MEGATRENDS

EXECUTIVE SUMMARY

THE TRANSFORMATION OF LABOR MARKETS

Winners and losers in a new era

Among its many tragic consequences, the pandemic left labor markets in turmoil. Within a matter of weeks, hundreds of millions of workers around the world saw their income reduced or disappear entirely.

This immediate crisis obscured four long-term, structural changes that were already underway and will ultimately have a far greater impact on reshaping the global workforce and economy.

Powerful demographic trends will create a new and highly differentiated regional map for labor markets

a. The rapid aging and overall decline of workforces in North America and Europe is well understood. What is less appreciated is the dual aging of companies – essentially the combination of older, more settled workers and older companies dampens new business formation, entrepreneurship and innovation, and increases concentration in bigger firms.

b. The transition from a demographic dividend to a demographic drag in East Asia and South America will strain both economic growth and fiscal budgets. The sharpest reversal will be in China – which is projected to face a contraction in its working-age population between now and 2050 of well over 200 million – a decline the size of the entire current US workforce.

c. By contrast, South Asia and sub-Saharan Africa will see a massive rise in the size of their workforces. However, in many of these countries any potential demographic dividend is threatened by institutional fragility, poor business environments, low human capital and climate disasters.

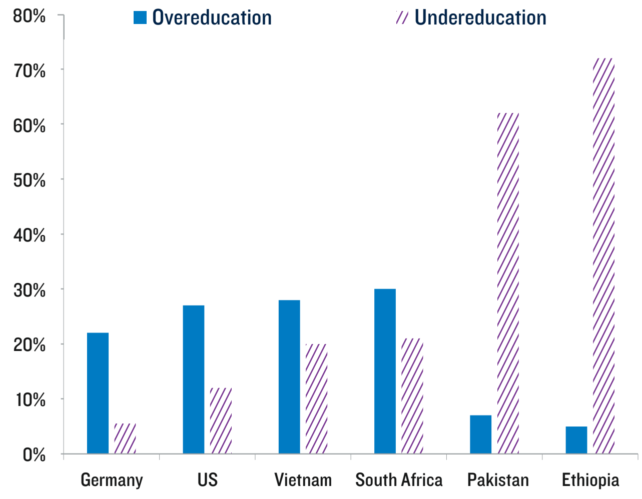
Structural mismatches between labor demand and supply are already evident and may be accelerating

Looking ahead, demographic change, the emergence of new tech paradigms and the resurgence of onshoring are creating an environment where structural labor mismatches will likely increase.

Two kinds of labor mismatches are especially prominent:

a. The ongoing need for plumbers in Australia, renewable energy workers in Europe and elevated rates of youth unemployment in China are all examples of **education mismatches.** Estimates indicate that almost one billion workers worldwide have jobs that don't match their education levels.

Percentage of overeducated vs. undereducated workers across select countries



Source: International Labor Organization. Data as of August 2023.

b. There are over 300,000 unfilled nursing jobs in Germany while 1 out of 10 nurses in Brazil is unemployed. This is a prominent example of a **geographical mismatch** – when both demand and supply for labor are available but in distant locations. Geographic mismatches within a country can be equally concerning. Almost one-third of US workers relocated for a job in the 1980s; that number has fallen to about 5% today.

The complex relationship between technology and labor is entering a new phase

For investors, it is critical to look past hero-villain narratives and focus on three key aspects of the interplay between artificial intelligence and jobs:

a. The rise of "weightless" firms has led to a polarization of jobs and wages. That is, high-paying jobs in sophisticated fields like technology, finance and science are being created along with low-skilled, low-paying jobs in food processing, logistics and personal care.

b. While media headlines about the alarming job displacement power of new technologies abound, the historical evidence suggests these fears may be overblown. New technology, in fact, tends to replace tasks and alter work more than replace workers.

c. The next wave of technology - namely, artificial intelligence - takes automation well beyond the realm of manufacturing and is now disrupting service industries like law, finance, health care and education.

Three aspects of downshifting globalization are underappreciated by investors:

Global labor markets are at a critical turning point. The "golden era" of globalization came replete with outsourced manufacturing, soaring international trade and complex multinational supply chains. After several decades of prominence in the 1990s and 2000s, this era is sunsetting. There are several aspects of this that are especially important for investors:

a. Despite the populist rhetoric, the cross-country movement of workers has not been impacted as much as supply chains and global trade.

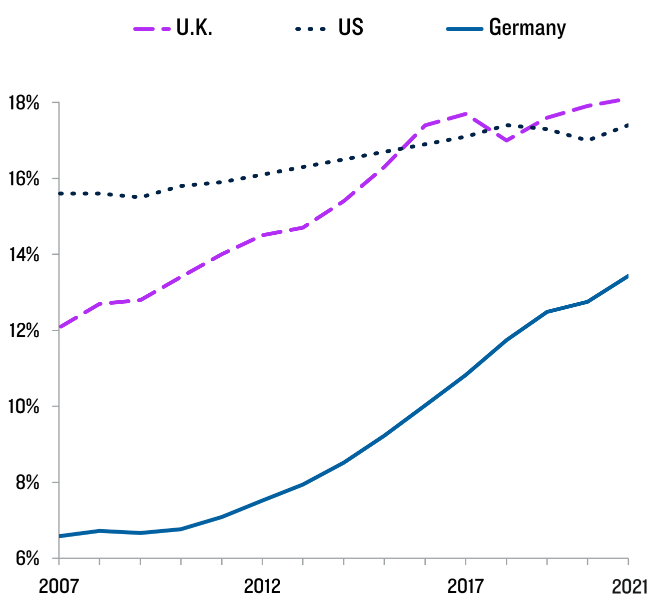
b. Post-COVID supply chains will lead to new patterns of labor demand, potentially exacerbating labor market mismatches. The pandemic has led to a barbelling of global supply chains into (i) more resilient, diversified, multi-regional supply chains and (ii) some "reshored" supply chains returning to their home markets, either because of changing economic logic or government intervention.

c. After an era of increasing returns to capital, a potential resurgence of labor bargaining power may be on the horizon in some countries, most notably the US. Against the backdrop of reduced working-age populations in many economies, initial indications of this can be seen in the increasing number of strikes and labor negotiations happening in both the manufacturing and services sector across the US and Europe.

For investors, the forces reshaping global labor markets will impact wages, productivity, growth, unemployment, inflation and fiscal deficits – creating a new roster of winning and losing industries and countries.

International talent has become crucial

Share of foreign-born workforce



Source: U.K. Office of National Statistics , US Bureau of Labor Statistics and Germany's Federal Statistical Office. Data as of August 2023.
Note: Aggregate of the five countries (US, Russia, Canada, Germany and Australia) with highest average net migration 1960 to 2020.

RESHAPING THE MACRO LANDSCAPE

What kind of impact should investors expect on future inflation, economic growth and fiscal spending patterns?

1. **The new dynamics of labor markets will likely be inflationary**

   In our view, inflationary impulses arising from aging populations will dominate and most economies will experience inflation because of their older demographics. We believe Japan's disinflationary experience will not be representative or easily repeatable as globalization has lost considerable momentum and shrinking national pools of labor are now more widespread.

2. **The new era of labor markets will dampen growth and growth potential**

   If left unaddressed, countries suffering from shrinking working-age populations will see a decline in both their potential and actual growth rates for multiple reasons. First, total factor productivity tends to decline with aging populations. An aging workforce negatively impacts areas that influence growth potential such as investment, innovation and technological progress. Second, the total hours worked will likely decline and – unless productivity rises to compensate – this would also adversely impact overall growth.

3. **Rising dependency ratios will strain fiscal budgets, especially in emerging markets***

   Many emerging markets are set to experience rapid aging and from lower levels of wealth and fiscal strength than many developed countries that went through a similar demographic transition. Those emerging markets that face the sharpest rise in dependency ratios and currently have challenging fiscal situations will face the most acute strain are especially at risk going forward. Our analysis suggests that countries like Brazil, Hungary, China, Tunisia and Malaysia may be most vulnerable.

Countries challenged by high fiscal debt and a rapidly aging population

Source: Adapted from Perasso and Doppelt, "Greying and Greening Across Emerging Markets," PGIM. Data as of August 2023.
Note: EMBIGD refers to J.P. Morgan's Emerging Markets Bond Index Global Diversified.

* The dependency ratio refers to the share of older (65 years and above) and younger (0-15 years) relative to the working age population (16-64 years).

THE TRANSFORMATION OF LABOR MARKETS

WINNERS AND LOSERS IN THE NEW ERA OF LABOR

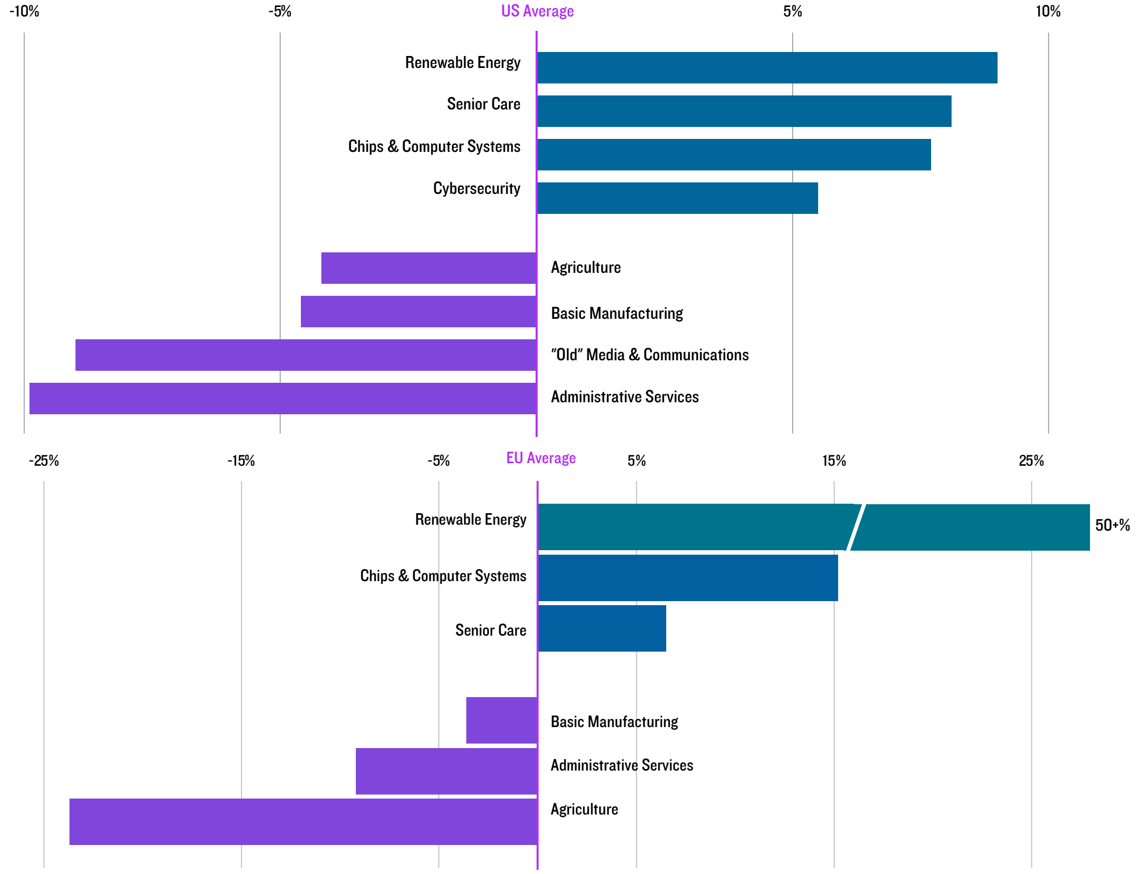
The structural forces reshaping labor markets will determine the next generation of leaders and laggards across industries and countries. It has become cliché to say "demographics are destiny." But for investors, it is critical to recognize that these winners and losers are not pre-determined – and will depend heavily on the quality of responses and actions by governments and firms.

Winning and losing sectors

Two factors are critical in understanding the impact labor market changes will have on different sectors:

1. **Technology is most likely to displace labor in lagging sectors**
   Several sectors stand out as being most vulnerable to new waves of technology disruption. In the US and Europe alone, over 30 million workers across these sectors are expected to be displaced as technological advancement increases productivity and reduces the need for labor.
2. **New technology and demographics will drive employment in leading sectors**
   Four industries will exhibit strong growth and have the highest demand for labor going forward. Employment in these sectors will add 13 million jobs across Europe and the US. However, with strong demand for labor in new locations, it may also amplify existing mismatches between supply and demand for workers with specialized skills.

Employment outlook of future leading and lagging industries in the US and Europe
Employment growth rates above/below national average (2022-2031)



Source: PGIM Thematic Research, Brookings Institution, European Centre for the Development of Vocational Training, European Commission and US Bureau of Labor Statistics. Data as of August 2023.
Note: Numbers are based on occupation forecasts by the BLS, the European Centre for the Development of Vocational Training and direct forecast of renewable job growth from the European Commission; see Appendix for further details.

A framework for investors to assess new labor dynamics by country

To understand how countries are positioned to manage the deep structural changes in labor markets, we have undertaken a multidimensional assessment of each country, focused on:

a. Labor supply: the stock and flow of the working-age population, including the net impact of current migration policies

b. Labor quality: the set of skills and education of a country's workforce and ability to tap global talent

c. Policy environment: the extent to which policies encourage well-functioning labor and capital markets

Select leading and lagging Asian countries

Country		Labor Supply			Labor Quality		Policy Environment	
		WAP	WAP Change	Migration	Human Capital Index	Talent Competitiveness	Productive Capacity	Doing Business
Well Positioned	Singapore	10	3	10	10	10	10	10
	South Korea	9	1	7	10	7	10	10
	New Zealand	6	6	9	9	8	6	10
	Australia	6	7	9	9	9	3	9
	Malaysia	9	7	7	6	7	8	9
Potentially Challenged	Indonesia	8	7	5	4	4	4	5
	Philippines	4	9	4	4	4	7	3
	Pakistan	2	10	1	1	1	3	3

Comparative advantage

10 9 8 7 6 5 4 3 2 1

High Medium Low

Select leading and lagging EMEA countries

Country		Labor Supply			Labor Quality		Policy Environment	
		WAP	WAP Change	Migration	Human Capital Index	Talent Competitiveness	Productive Capacity	Doing Business
Well Positioned	Sweden	3	7	9	10	10	9	9
	Switzerland	7	5	9	9	10	10	7
	United Kingdom	4	5	8	10	10	9	10
	Israel	3	8	7	8	8	9	7
	United Arab Emirates	10	6	4	7	8	6	7
	Saudi Arabia	9	7	8	5	7	7	5
Potentially Challenged	Italy	4	2	7	7	7	8	6
	Greece	4	2	3	7	7	6	4
	Nigeria	2	9	5	2	2	1	2

Comparative advantage

10 9 8 7 6 5 4 3 2 1

High Medium Low

Select leading and lagging countries in the Americas

Country		Labor Supply			Labor Quality		Policy Environment	
		WAP	WAP Change	Migration	Human Capital Index	Talent Competitiveness	Productive Capacity	Doing Business
Well Positioned	Canada	7	7	9	10	9	7	8
	United States	7	6	8	8	10	10	10
	Chile	8	4	9	7	8	3	6
	Costa Rica	8	5	7	6	7	6	4
	Colombia	8	5	8	5	5	5	5
Potentially Challenged	Brazil	9	5	5	4	4	5	2
	Peru	5	8	5	5	4	2	4
	Argentina	4	7	5	5	6	3	1
	Paraguay	4	8	2	4	3	3	1

Source: PGIM Thematic Research, World Bank, INSEAD and Harvard Growth Lab. Data as of August 2023.
Note: WAP refers to current working age population; for all other definitions see Appendix.

Comparative advantage

10 9 8 7 6 5 4 3 2 1

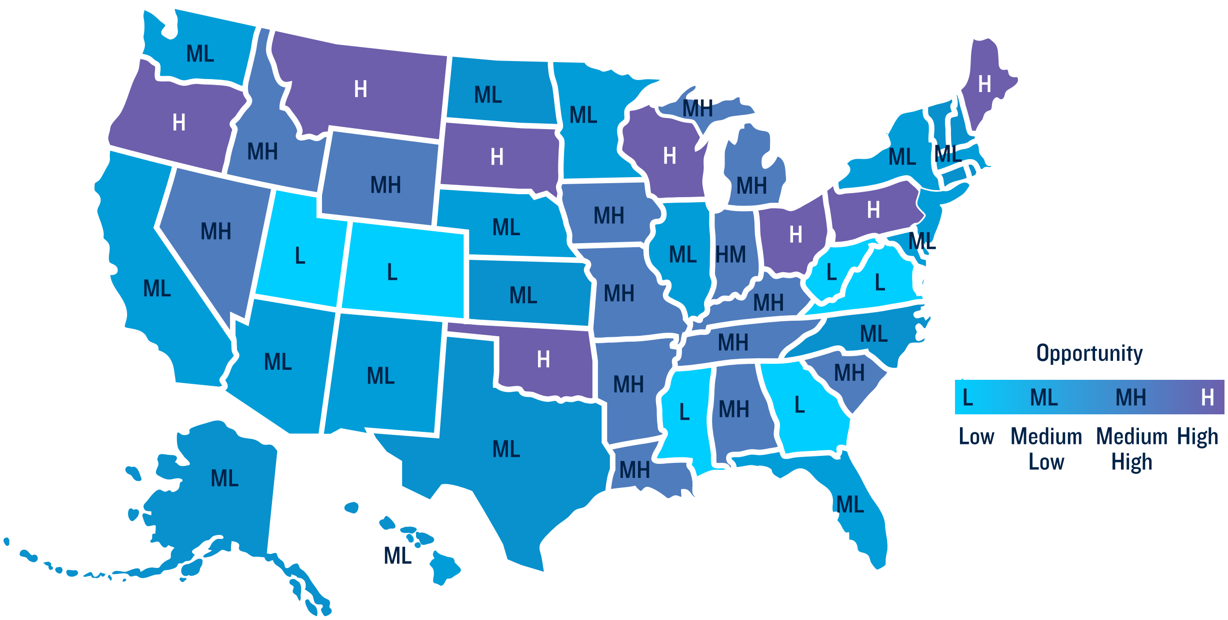
High Medium Low

Getting more granular: A state- and city-level perspective

For investors, in particular in infrastructure and real estate, a national perspective may not be sufficient. They may benefit from a more granular view – especially in the case of large countries with diversified economies where winners and losers may vary by region or city.

To shed further light on the trajectory and evolution of labor mismatches over the coming decade, we collaborated with the Brookings Institution's Workforce of the Future Initiative. Our research examined which states and cities already have workforces in place with skills that best matched the skills of future leading industries – like renewable energy and chip manufacturing – and could draw investment and most easily transition to them over coming years.

The rise of new industries offers varying opportunities across US states



Source: PGIM Thematic Research and Brookings Institution. Data as of August 2023.

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