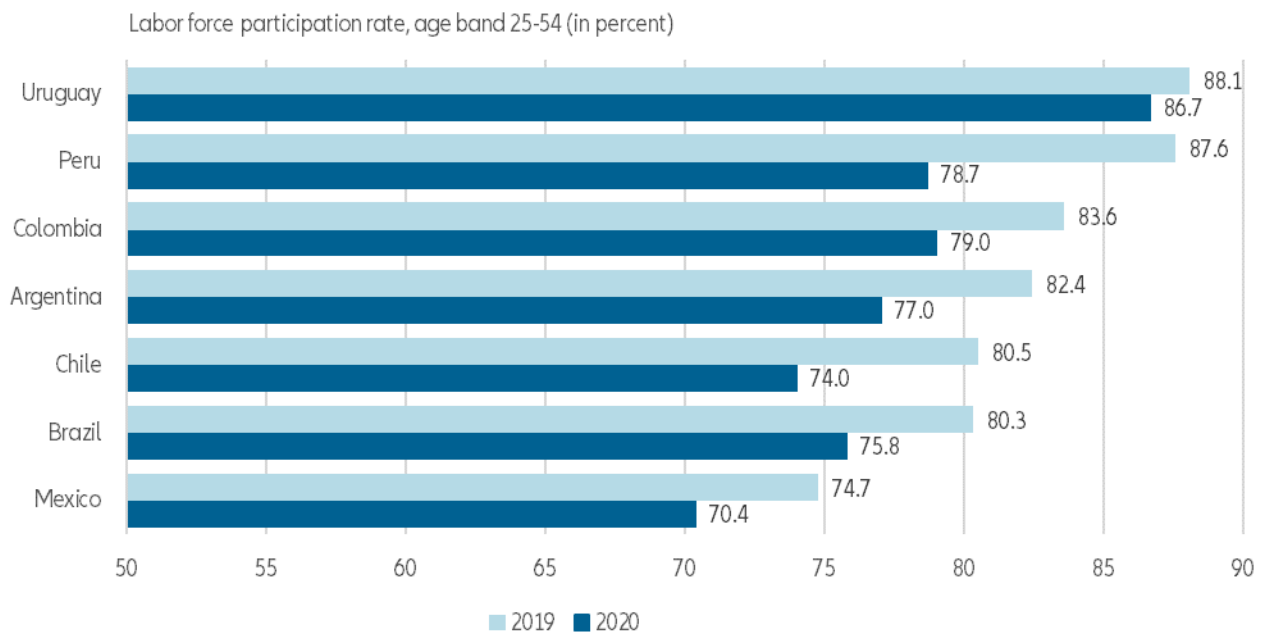
4 See ILO (2022), ILOSTAT.

Figure 3: High unemployment rates among younger age groups



Source: ILO.

Figure 4: Marked decline of the labor force participation rates in 2020

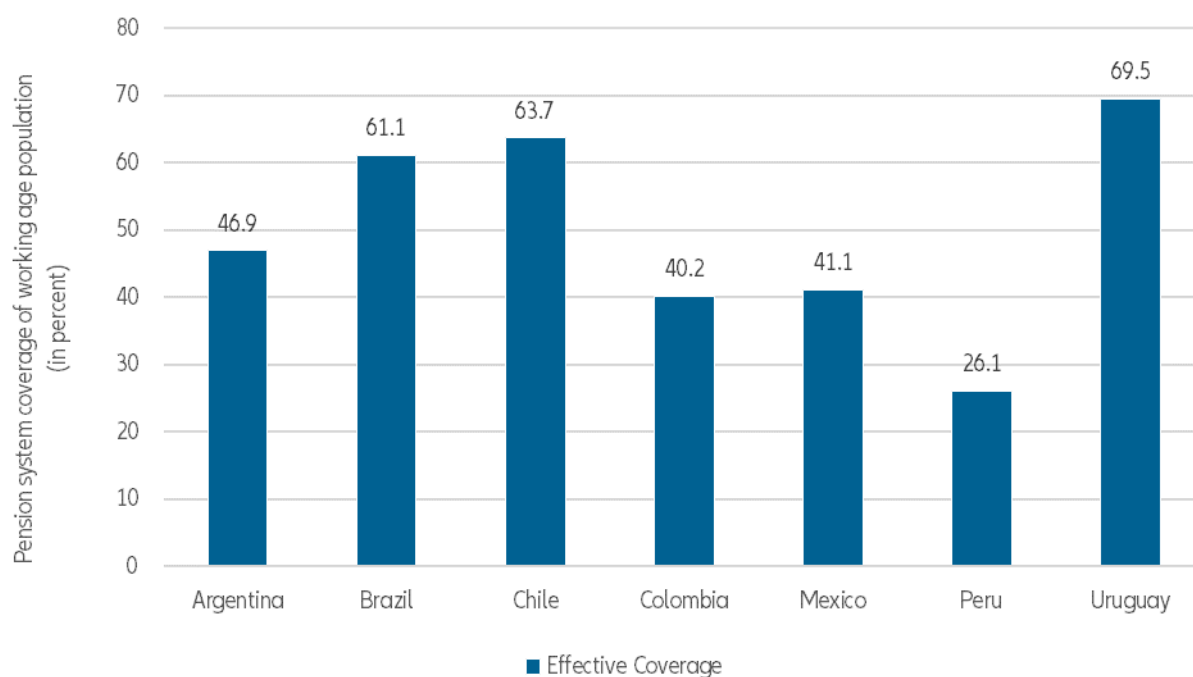


Source: ILO.

Though the labor market situation slightly improved during 2021, unemployment rates were still higher than at the end of 2019. In Colombia, the unemployment rate in autumn 2021 (13.9%) was still almost 50% higher than before the Covid-19 outbreak. In the other countries, the latest unemployment figures (Q3 2021) are between 1pp (Mexico) and 2pp (Peru) higher than the pre-pandemic levels. Even worse, according to International Labour Organization estimates and statistics of the Central Bank of Mexico, the decline of unemployment rates is mainly due to the creation of informal jobs. These have accounted for over 70% of net job creation since mid-2020 in Argentina, Mexico and Peru, and for over half of job growth in Chile⁵. Yet if governments fail to succeed in

broadening the formal labor market, this implies that a growing share of the working-age population has no access to the pension system. The effective coverage of pension systems in Latin America is at best mediocre compared to the rest of the world, with coverage ratios ranging from 26% in Peru to 40% in Colombia and Mexico, roughly 60% in Brazil and Chile and 70% in Uruguay. For comparison, in most Western European economies, this ratio is close to 90%⁶ (see Figure 5).

Figure 5: Low coverage of pension systems across Latin America



Source: ILO.

⁵ See ILO (2022), p. 53f. and Banco de Mexico (2021): *Informe trimestral, Octubre – Diciembre 2020*, p. 42.

⁶ See ILO (2022) Dashboard.

To ease the economic hardships caused by the lockdowns and increasing unemployment during the pandemic, some Latin American countries allowed early withdrawals of pension assets as these were often the only savings large parts of the population had⁷. This applied first and foremost to those markets which in the past started to build capital-funded pillars within their pension systems, namely Chile

and Peru. The alternative would have been to grant temporary tax-financed subsidies to the unemployed or underemployed. The timing couldn't have been worse: Many people who withdrew pension funds in the first half of 2020 locked in the temporary losses that were caused by the stock market downturns. Due to the combination of stock market downturns and withdrawals, in Chile and Peru, private

households' total insurance and pension fund assets declined by -3.8% and -5.8%, respectively. At the end of 2020, retirement savings in Chile amounted to 100% of GDP or EUR12,100 per capita. In Peru, they had declined to EUR1,120 per capita, corresponding in total to 23% of the country's GDP⁸ (see Figure 6).

Figure 6: Retirement savings per capita and portfolio structure, 2020



Sources: Allianz Global Wealth Report 2021, Central Bank of Uruguay, IMF, Refinitiv, UN Population Division.

⁷ See Inter-American Development Bank (2020)

⁸ See [Allianz Global Wealth Report 2021](#)

However, these developments only dampened the absolute growth of private households' total financial assets as life insurance and pension fund assets had accounted for only 56% of Chile's and 41% of Peru's private household total financial assets before the pandemic. Other asset classes, especially bank deposits, grew at double digit rates⁹.

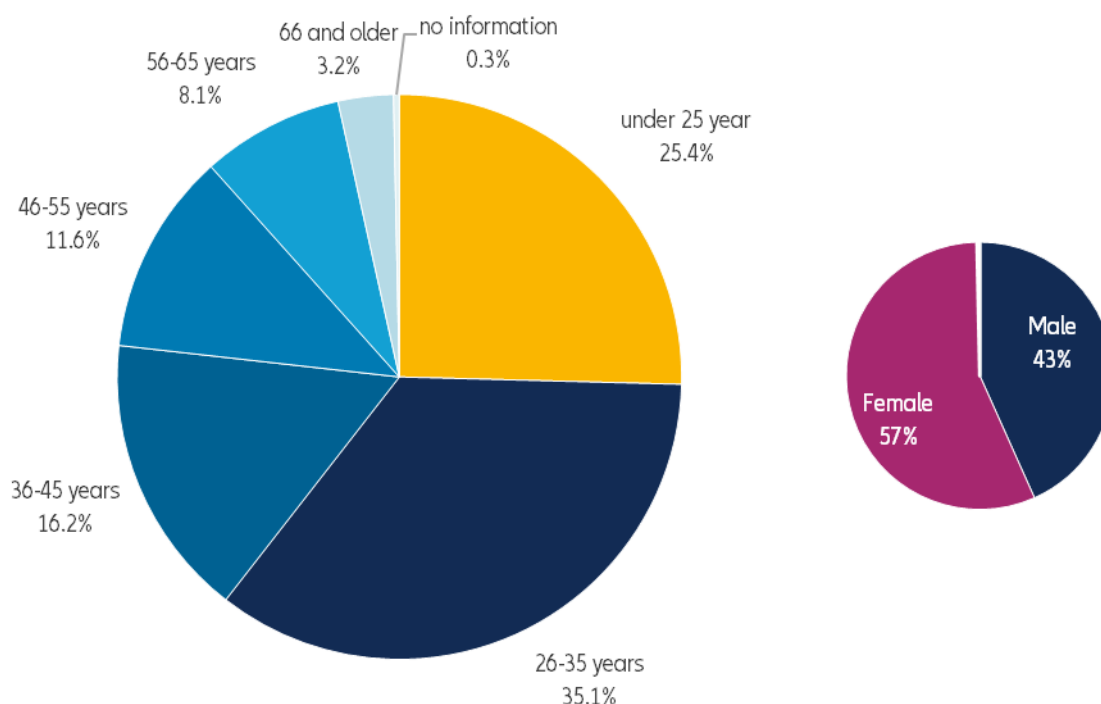
As a result, the effects on pension equality and pension levels will only be felt in the long run. Especially as the governments of Chile and Peru allowed further withdrawals in 2021 due to the still tense labor market situation. As expected, the "offer" was mainly taken

up by households that struggled to make ends meet in the first place, i.e., by poorer households. In Chile, for example, it has mostly been women who have exhausted their pension accounts (56.4%). More worryingly, 60% of those who depleted their pension accounts were younger than 35 years, and 16.2% aged between 36 and 45¹⁰. At the end of 2021, more than 4mn Chileans, or 38.5% of the pension fund members, were left without any savings in their pension accounts¹¹ (see Figure 7).

In Peru, 5.7mn members, 61% of them male, have so far made use of the offer and have in total withdrawn pension funds corresponding to EUR14.9bn

between 2020 and October 2021¹²; an estimated 2.1mn of these members (37%) have depleted their funds completely. All in all, accumulated balances of individual accounts declined by up to -24.5% in Peru, mainly affecting workers close to 40 years of age, who will not have enough time to restore their funds¹³. Furthermore, in contrast to Colombia, Mexico and Uruguay, where the pension funds' assets under management have markedly increased since the outbreak of the pandemic, pension funds' assets under management are still below 2019 levels in Chile and Peru¹⁴.

Figure 7: In Chile, most savers who depleted their account were female or younger than 35



Source: Superintendencia de Pensiones Chile.

⁹ In 2020, Chilean private households' bank deposits increased by 44.8%, in Peru they increased by 22.5%. See [Allianz Global Wealth Report 2021](#).

¹⁰ See Superintendencia de Pensiones (2021).

¹¹ See Superintendencia de Pensiones (2021).

¹² See Superintendencia de Banca, Seguros y AFP de Peru (2021).

¹³ See Federacion Internacional de Administradoras de Fondos de Pensiones (FIAP) (2021).

¹⁴ See Federacion Internacional de Administradoras de Fondos de Pensiones (FIAP) (2021).

This weighs heavily in countries where most people depend on pension savings in old age, and it is going to have a lasting effect on future pension payouts. It is estimated that the average reduction in the accumulated balance in personal accounts of 23% in Chile is set to translate into a reduction of between 15% to 18% in future pensions for women, and between 10% and 13% for men, thus adding to pension inequality in old age¹⁵. Given the still high unemployment rates, many of them will not be able to close these financial gaps before they enter retirement and even younger cohorts will have to struggle to save enough. To demonstrate with a

simple example: A 25-year-old who would like to retire at the age of 65 and have 60% of his or her last income during retirement must contribute 15% of his/her wage to a pension-savings product with an annual return of 5% during his or her working life. In fact, the amount that is saved in the first 15 years in this case accounts for 44% of the savings at retirement due to compound interest rate effects. If he or she starts to save 10 years later, at the age of 35, the yearly contribution increases to 23% and a 45-year-old who has depleted his/her pension funds would have to save 38% of his/her annual income to save the necessary amount in the remaining 20 years until retire-

ment¹⁶. Clearly, a rising share of the elderly is set to depend on tax-financed state welfare in old age. In this context, governments need to broaden the coverage of pension systems and to incentivize capital-funded pension provision, especially against the background of the rapid aging of societies.



¹⁵ See *Federacion Internacional de Administradoras de Fondos de Pensiones (FIAP) (2021)*.

¹⁶ We assumed an annual wage increase of 2% in the active phase and an average 2% inflation during the retirement phase. We assumed an average retirement phase of 20 years.

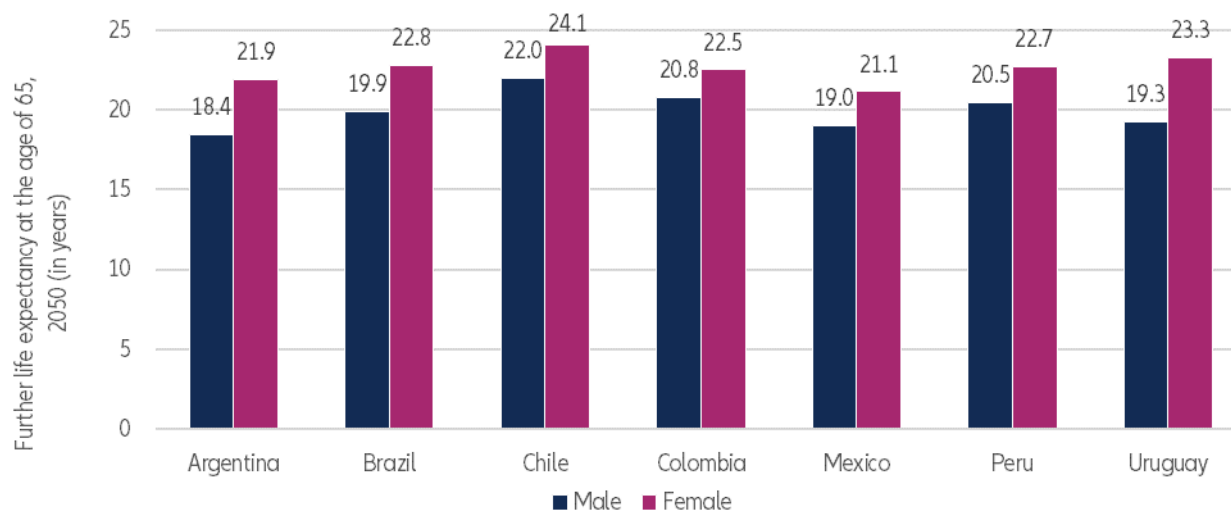
DEMOGRAPHIC CHANGE IS HERE TO STAY

The “pension pot plunder” mainly affects pension systems that have a strong capital-funded pillar, i.e., relatively high pension savings. Therefore, are pay-as-you-go financed systems better off? Far from it. The Covid-19 pandemic may have long-lasting economic impacts, but it did not alter the prospect of the looming demographic crisis. As Covid-19 caused millions of pre-mature deaths worldwide, many countries witnessed a decrease in average life expectancy. But this decline will only be temporary; life expectancy will continue to increase further due to medical advancements. The upshot: the number of people aged 65 and older is going to increase markedly within the next three dec-

ades in all Latin American countries. In Argentina and Chile, their number is set to almost double from 5.1mn today to 9.5mn in 2050, and from 2.3mn to 5.1mn, respectively. In Brazil, Colombia and Mexico, their number is expected to almost treble from 20.4mn to 52.0mn, from 4.6mn to 11.8mn and from 9.8mn to 26.4mn, respectively. In Uruguay, their number is going to increase from 0.5mn to 0.8mn. Most of the future 65-year-olds will spend more than 20 years in retirement, with the average further life expectancy of 65-year-old men then ranging from 18.4 years in Argentina and 22.0 years in Chile, and that of their female peers in Chile (see Figure 8).

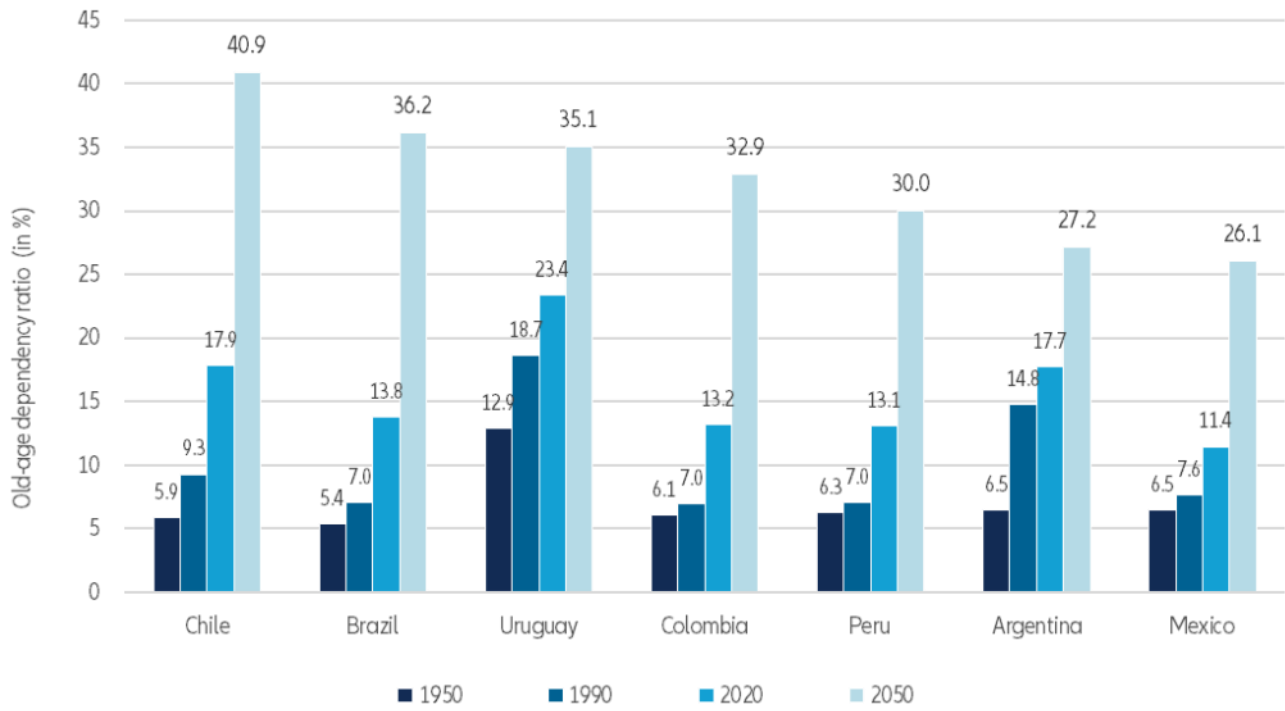
In combination with declining fertility rates, this development will lead to rapidly increasing old-age dependency ratios (people aged 65 and older per 100 persons in working age between 15 and 64). In most countries, this ratio will more than double: In Chile, it is expected to increase from 17.9% today to 40.2% in 2050. In Brazil, the ratio is set to almost treble to 36.2%. In Uruguay, Colombia and Peru, the rates are going to increase to 35.1%, 32.9% and 30.0%, respectively. Only Argentina and Mexico are expected to see the old-age dependency ratio remain below the 30%-threshold, with 27.2% and 26.1%, respectively (see Figure 9, page 12).

Figure 8: The average pensioner is set to spend more than 20 years in retirement



Source: UN Population Division.

Figure 9: Until 2050, the old-age dependency ratios are set to increase markedly



Source: ILO.



FURTHER PENSION REFORMS STILL NEEDED

Against the backdrop of rapidly aging populations, turning back to solely pay-as-you-go financed pension systems is not an option. Governments are faced with the challenge of making their pension systems more adequate without losing sight of long-term sustainability and vice versa. As most Latin American countries have backlog demand in both aspects, the question is, have recent reforms and developments changed their overall assessment compared to the rest of the world?

To gauge the impact of a once-in-a-lifetime economic crisis, ad-hoc withdrawal measures, unchanged demographic prospects and some reforms, we apply the logic of our Allianz Pension Indicator (API). This allows us to get a more comprehensive view on the impact of the external and internal changes on the long-term adequacy and sustainability of pension systems, while also taking into account the unique demographic and economic

starting situation of each country. In doing so, we compare the results of the Allianz Pension Indicator 2020 with the result of the recent ranking. To put it mildly, the financial and demographic starting situations of most countries have not improved during the last two years: While the demographic outlook has remained unchanged, state finances and thus the financial leeway to finance potential future pension deficits have further deteriorated due to the economic crisis.

However, as this holds true for most of the more than 70 countries that we cover in our Allianz Pension Indicator, the relative position and assessment of most Latin American countries with respect to their financial and demographic starting points has only slightly changed. Due to the further aging of societies within the last two years, the relative position of all Latin American countries in the sub-indicator demographic change, in which we take the development of the old-age depend-

ency ratios into account, deteriorated slightly. In fact, this is the only reason for the marginally lower score for Chile in this sub-indicator in comparison to the API 2020 results. The assessment of Argentina's and Brazil's starting positions was also influenced by the strong increase of the gross-government-debt-to-GDP levels. In both countries it climbed above 90%, reducing their future financial leeway markedly. The deterioration of Mexico's score was triggered by the increase of public spending for old age in the course of the pension reform, making Mexico an example of the sometimes-double-edged nature of reforms: What might be good for the adequacy of the system i.e., higher pension payments, can easily harm the long-term sustainability, and in this case the further financial leeway. In sharp contrast, Peru's assessment improved due to the fact that the country spent a lower share of its GDP for older persons than before (see Figure 10).

Figure 10: Financial and demographic starting points

	Result 2020	Result 2022
Argentina	3.5	3.7
Brazil	4.8	4.9
Chile	3.7	3.8
Colombia	3.7	3.7
Mexico	3.2	3.7
Peru	3.2	2.9

Source: Allianz Research.

Looking at the development of the sustainability of pension systems, the results are mixed: While Argentina, Chile, Colombia and Peru seem to have improved slightly, we observe a marginal deterioration in Mexico and Brazil. Especially in the case of Brazil this seems paradoxical as the country has increased the retirement age. However, our indicator shows that these reforms have not been strong enough.

To assess the impact of the retirement age on the sustainability of a pension system, we build the quotient of the length of working life, i.e. the time span from the age of 15 to the statutory retirement age, to the average time spent in retirement, i.e. the further life expectancy at the statutory retirement age. The higher the quotient the better, and ideally it should remain constant over time, reflecting the developments of further life expectancy. The gradual increase of the retirement age for women in Brazil has indeed improved the current work-life-to-retirement-phase balance markedly. Yet, with currently no further reforms planned, this ratio is set to decline in the future as the further life expectancy of an average Brazilian woman at the

age of 62 is expected to increase by 2.8 years until mid-century¹⁷. In order to keep this ratio constant, a further increase of the retirement age of women to 64 years would be necessary.

In the case of Mexico, it was again the reforms to improve the adequacy of the pension system that had a negative impact on the scores in this sub-indicator: the increase of the contribution rate and the halving of the minimum number of contribution weeks. The higher the contribution rate today, the smaller the potential leeway for further increases in the future as comparatively high contribution rates tend to reduce the international competitiveness of companies and the market attractiveness for qualified labor migrants. The lower the number of minimum required contribution periods, the greater the potential that a relatively high proportion of the working-age population stops making pension contributions before reaching retirement age once the required number of contribution periods is reached. Both factors have a negative impact on the long-term financial sustainability of a pension system.

The slight improvement of the assessments of Argentina, Chile, Colombia and Peru are owed to the mechanism of our pension indicator and are merely technical effects. As we measure the relative positions of the different countries, the thresholds and scores change with the changes in the underlying data compilation (see Figure 11).

Figure 11: Further reforms needed to improve the sustainability of the pension system

	Result 2020	Result 2022
Argentina	4.6	4.4
Brazil	4.3	4.4
Chile	4.6	4.4
Colombia	4.1	4.0
Mexico	3.1	3.2
Peru	4.0	3.8

Source: Allianz Research.

¹⁷ See UN Population Division (2019).

With respect to the adequacy of the pension systems, Latin American countries again moved in differing directions. In Latin America, like in many emerging economies, the development depends heavily on the coverage of the working-age population. In this respect, our data shows slight improvements in all countries besides Brazil, where the coverage has declined. However, it must be seen if these improvements have only been temporary as the developments in 2021 have not been fully covered in the statistics so far. There was also some progress with respect to the average benefit levels, which have increased in four countries. The marked improvement of Mexico's assessment in this sub-indicator is in fact owed to the rise of the pension benefit level in the recent reform.

The exceptions were Chile, where it remained unchanged, and Peru, where it had declined in comparison to our previous assessment, which triggered the decline of its ranking in the adequacy sub-indicator.

Yet, in all Latin American countries, there is still backlog demand with regard to the access to financial services and financial literacy. These factors gain in importance with respect to the necessary build-up of supplementary capital-funded pension pillars in aging populations. The positive development of the private household net-financial-assets-to GDP ratio in all countries overlays these pending reform needs. It also masks the massive early withdrawals of pension funds and retirement savings in Chile and Peru as losses in this asset class were compensated by the high increases of bank

deposits and securities. Besides, the actual net-assets-to GDP ratios might be distorted upwards due to the drop in GDP in the course of the crisis (see Figure 12a).

The overall results reflect the diverging developments in the sub-indicators. The scores for Argentina, Chile and Mexico improved, mainly thanks to the progress with respect to the adequacy of their pension systems. While the score of Colombia remained unchanged, those of Brazil and Peru deteriorated slightly. This reflects the high indebtedness and the need for further adjustments of the retirement age in the case of Brazil, and the decline of the adequacy of the pension system outweighing the improvements in its sustainability in the case of Peru (see Figure 12b).

Figures 12 a + b: Diverging developments of pension systems'

	Result 2020	Result 2022
Diverging developments of pension system's adequacy		
Argentina	4.6	4.5
Brazil	3.2	3.4
Chile	4.1	3.8
Colombia	3.8	3.8
Mexico	4.3	3.6
Peru	3.7	4.3

	Result 2020	Result 2022
Argentina	4.5	4.3
Brazil	4.0	4.1
Chile	4.2	4.1
Colombia	3.9	3.3
Mexico	3.8	3.5
Peru	3.7	3.8

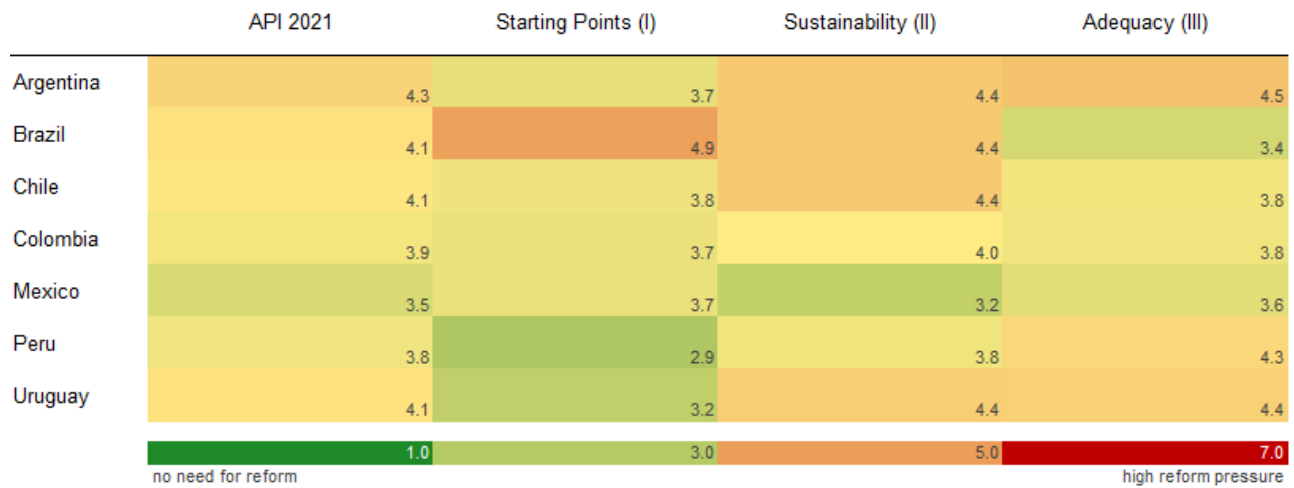
Diverging directions in the development of the pension systems, with Mexico replacing Peru as the country with the top-ranking pension system in the region.

The bottom line: The fact that there is some mottled green between the yellow and orange should not distract from the urgent need for further reforms to improve the sustainability and

adequacy of the pension systems in Latin America. The overall results are still rather mediocre, ranging from 3.5 in Mexico to 4.3 in Argentina on a scale from 1 to 7. The challenge will be to

find the right balance between improving sustainability without threatening the adequacy of the pension system and vice versa (see Figure 13).

Figure 13: Assessment of Latin American pension systems



Source: Allianz Research.



Appendix I: Allianz Pension Indicator (API)

Starting Points	20%	Living Standards	40%	Prosperity	50%	GDP p.c.		LE at birth				
						50%	50%					
			30%	Health	Health exp. ODPs		HALE		Share of population reaching age of 65 (male)	Share of population reaching age of 65 (women)		
		35%			35%	15%	15%					
		20%	Progress	Urbanization		Internet users		Employment in Agriculture				
				40%	40%	20%						
Finances and Demography	60%	Financial Leeway	40%	Budget Deficit		Public Spending for Old Age						
				30%	70%							
		Demographic change	60%	OADR 2020		OADR 2050		Change 2020-2050				
10%	40%			50%								
Sustainability	40%	Preconditions	60%	Retirement Age (Men)	40%	MC/TSIR (2020)		MC/TSIR (2050)		Change MC/TSIR (2020 - 2050)		
						10%	40%	50%				
				Retirement Age (Women)	40%	MC/TSIR (2020)		MC/TSIR (2050)		Change MC/TSIR (2020 - 2050)		
			10%			40%	50%					
			Minimum Contribution Period	20%	(MCP) Men		MCP (Women)					
					50%	50%						
		Finances	40%	Financing	70%	Financing Method		Contribution rates				
						25%	75%					
Pension Formula	30%	Early Retirement Deductions		Demographic Factor?								
		50%	50%									
Adequacy	40%	First Pillar	50%	Coverage	70%	Coverage 65+		Legal coverage (working age population)		Effective coverage (working age population)		Obligation?
						30%	0%	60%		10%		
			Benefits	30%	Gross Benefit Ratio		Minimum Pension					
					80%	20%						
		Other Pension Income	50%	Second Pillar	20%	Financing Method		Obligation?				
						80%	20%					
			Financial Assets	70%	Access to Financial Services		Old-age as Savings Motive		Private HH Net Financial Assets		Gini Coefficient	
					30%	10%	30%		30%			
Gainful Employment	10%	Activity ratio 65+ (M)		Activity Ratio 65+ (W)								
		50%	50%									

Appendix II: Methodology of the Allianz Pension Indicator (API)

The Allianz Pension Indicator (API) consists of three pillars, which are differently weighted (respective weightings in brackets):

- Basic Conditions (20%)
- Sustainability (40%)
- Adequacy (40%)

These three pillars are based on six categories and fourteen sub-categories, taking into account in total 37 parameters. Each parameter value is rated on a scale of 1 to 7, with 1 being the best grade. The bands defining each parameter's grade are chosen in a way that the grading results of all markets are normally distributed. This implies a relative judgement. By adding up all weighted subtotals, the API assigns each market a grade between 1 and 7, thus providing a comprehensive view of the sustainability and adequacy of the pension system of a respective market compared to other markets.

The pillars in detail

The pillar **Basic Conditions** takes into account the living standards as well as the financial and demographic starting points, which are two major exogenous factors determining the framework and effecting the need for further pension reforms:

- Living standards (40%)
Living standards are mainly determined by the overall prosperity level (50%), the access to health services (30%) and the level of progress (20%) of a society.
- Finances and Demographics (60%)
Financial leeway (40%) and demographic change (60%) determine the need for pension reforms.

General government gross debt and nominal GDP data are extracted from the IMF World Economic Outlook database. The source of the public spending for old age data is mainly the International Labor Organization, supplemented with data from national statistical offices and public-pension insurance providers. All population data is derived from the UN World Population Prospects database, and the main data source to determine the living standards is the World Bank World Development Indicators.

The pillar **Sustainability** assesses if there are built-in mechanisms that cushion the pension system against the impacts of demographic change, based on the categories. Data sources are the European Commission, the OECD and the respective national social security administrations and providers.

- Preconditions (60%)
The category preconditions is split into the sub-categories retirement age (80%), in order to assess if adopted increases in the retirement age are high enough to compensate for the expected improvements in further life expectancy, and minimum contribution period (20%).
- Finances (40%)
This category consists of the sub-categories financing (70%) and pension formula (30%).

The pillar **Adequacy** is based on two categories first Pillar and other pension income, which are also split up in further sub-categories. The indicator is based on publicly available information from national social security administrations, ministries of finance and ministries of social affairs, as well as on publications of the European Commission, OECD, ILO, UN and World Bank.

- First pillar (50%)
This category takes into account the coverage (70%) and the benefit level (30%) of the pension system.
- Other pension income (50%)
This category is based on the sub-categories second pillar (20%), financial assets (70%) and gainful employment (10%).

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