Focus

The three 'R's: Recovery, reallocation, and resilience

- *Countries' long term growth and productivity are influenced by various factors*
- *One of the most important is the quality of their structural policies*
- *These do much to determine how readily resources move within the economy*
- *This is especially important when the structure of demand and supply are changing fast*
- *This major update of our earlier work reveals important differences between countries*

Introduction

Attention stands to shift progressively to longer term prospects

With more economies getting back towards their pre-pandemic levels of output, attention will shift progressively to prospects longer term. Here, interaction between three dimensions of economic performance stands to be determining:

- **Recovery.** How, and how fast, aggregate demand is recovering is determined by, *inter alia*, the extent of immediate policy support; the degree of success in containing the virus and vaccinating the population; and the ability to meet the changing structure of demand and supply that the pandemic has wrought. And the speed of recovery matters, because it will do much to determine the 'animal spirits' of the private sector and thereby the level of investment, on which living standards depend.

- **Reallocation.** Structures of supply and demand are changing rapidly in virtually all economies, the result not only of the pandemic, but also of climate change, new technologies, and geopolitical pressures to shorten supply chains.

  But economies differ considerably in how proficiently labour and investment moves between and within sectors and industries, and that stands to bear on many aspects of future economic performance. Economies that cannot adjust well will tend to grow slowly, be inflationary, or both.

- **Resilience.** Huge though it has been, the economic shock caused by this pandemic is most unlikely to be the last large shock to economic systems. There will be more; and differences across economies in their resilience to shocks will be all-important in determining not only the depth of future slowdowns, but also the length of recoveries – with all the consequences that flow from that.

The common thread running through these 'three Rs' is the ability, or otherwise, of economies to adjust expeditiously to change. That has always mattered: but it will matter particularly in the coming years, not only because the forces of change are currently particularly rapid, but also because a continuation of the past deteriorating trends, of output and productivity in particular, would be at least unsatisfactory, and at worst could, in some countries, lead to political trouble.

For several decades prior to the Covid-induced hit to growth, productivity growth, for example, had been slowing. In the G20 advanced economies, taken together, the pace of average total factor productivity (TFP) growth had fallen from around 0.7% per year before the 2008 global financial crisis, to a bare 0.3% in the years thereafter, up to the onset of the pandemic.[1]

A premium attaches to improving economic performance

Improving basic performance will become a priority

In many countries therefore a premium attaches to securing a generalised improvement in economic performance; and to that end the ability of economies to effect structural change expeditiously stands to be particularly important. It is of course not the only area. But it is an important one; and is an area where economic policies play a large role – constructively or counterproductively, as the case may be.

How, therefore, do countries compare today in respect of their structural policies? This is not a familiar area to analysts who focus predominantly on demand-side, rather than supply-side, determinants of economic performance. And in previous epochs there have been few economic data on structural policies. But today there are many such data; and overall they are of impressive quality.[2] Moreover, being in large part quantitative, they can be aggregated, to form some sort of overall picture.

A matter of definition

Structural policies – undoubtedly a broad concept – are taken here to be:

> *"Policies that encourage, or at least do not inhibit, the flow of resources from declining and less productive activities to growing and more productive activities."*[3]

The supply side matters

Increasing emphasis will be placed on supply-side aspects …

Delivering good structural policies is both complex and, frequently, politically challenging. A common source of political friction is that the associated costs are typically narrowly focused and immediate, whereas the benefits accrue only slowly, and are spread comparatively thinly.

However, at the aggregate level the potential benefits can be large: an extensive and growing suite of research demonstrates positive linkages between broad structural policy – reforms and settings – and economic performance.

- The IMF, for example, has found a positive relationship between structural policy and economic performance – including with GDP growth and investment growth – and over a range of time horizons.[4]

- The OECD has found evidence that good structural policies and settings improve performance in the event of economic and financial crises:

> *"More flexible product markets are associated with smaller crisis-related losses in potential output, which may be because this allows for an easier reallocation of resources across firms and sectors in the aftermath of an adverse shock."*[5]

… including all-important structural policies

These effects of structural policies are not only statistically significant, but also quantitatively important:

- The IMF has shown that reallocation of labour and capital across firms tends to cushion the hit to productivity during recessions. Firm-level analysis across 19 countries spanning over 20 years finds that sectors with greater resource reallocation not only tend to experience a significantly smaller decline in total factor productivity during recessions, but also recover faster.[6,7]

- The OECD has found that a 1-standard-deviation difference in its product-market regulation (PMR) indicator is typically associated with a difference in crisis output losses of 2½ percentage points.[8]

Which policies?

We have assembled a mass of supply-side data …

While there are many areas in which structural policies can be important, the consensus of the now-large body of empirical research in this area is that three basic areas are of particular importance: [9]

Product market regulation (PMR)

- **Improving insolvency and restructuring procedures** frees up resources in unviable firms, enabling capital to be put quickly to more efficient use.

- **Reducing state control** (e.g., public ownership and government involvement in business operations), boosts competition and facilitates the exit and entry of firms.

- **Lowering barriers to trade** facilitates knowledge spill-overs and helps to curb market power.[10]

Labour market flexibility

- **Well-designed employment protection laws** support workers during times of crisis, but thereafter do not stand in the way of reallocation to more efficient uses as and when needed.

- **Optimal labour taxation** avoids unduly inhibiting hiring and firing.[11]

- **Active labour market policies** support displaced workers in crisis while equipping them, through training and other assistance, to move to new jobs as the recovery strengthens.

Human capital

- **Quantity and quality of education**. A strong educational foundation is a basic enabler of a flexible skill set, as well as lifelong learning, and supports productivity long-term. Furthermore,

more educated/higher-skilled workers typically are less likely to be displaced in crisis than are less highly educated workers.[12]

▪ **Training and reskilling workers**, including through on-the-job training, supports inclusiveness, boosts human capital and strengthens potential growth.

Structural policies heatmap 'take 2': our basic approach

… analysed them …

We have long emphasised the importance of structural policies as an important determinant of economic performance, [13] and have sought to find ways to present the evidence on their comparative quality across countries.

This involves both reducing a mass of quantitative data to a limited number of appropriately-constructed summary statistics, and presenting them in a visually readily-assimilable form.

We first did this in 2017 and presented the results in a heatmap. [14] And from time to time we have undertaken partial, qualitative, updates. But now, four years on, we have undertaken a 'root and branch' updating.

… aggregated them …

Our new heatmaps are not directly comparable with the earlier ones: variables and specifications have been changed somewhat. That said, both studies seek to address the same basic question: 'How do countries stand vis-à-vis one another in key structural policy areas'.

This time, profiting not least from the considerable body of research that has been published since our previous major study, we have intentionally 'kept it simple', focusing this time on just the three broad categories that have been shown to be particularly important for productivity, growth, and resilience to shocks – **product market regulation, labour market flexibility, and human capital**.[15]

Other considerations include:

▪ In addition to the three areas above in which we focus in this present study there are, of course, others too, including: quality of institutions; investment in physical and intangible capital; R&D expenditure; financial market efficiency; etc. But we are saving these for a later occasion.

▪ We have in turn kept the range of indicators down to just **three per category** (see Figure 1), although in some cases these indexes are themselves composed of several sub-indexes. [16]

▪ We have then ranked each series from **'best' to 'worst' in class** (with 'dark green' indicating the former and 'dark red' the latter); and then an average equal-weighted average rank has been computed.[17]

… and present them as 'heat maps'

▪ We emphasise that while the quality of the data on which we draw is impressively high, and has been compiled with considerable care by its constructors, [18] we do not view our aggregation/ranking exercises as by any means 'precision science'.

▪ Rather, what we are seeking to do is simply to boil that mass of information down to a few, easy to understand, but nevertheless broadly valid, summary indicators, so as to provide a reasonable guide as to which countries seem well placed, and which less well placed, to handle what are likely to prove to be major structural adjustment challenges that derive from the recovery from COVID-19; technological change; climate change; and so on.

Figure 1: Summary of structural policies heatmap variables

Category/Indicator	Measurement	Time period	Source
Product market regulation			
Resolving insolvency	Index, 0-100	2020	World Bank
Distortions induced by state involvement	Index, 0-6	2018	OECD
Barriers to domestic and foreign entry	Index, 0-6	2018	OECD
Labour market flexibility			
Strictness of employment protection (regular and temporary contracts)	Index, 0-6	2019	OECD
Average tax wedge	% of labour costs	2019	OECD
Public expenditure on active labour market policies	% of GDP	2018	OECD
Human capital			
Percentage of adults with at least upper secondary and/or tertiary education	%	2019	OECD
PISA test scores (reading, maths, and science)	Average score	2018	OECD
Percentage of employed adults participating in non-formal education and training	%	2016/17	OECD

Source: Llewellyn Consulting compiled from the OECD and World Bank

> ▪ For investment analysts to add an additional 'country overlay' to the analyses that they typically undertake using other variables – such as expected growth, profitability, etc.

Some key results

The 'heatmaps' for the three categories and the aggregate are presented in Figures 1 and 2 in the Appendix.

Some broad observations and conclusions:

1. While some of the 'top' countries have swapped places since the previous heatmap (and are also somewhat sensitive to the precise methods of aggregation and the choice of structural policy indicators used), the 'bottom' group, which includes Mexico, Turkey, and Greece, is unchanged. This is perhaps not surprising, not least given the markedly lower income levels in these countries.

2. Overall, however, notwithstanding some significant changes in rankings, the correlation between our earlier rankings and these new ones is quite high: $R^2 = 0.75$.

3. Among the 'top' group, the Nordic countries continue to score well – Denmark tops the rankings, closely followed by Finland and Sweden.

4. The UK's position as the second best is perhaps somewhat surprising. It is driven primarily by that country's strong showing in the product market regulation category; it fares notably less well in respect of 'human capital', for example. It is also likely that when including a wider set of structural policy indicators (e.g., investment in infrastructure) as we have done in our prior work, the UK would do less well.

5. Japan is the one G7 economy that tends to rank reliably in the top 10, and its performance is fairly consistent across the three categories, with a particularly strong standing in 'human capital'.

6. The position of the US continues to be an unremarkable 'just above average', and it lags behind Germany, Japan, and Canada. It is let down by its product market policies, and its particularly weak active labour market policies. However, it ranks rather well on 'human capital'.

7. Slovenia and Estonia, both tiny economies, 'punch well above their weight', primarily due to their strong readings in the 'human capital' category.

8. Luxembourg's ranking in the 'bottom' groups seems surprising, and owes to its poor showing in the product market category. Luxembourg has come up as an 'outlier' already in our previous work, i.e., it has higher GDP per capita than would be suggested by its structural scores.[19] One possible explanation is that Luxembourg's financial sector is highly productive and profitable, whereas its wider economy is not.

9. France has moved from average towards the lower end of the ranking; and Italy continues to be the least well-placed major economy.

Issues

Proxying the complex and wide-ranging structural policy measures by a handful of indicators is bound to be imperfect; and research of this sort invariably throws up many issues. In our judgement, having worked with these data for many years, these issues are not so important as to invalidate the basic conclusions. On the contrary, our experience is that the data are generally good; they tell empirically verifiable stories; and constitute part of a useful toolkit for assessing likely future economic performance across countries.

That said, it is appropriate to note some of the caveats and other issues that we have come across in the course of this work.

▪ **Abundance of indicators**. In contrast to some decades ago, when there were scarcely any indicators with which to assess structural policies, now the situation is the reverse – almost an 'embarrassment of riches'. The challenge today is to decide which series to choose.

For example, the OECD Structural Policy Indicators Database for Economic Research (SPIDER), which is just one of several, has over 800 entries. Structural indicator databases are also provided by the World Economic Forum, the World Bank, the International Labour Organisation, The Fraser Institute, and many more.

▪ **Data gaps.** The plethora of data notwithstanding, some series (expenditure on active labour market policies (ALMP) in particular), while conceptually highly important, have crucial data gaps (e.g., data for the UK have not been provided by that country since 2011). In such cases we have resorted to a combination of simple regression analysis and educated guesses in order not to have to give up on the entire series. Likewise, for some countries, data were not particularly current, so we have had no option but simply to use the most recent data points available.

We intend, in a further round of work in due course, to examine public expenditure on ALMPs per person unemployed, rather than, its share of GDP.[20]

Further, the structural policies data are either not available, or are of poor quality, for most non-OECD countries, so it has not been possible to include some major economies including, regrettably, China, as well as a number of other economically important non-OECD countries.

▪ **Aggregation brings its own issues**. Simple averaging masks some extremes; but here we have taken the view that ultimately the concern is with a broad placement of countries vis-à-vis one another.

▪ **Structural policies take time to pay off**. Today's economic outcomes are, in some cases (e.g., education), probably more reflective of structural policies implemented a decade or so ago. Others, however (e.g., 'hiring and firing' rules and insolvency procedures) will take effect with much shorter lags.

▪ There is inevitably also **an element of informality** that is not captured in the official 'hard' data. The employment protection data for the US, for example, suggests that it has the most lax regulation of the entire sample: but in practice (as we are often told), this is often not the case, not least at the level of individual firms, and especially large ones.

▪ New, and often better, data become available all the time. In future work, we would like to measure cross-country readiness for technological and climate change, and relate that to these areas more specifically (e.g., measures of digitisation, technological adoption, R&D expenditure, quality of institutions; relative fossil fuel dependency; share of renewable energy in total, etc.)[21]

Watch fors [22]

It is evident that structural policies are important determinants of economic performance; that in the current time of rapid change they are likely to be of even greater importance than hitherto; and that their quality differs considerably across countries.

Hence watch for:

▪ A general tendency for the economies towards the 'green end' of our heatmap spectrum to handle the post-COVID-19 period better than those at the other end; and

▪ Changes in individual countries' structural polices that stand to change economic performance significantly.

  – Changes such as the Germany's Hartz labour market reforms of 2003 to 2005; or those of the UK's Thatcher Government in the 1980s, or those in Australia and New Zealand, not least in the 1980s and 1990s, are not frequent; but they can have substantial effects.∎

Appendix

Figure 1: Structural policies individual category heatmaps

Product market regulation	Unit	Denmark	Germany	United Kingdom	Norway	Netherlands	Spain	Sweden	Australia	Slovenia	Finland	Czech Republic	Japan	Portugal	Italy	Ireland	New Zealand	Estonia	Austria	Israel	Lithuania	Belgium	Latvia	Hungary	United States	Poland	Korea	Chile	Slovak Republic	Canada	Switzerland	France	Mexico	Greece	Luxembourg	Turkey
Resolving insolvency	Index, 0-100	85	90	80	85	84	79	80	79	84	93	80	90	80	77	79	69	60	77	73	47	84	60	55	90	77	83	60	65	81	63	75	70	53	45	38
Distortions induced by state involvement	Index, 0-6	1.4	1.4	0.8	1.4	1.1	1.2	1.5	1.4	1.6	1.7	1.3	2.0	1.6	1.6	1.5	1.7	1.5	1.7	1.5	1.8	1.7	1.8	1.6	1.9	1.7	1.7	1.5	1.5	1.8	2.0	1.8	1.7	2.0	2.0	2.2
Barriers to domestic and foreign entry	Index, 0-6	0.6	0.8	0.7	0.9	1.1	0.8	0.8	0.9	1.0	1.0	1.3	0.9	1.1	1.1	1.2	0.8	1.1	1.2	1.3	0.6	1.7	0.7	1.1	1.5	1.2	1.7	1.3	1.5	1.7	1.1	1.3	1.5	1.1	1.4	2.4
Average rank - Product market regulation		5.3	5.3	5.3	6.7	8.7	9.0	10.3	11.3	12.0	12.3	14.0	15.0	15.0	16.7	17.0	18.3	19.0	20.0	20.0	20.3	20.7	20.7	21.0	21.0	21.3	22.0	22.3	23.0	23.3	25.7	26.0	26.0	28.3	32.0	35.0

Labour market flexibility	Unit	Switzerland	Denmark	Ireland	United Kingdom	New Zealand	Australia	Canada	United States	Finland	Sweden	Korea	Israel	Japan	Poland	Lithuania	Spain	Hungary	Austria	Netherlands	Estonia	Norway	Belgium	Latvia	Mexico	Luxembourg	Germany	Chile	France	Slovenia	Portugal	Czech Republic	Greece	Slovak Republic	Italy	Turkey
Strictness of employment protection	Index, 0-6	1.3	1.6	0.9	0.9	1.3	1.3	0.4	0.2	1.8	1.6	2.3	1.6	1.2	2.0	1.4	2.3	1.4	1.8	2.4	2.4	2.5	2.1	0.9	2.1	2.9	2.0	2.8	2.8	1.8	2.5	2.3	2.4	2.4	2.8	3.6
Average tax wedge	% of labour costs	22	35	33	31	19	28	31	30	42	43	23	23	33	36	38	39	45	48	37	37	36	52	42	20	38	49	7	47	43	41	44	41	42	48	40
Public expenditure on ALMP*	% of GDP	0.6	1.9	0.4	0.3	0.2	0.2	0.2	0.1	0.9	1.1	0.4	0.2	0.2	0.4	0.3	0.7	0.6	0.8	0.6	0.5	0.4	0.9	0.2	0.0	0.7	0.7	0.1	0.8	0.2	0.3	0.3	0.2	0.2	0.4	0.1
Average rank - Labour market flexibility		8.0	8.7	11.0	11.7	12.0	12.7	13.0	14.0	14.3	14.3	15.0	16.0	16.0	16.0	16.3	16.7	17.0	18.0	18.3	19.3	19.3	19.7	19.7	20.0	20.7	21.7	22.3	22.7	24.0	24.3	24.3	24.3	24.3	26.7	29.7

* ALMP stands for active labour market policies

Human capital	Unit	Canada	Korea	Finland	Switzerland	Japan	United States	New Zealand	Slovenia	Netherlands	Estonia	Sweden	Australia	Ireland	Poland	Austria	Czech Republic	Germany	Norway	Hungary	Slovak Republic	United Kingdom	France	Latvia	Israel	Denmark	Lithuania	Belgium	Portugal	Luxembourg	Chile	Italy	Spain	Greece	Turkey	Mexico
% of adults with at least upper secondary and/or tertiary education	%	92	89	90	89	100	91	81	89	80	90	84	83	80	93	86	94	87	83	85	91	68	80	88	87	82	93	79	52	75	67	62	61	74	42	40
PISA test scores (reading, maths, and	Average score	517	520	516	498	520	495	503	504	502	525	502	499	505	513	491	495	500	497	479	469	504	494	487	465	501	480	500	492	477	438	477	482	453	463	416
% of employed adults participating in non-formal education and training	%	64	59	56	72	49	68	74	55	72	48	63	65	59	31	67	53	56	65	66	57	55	58	54	57	51	33	51	54	53	55	52	47	19	28	42
Average rank - Human capital		6.0	8.7	9.7	9.7	10.3	10.3	11.0	12.3	12.7	13.0	13.0	14.0	14.0	14.3	14.7	14.7	15.0	15.0	16.7	16.7	18.3	19.0	19.3	19.7	20.0	20.3	22.3	25.3	26.3	27.3	28.0	29.0	32.0	33.3	33.7

Source: Llewellyn Consulting, compiled from the OECD and World Bank

Note: The heatmaps have been sorted by the average rank for each category.
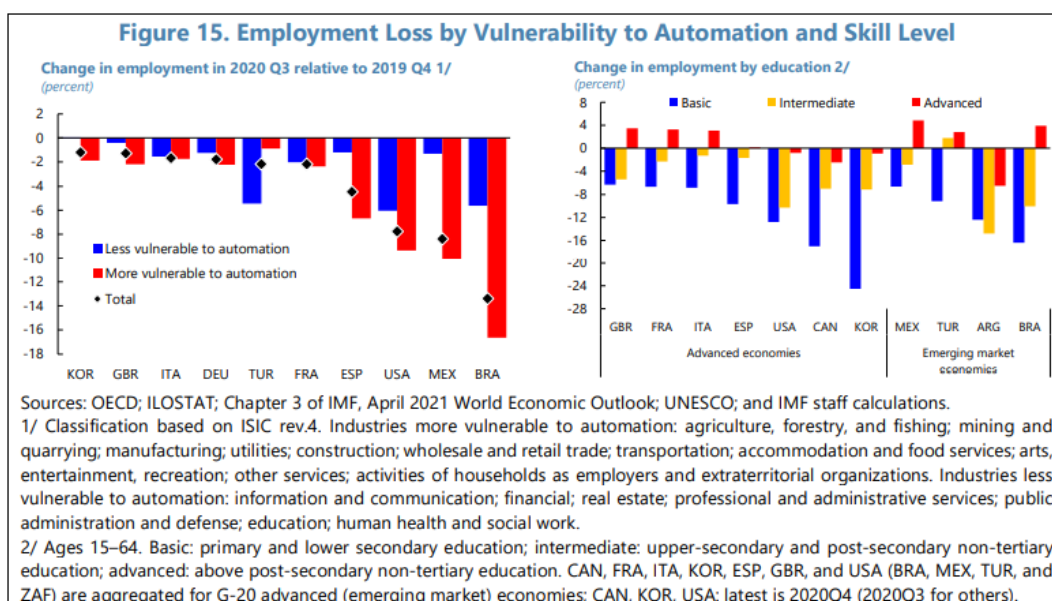
Figure 2: Structural policies overall heatmap

	Unit	Denmark	United Kingdom	Finland	Sweden	Australia	Netherlands	Norway	Germany	New Zealand	Japan	Ireland	Canada	Switzerland	United States	Korea	Slovenia	Estonia	Poland	Austria	Czech Republic	Hungary	Spain	Israel	Lithuania	Latvia	Belgium	Slovak Republic	Portugal	France	Chile	Italy	Luxembourg	Mexico	Greece	Turkey
Product market regulation	**Unit**																																			
Resolving insolvency	Index, 0-100	85	80	93	80	79	84	85	90	69	90	79	81	63	90	83	84	60	77	77	80	55	79	73	47	60	84	65	80	75	60	77	45	70	53	38
Distortions induced by state involvement	Index, 0-6	1.4	0.8	1.7	1.5	1.4	1.1	1.4	1.4	1.7	2.0	1.5	1.8	2.0	1.9	1.7	1.6	1.5	1.7	1.7	1.3	1.6	1.2	1.5	1.8	1.8	1.7	1.5	1.6	1.8	1.5	1.6	2.0	1.7	2.0	2.2
Barriers to domestic and foreign entry	Index, 0-6	0.6	0.7	1.0	0.8	0.9	1.1	0.9	0.8	0.8	0.9	1.2	1.7	1.1	1.5	1.7	1.0	1.1	1.2	1.2	1.3	1.1	0.8	1.3	0.6	0.7	1.7	1.5	1.1	1.3	1.3	1.1	1.4	1.5	1.1	2.4
Labour market flexibility																																				
Strictness of employment protection	Index, 0-6	1.6	0.9	1.8	1.6	1.3	2.4	2.5	2.0	1.3	1.2	0.9	0.4	1.3	0.2	2.3	1.8	2.4	2.0	1.8	2.3	1.4	2.3	1.6	1.4	0.9	2.1	2.4	2.5	2.8	2.8	2.8	2.9	2.1	2.4	3.6
Average tax wedge	% of labour costs	35	31	42	43	28	37	36	49	19	33	33	31	22	30	23	43	37	36	48	44	45	39	23	38	42	52	42	41	47	7	48	38	20	41	40
Public expenditure on ALMP	% of GDP	1.9	0.3	0.9	1.1	0.2	0.6	0.4	0.7	0.2	0.2	0.4	0.2	0.6	0.1	0.4	0.2	0.5	0.4	0.8	0.3	0.6	0.7	0.2	0.3	0.2	0.9	0.2	0.3	0.8	0.1	0.4	0.7	0.0	0.2	0.1
Human capital																																				
% of adults with at least upper secondary and/or tertiary education	%	82	68	90	84	83	80	83	87	81	100	80	92	89	91	89	89	90	93	86	94	85	61	87	93	88	79	91	52	80	67	62	75	40	74	42
PISA test scores (reading, maths, and science)	Average score	501	504	516	502	499	502	497	500	503	520	505	517	498	495	520	504	525	513	491	495	479	482	465	480	487	500	469	492	494	438	477	477	416	453	463
% of employed adults participating in non-formal education and training	%	51	55	56	63	65	72	65	56	74	49	59	64	72	68	59	55	48	31	67	53	66	47	57	33	54	51	57	54	58	55	52	53	42	19	28
AVERAGE RANK - ALL		11.3	11.8	12.1	12.6	12.7	13.2	13.7	13.7	13.8	13.8	14.0	14.1	14.4	15.1	15.2	15.7	17.1	17.2	17.6	17.7	18.2	18.2	18.6	19.0	19.9	20.9	21.3	21.4	22.4	23.8	23.8	26.1	26.4	28.2	32.7

Source: Llewellyn Consulting, compiled from the OECD and World Bank

Note: The heatmap has been sorted by the overall average rank.

[1] IMF, 2021. *Boosting productivity growth in the aftermath of Covid*-19. Available at: https://www.imf.org/external/np/g20/pdf/2021/061021.pdf [Accessed 1 July 2021]

[2] This 1999 OECD Working Paper explains how the indicators were first created, and the vast amount of information that went into them — and still does. https://www.oecd-ilibrary.org/economics/summary-indicators-of-product-market-regulation-with-an-extension-to-employment-protection-legislation_215182844604

[3] This definition owes to Gerald Holtham and John Llewellyn, and dates from their early work in this area at the OECD in the 1980s.

[4] See for example, IMF, 2015. *Structural Reforms and Macroeconomic Performance*. International Monetary Fund, Washington, D.C. especially pp. 19-20 Available at: http://www.imf.org/external/np/pp/eng/2015/101315.pdf [Accessed 1 July 2021]

[5] See Patrice Ollivaud and David Turner, 2015. *The effect of the global financial crisis on OECD potential output*. Available at: the-effect-of-the-global-financial-crisis-on-oecd-potential-output-oecd-journal-economic-studies-2014.pdf [Accessed 1 June 2021] p. 54

[6] Four years after a recession, total factor productivity (TFP) typically recovers above its pre-recession level in sectors with above-average reallocation during the recession, while it remains below its pre-pandemic level in sectors with below-average reallocation (Figure 10). While causality is hard to pin down, this inverse relationship between reallocation and TFP losses is suggestive of a reallocation during recessions that favors a shift of labor and capital to firms where their marginal product is relatively higher. For more, see the IMF, 2021.

[7] "In our latest World Economic Outlook we examine how policies can lessen the pandemic's harsh and unequal effects. We find that a package of measures to help workers keep their jobs while the pandemic shock is ongoing, combined with measures to encourage job creation and ease the adjustment to new jobs and occupations as the pandemic ebbs, can markedly dampen the negative impact and improve the labor market's recovery." For more, see the IMF blog, March 2021. *Working Out the Differences: Labor Policies for a Fairer Recovery*. Available at: the-effect-of-the-global-financial-crisis-on-oecd-potential-output-oecd-journal-economic-studies-2014.pdf [Accessed 15 June 2021]

[8] See Patrice Ollivaud and David Turner, 2015. *The effect of the global financial crisis on OECD potential output*. Available at: the-effect-of-the-global-financial-crisis-on-oecd-potential-output-oecd-journal-economic-studies-2014.pdf [Accessed 1 June 2021]

Another OECD study also makes the case that structural policies can support economies' ability to bounce back strongly and rapidly. For more, see Duval, Elmeskov and Vogel, 2007. Structural Policies and Economic Resilience to Shocks. Available at: BUSINESS CYCLES: THE ROLE OF MODERATION, CONVERGENCE AND RESILIENCE (oecd.org) [Accessed 29 July 2021]

[9] The discussion has drawn extensively upon the IMF June 2021 work as cited above.

[10] Anti-trust policies are being actively debated right now in Europe and the United States, particularly in the context of highly profitable technology companies in the aftermath of the Covid pandemic.

[11] The average tax wedge, for example, measures the extent to which tax on labour income discourages employment.

[12] Historically, employment losses in middle-skill routine occupations accelerated during downturns. The current pandemic has also hit sectors that are more vulnerable to automation much harder and lowered the share of low-skilled and low-wage workers in the workforce.


Figure 15. Employment Loss by Vulnerability to Automation and Skill Level

Sources: OECD; ILOSTAT; Chapter 3 of IMF, April 2021 World Economic Outlook; UNESCO; and IMF staff calculations.
1/ Classification based on ISIC rev.4. Industries more vulnerable to automation: agriculture, forestry, and fishing; mining and quarrying; manufacturing; utilities; construction; wholesale and retail trade; transportation; accommodation and food services; arts, entertainment, recreation; other services; activities of households as employers and extraterritorial organizations. Industries less vulnerable to automation: information and communication; financial; real estate; professional and administrative services; public administration and defense; education; human health and social work.
2/ Ages 15–64. Basic: primary and lower secondary education; intermediate: upper-secondary and post-secondary non-tertiary education; advanced: above post-secondary non-tertiary education. CAN, FRA, ITA, KOR, ESP, GBR, and USA (BRA, MEX, TUR, and ZAF) are aggregated for G-20 advanced (emerging market) economies; CAN, KOR, USA: latest is 2020Q4 (2020Q3 for others).

For more, see the IMF June 2021 work as cited above.

[13] One of us first worked on the analysis of structural policies, then a virtually new subject of investigation, as far back as the 1980s.

[14] For more, see Sepping, S., and Dharmasena, B., 2017. *Structural policies heatmap revisited*. 21 June, Llewellyn Consulting.

[15] In boiling down the mass of information, we were guided by the huge, detailed, thorough econometric multi-country, multi-episode studies that the IMF in particular has undertaken in its quest to find which policies seem best to account, in a statistical sense, for part of the cross-country variance in those macroeconomic variables that financial analysts typically look at – GDP growth,

productivity growth, and GDP loss in the face of shocks (so-called 'resilience'). These studies are reported in our *World View & Risks*, endnote 9, last two bullets.

[16] The decision to limit the variables essentially to three in each category was essentially arbitrary, borne of a wish to keep the analysis simple and clear. In future updates we may add a few more, if or when there is a clear case for so doing. Note however that some of the indicators are aggregates of a number of underlying series, e.g. the OECD's product market regulation index includes 18 lower-level indicators, as shown below:
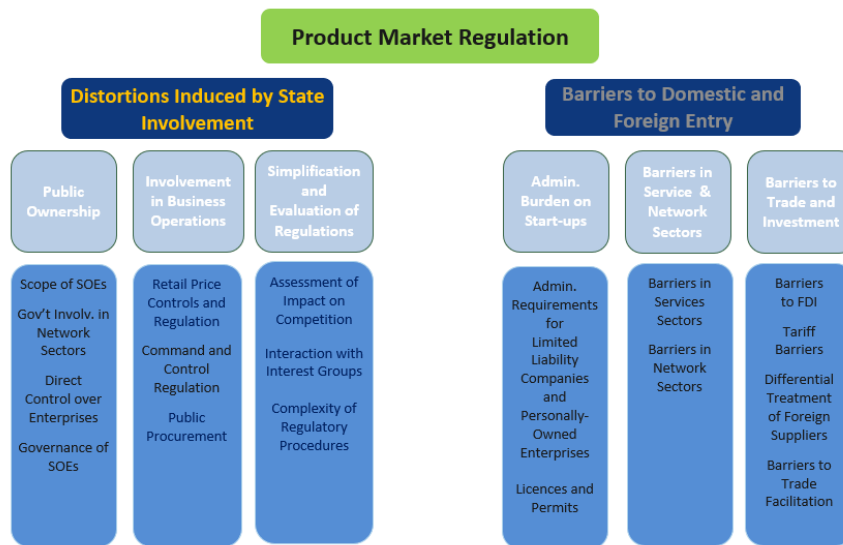
For more, see [Indicators of Product Market Regulation - OECD](#)

[17] Our previous structural policies heatmap had a somewhat different method of aggregation, i.e., grouping/colouring countries into five categories based on a specified z-score criteria. The aim of both approaches, however, has been ultimately to rank the countries vis-à-vis one another, so we have now adopted a simpler method. That said, the method of aggregation does not change the overall rankings meaningfully. For the present work, both methods of aggregation were trialled and the correlation between the overall scores was around 0.95.

[18] At a micro level, and in immense detail, by large numbers of analysts in the OECD and the IMF, in response to questionnaires answered by hundreds of subject specialists in 34 national administrations who know their specific areas intimately. And in turn these responses were checked and cross-checked by joint committees of experts from national administrations, whom we know from experience are strong on policing each other's claims!

[19] For more, see Llewellyn Consulting, July 2021. *World View & Risks*. Available upon request.

[20] The use of this measure has been advocated by John Martin, amongst others.

[21] While we chose not to use the PIAAC scores from 2011-2012, for example, as a component of the Human Capital category (notably as the proxy for ICT-literacy) because they are rather out-of-date, scores from the second PIAAC wave should become available in 2023, and it would be highly desirable to include these data in a further update.

[22] It should be incumbent on any analyst or forecaster to indicate what circumstances, were they to eventuate, would call into question the forecast or expectation, or, more fundamentally, the understanding on which these were made. Moreover, in deciding which data should be asked to bear the greatest weight, it is important to minimise the risk of Kahneman 'confirmation bias' – selecting the data that best support the case being made. In our 'Watch Fors' we make clear what data, were they to eventuate, would in our judgement invalidate our forecast or expectation.