



# The future of labour segmentation after Covid-19

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## **Chapter 24: The future of labour segmentation after the COVID-19**

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**Abstract:** Labour segmentation in national markets roughly operates through two porous borders, separating jobs into sectors - formal vs. informal ones - and into status - self-employed vs. paid employed, but characterized by a lot of overlapping. It results from the process of job creation, determined partly by labor-saving innovations in production and globalization. The chapter is an essay to describe how the pandemic interacts with these two factors to potentially reshape the allocation of jobs between informal self-employment and formal paid employment or other possible combinations. The main findings is that the impact of these interactions is highly unclear on the medium or long-term trend of labor. As self-employment has been an answer in most countries to the job shortage in the prevalent informal form, the pandemic by reducing total employment in the short run first destroys low-paid employment but without challenging the current trajectory of employment along segmentation - low job creation driven by higher digitalization.

**Keywords:** informal employment, self-employment, digitalization, work from home, skill mismatch.

### 24.1 Introduction

Job creation has been highly challenging since ICT innovations have led to the new era of digitalization, threatening many economic tasks considered as routine ones, allowing an easy replacement of human beings by machines. Moreover, this digitalized world relies on highly global supply chains, determining the allocation of labour across the world. The pandemic could reshuffle the cards by first modifying significantly the logic of the global value chains, and then the labour cost and its allocation. However, it could also dampen the digitalization process observed before. The result of the pandemic is then highly unclear on the medium or long-term trend of labour, and especially its division between formal and informal employment in one hand and salaried employment and self-employment in the other one. Indeed job opportunities are an issue in most developing countries, partially depending on outsourcing from developed ones. Then the prevalence of self-employment is an answer to the

job shortage, self-employment being likely informal and preventing economies of scale achievement, and then job creations. Does then the pandemic reduce total employment, without changing the share of informal employment, but increasing self-employment by reducing available tasks already threatened by of digitalization? On the contrary, as the advent of the COVID-19 has been associated to environment issues, green policies could generate new job opportunities but the nature of these jobs, informal or not, self-employed or not, is not so easy to forecast.

This chapter is an attempt to answer these questions by first assessing the direction taken by the labour market aggregates. This amounts to compare the trends in developing countries, illustrated here by India, to the worldwide ones before the pandemic. Then in a second moment, predictions of these trends after the pandemic will be formulated relying on the papers initiated by Acemoglu & Autor (2011). Indeed the development of automation linked to innovation associated to Artificial Intelligence is at the heart of the job creation process in this century, provoking mixed vision on the future of work, in either developed or developing countries. Using machines and computers to substitute for human labour is an old story beginning at the end of the 19<sup>th</sup> century, resulting in the past by some increase in demand for labour and wages. If this consequence seems expected for the 4<sup>th</sup> industrial revolution, the economic adjustment to its full realization appears slow and costly for the labour market to adapt, at least in the short and medium run. Indeed technological progress encourages capital-intensive activities that translate in job destruction, magnified for the unskilled, in the developed countries. For developing countries, it implies labour shortage and skill mismatch as their exporting companies adopt these innovations. Indeed two opposite movements in developing countries' labour demand characterize globalization: outsourcing that exploits the lower labour cost in developing countries and jobless economic growth. The occurrence of the pandemic changes the balance between these forces as it caused a violent and sudden slowdown in international trade that strongly affected global value chains and then countries with high dependence to a limited range of export and import goods. The persistence of the pandemic itself but also of its consequences threatens normalization, by creating a new trend in labour markets, as working from home, which is biased toward some type of employment, rather formal and skilled, magnifying the main effect of the actual technologies. The discussion below will develop this issue by taking into account the main feature of developing countries labour markets that is segmentation, along the lines of self-employment and informality. The following section is dedicated to a brief comparison between Indian and

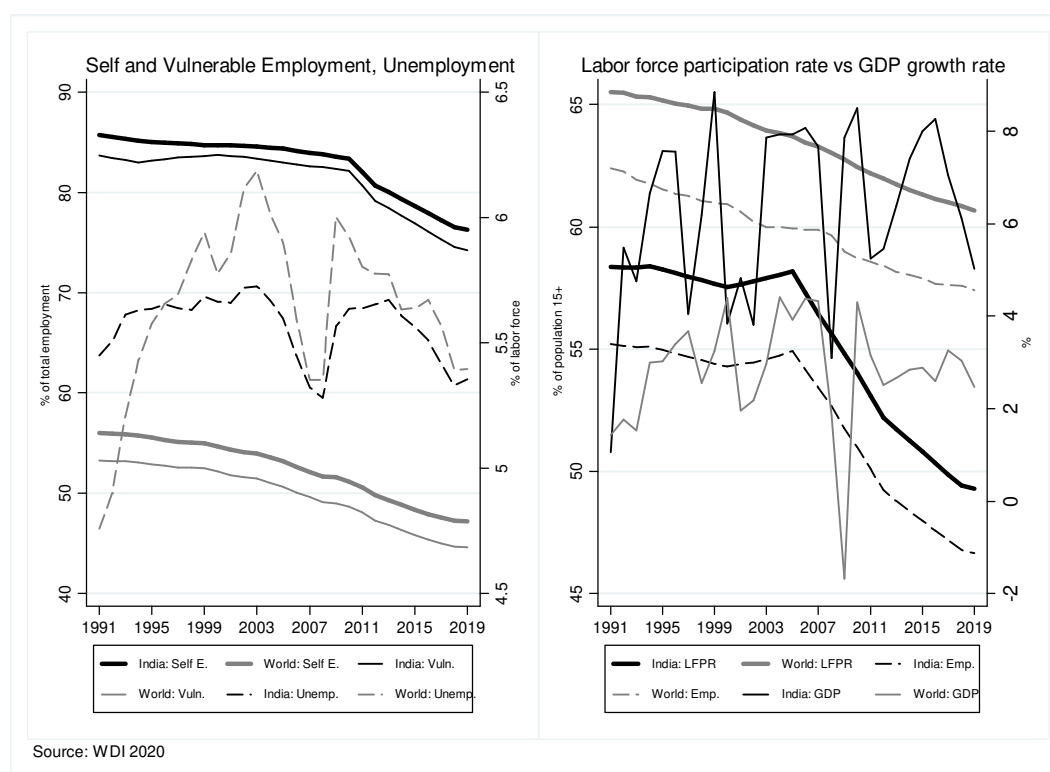
worldwide labour markets providing evidence on the labour market segmentation, the third one attempting to lay the stones of the analysis of the future of labour segmentation.

## 24.2 A brief overview of labour outcomes: India vs. the world<sup>1</sup>

According to the standard view, labour segmentation is defined by the quality of the job, described by different inputs, as working conditions<sup>2</sup>. In developing countries, the initial focus was on access to social protection - like unemployment and health insurance, minimum wage or retirement rights and pensions, defining formal workers. This section documents then the dominance of informal employment in India, given that a majority of workers are self-employed and that the service sector becomes the new job opportunity pool.

### 24.2.1 Self-employment and informality

**Figure 24.1: Employment and growth - India vs the world**



<sup>1</sup> Figures in this section are build from the World Bank Indicators dataset and tables extracted from the appendices of ILO publication in 2018, relying on Indian surveys carried out in 2012.

<sup>2</sup> ILO in 1999 defines a multidimensional concept, decent work, that covers four dimensions as employment creation, rights at work, social protection and social dialogue.

Labour force in developing countries is growing under demographic pressures, which are especially acute in India whose population will reach 1.66 billion in 2050. Nevertheless, the evolution of labour force participation rate, here expressed as the ratio of the labour force over the population aged 15 and more, shown in figure 24.1 – right panel, is decreasing monotonically since 1991 and India shares this feature with the rest of the world, although the decrease is stronger in India since the mid-2000. Indeed, at the end of the period, barely one Indian over two participates in the labour market, whereas the worldwide average is over 60%. Employment (as a percentage of the population aged 15 and more) follows the same evolution, with a last value of 46%. The puzzling fact is that economic growth in India remains high, around 6%, compared to the worldwide average less than 3% and seems not translate into job creation or more job opportunities for India workers. Indeed the Indian employment elasticity<sup>3</sup> is equal to 0.23 over the period, which is lower than the worldwide value (0.39).

**Table 24.1: Education and labour market outcomes in India**

Education, %	1994	2000	2005	2010	2012	2018
Labor force (% of the working age population group with the same education)						
Advanced	72.3	69.2	67.3	62.7	63.2	59.9
Basic	56.5	55.8	56.9	54.3	51.6	48.9
Intermediate	51,6	50,7	52,7	45,5	43,7	40,8
Unemployment (% labor force group with the same education)						
Advanced	10.0	10.3	8.7	7.4	8.4	15.3
Basic	3.4	3.9	2.8	2.4	2.4	4.2
Intermediate	9.4	9.2	7.9	6.9	6.3	10.8

Source: WDI 2020

Moreover close values between employment and the labour force participation rate are not surprising as Indian unemployment (as a percentage of the labour force) remains stable around 5.5% for the whole period, 1991-2019. The world average of unemployment evolves less smoothly as in developed countries unemployment aligns more with economic conditions. A possible explanation of this divergence relies on the agent's choice between unemployment and inactivity according to her educational attainment. Indeed, labour force participation in India is higher among the advanced education group, suggesting that

<sup>3</sup> This raw calculation is obtained by estimating the OLS regression of the logarithm of the labour force on the logarithm of the GDP (PPP, constant 2017 US dollars).

unemployment rate should be higher also, as shown in table 24.1. For the basic education group, only one worker over two participates to the labour market, and in that case they rarely are unemployed. The intermediate education group behaves like the basic (resp. advanced) one in terms of labour force participation (respectively unemployment rate). Education is one of the pieces of labour segmentation, the more educated having better working conditions, and as expected offering more protection against the current of the Covid-19.

Another distinctive feature of labour markets in developing countries is the overwhelming weight of self-employment, having decreased over the period but remaining high at 86% in 2019, whereas the worldwide average is less than 50%. Figure 24.1 shows also that vulnerable employment, which includes own-account and contributing family workers, is very close to self-employment. As can be seen from table 24.2, the nature of vulnerable employment and hence self-employment itself in India are largely informal – e.g. without access to social security benefits, as 94.3% own-account and 100% contributing family workers are informal. Formal employment applies to less than 20% Indian workers, as the share of informal employment in total employment is 88.2%<sup>4</sup>. Again education is key to determine the allocation between formal and informal jobs, highlighting the trade-off between unemployment and inactivity according informality.

**Table 24.2: Informal employment in India (2012 Indian surveys).**

% (excluding agriculture)	In the informal sector	Outside	Total
Share in total employment	80.9 (64.3)	6.5 (12.2)	88.2 (78.1) <sup>a</sup>
Total employment	81.1 (64.7)	18 (33.7)	100.0 <sup>a</sup>
Urban	58.6 (64.3)	15.2 (12.2)	75.9 (74.1)
Own-account workers	94.3	0	94.3
Contributing family workers	98.8	1.2	100

**Source: ILO (2018) ; <sup>a</sup> : the difference is due to households. In brackets the corresponding percentages excluding agricultural employment.**

The last decades testify an increase in the informal employment in the formal sector – including registered incorporated firms, largely offsetting the corresponding decrease in the informal sector, with the share of total employment in and outside the informal sector respectively equal to 81.1% and 18.8%, the remainder working in households.

<sup>4</sup> The corresponding shares for the World and developed countries, reported in ILO (2018), figure 5, panel C, are respectively 61.2% (50.5%) and 18.3% (17.1%).

Consequently, looking at labour segmentation along the lines of self-employment and informality provides a very similar picture in India. Reducing informality in the labour market raises then the question of job destruction, as a majority of Indian workers is self-employed, or the issue of decent work. When discussing the impact of the pandemic on the future of work, it is then necessary to have in mind its impact on the nature and quality of jobs.

#### 24.2.2 Productive structure and informality

If we go further in the analysis of the labour market segmentation, economic sectors add information as they are more or less correlated to working conditions, as written contracts and/or access to social security benefits. Indeed, all around the world, agriculture experiments in average a large decrease in employment, the share in total employment starting at 60% and ending at 40%, over the period. The value added of agriculture as a percentage of GDP is rather low, declining slowly beyond and below 20%. In India, agriculture is then the biggest employer with the lowest productivity. Furthermore, agriculture provides the largest share of informal jobs, 48.6%, compared to the other sectors that contribute one quarter each to informal employment as can be seen in table 24.3.

**Table 24.3: Informal employment by economic sector in India**

%	Agriculture	Industry	Services
Share in total employment	99.7	81.4	77.6
Share in informal employment	48.6	25.1	26.4
Share in formal employment	1.1	42.6	56.3

**Source: ILO (2018).**

It does not necessarily imply that rural-urban migration in India helps escaping from informal employment, as the share of informal employment in urban areas remains high, at 75%. Indeed when excluding agricultural activities from employment, the share of informal employment in total employment is only barely different, at 78.1%. The change proves to be remarkable in the composition of informal employment across production units: 64% in the informal sector versus 33.7% outside (the remainder working in households). We can draw a first conclusion at this point of the analysis: if reducing agricultural share in GDP and employment is a necessary condition to improve job quality, it is not a sufficient one, which implies that urbanization maintains the actual profile of labour segmentation. Second, the

mutation of the productive structure, generally defined as the first step of the economic modernization, seems skipping the stage of industrialization in favor of tertiarisation. This could be dramatic as the industrial development, characterized by large scale production, is associated to the emergence of trade union and the implementation of employment law, ensuring more formal job opportunities. On the contrary, the switch to a service economy tends to threaten the bargaining power of workers in the employment relationship by encouraging self-employment and small production scales, and then deterring working conditions for more workers.

The economic survey 2019-2020 produced by the Government of India<sup>5</sup> produces a detailed description of the recent evolution of the services sector. Indeed, the hierarchy of industry and services in terms of employment (as a share in total employment) and value added (as a percentage of GDP) is approximately the same: the service sector is the most productive, reaching 50% of Indian GDP, which is lower than the worldwide average, whereas the industrial values added are similar. When looking at employment from the World Development Indicators, the picture is similar as the Indian service sector accounts for 30% in 2019, and the worldwide average being 50%. Growth rates are higher in India, reflecting the traditional catch-up phenomenon. The main driver of Indian GDP growth rate is clearly the services sector.

The key issue at this point is that the content of jobs in services is decisive to understand the impact of the COVID-19, now and in the future. Indeed the current response to the pandemic in the absence of a vaccine was the development of “working from home” strategy, which requires a high degree of digitalization in the production process, not encountered by all occupations.

### 24.3 COVID-19: changing labour segmentation?

The comparison of Indian labour outcomes with their worldwide counterpart helps to identify the nature of the market segmentation. If formality, e.g. access to a safety net protecting against negative shocks as income or job losses, remains a distinctive element of this segmentation when comparing developing and developed countries, it is more and more

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<sup>5</sup> See chapter 9 of volume 2,  
[https://www.indiabudget.gov.in/economicsurvey/doc/vol2chapter/echap09\\_vol2.pdf](https://www.indiabudget.gov.in/economicsurvey/doc/vol2chapter/echap09_vol2.pdf).



difficult to distinguish it from employment status. Indeed informal employment and self-employment seem overlap to the point of being confounded, and India is a good example of this. Indeed salaried employment, and formalization, grow with economic development and even if India has experimented higher growth rates in the last three decades compared to the worldwide average, a majority of her workers is self-employed and informal employment has not decreased. However, there is evidence of heterogeneity within the informal segment<sup>6</sup>, and hence among self-employed workers. The informal segment is composed of two tiers: the low tier includes a majority of wage-earners waiting for a formal job, the up tier a majority of self-employed workers having chosen voluntarily to be informal. This voluntary choice is explained by several factors: high human and financial capital, low quality of institutions and weak public good provision. Education and economic sectors will add on the design of the labour market segmentation: skilled workers are likely formal as economic sectors with capital-intensive production, requiring high-skill workers.

Finally, the borders between formal and informal jobs in one hand, and standard and non-standard jobs in the other hand tend to fade away: this evolution of labour segmentation could be associated to automation, leading to digitalization<sup>7</sup>. As the current state of the labour market in developing countries, where labour is abundant and capital scarce, is mainly driven by labour demand, we first argue that labour segmentation in its current form remains with stronger relevance, due to the substitution effect at work with digitalization. Second the outbreak of the pandemic has frozen or even deteriorated the position of the most vulnerable on the labour market, expanding segmentation.

#### 24.3.1 Recent Background: automation and the replacement effect

One of the major stylized facts on labour markets in developed countries is job polarization, which describes the decline in the share of employment in middle-wage occupations, compared to the rise or stability of this share in the 2 other occupations (low-wage and high-wage). Automation and off shoring due to globalization are the main explanations of polarization. Autor & Dorn (2013) assign it to automation and distinguish two forms of it: employment polarization - describing the sectoral change in occupations for low-skill workers (from industrial to service ones), and wage polarization, corresponding to the rising of

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<sup>6</sup> See the seminal paper of Fields, G. (2011). Labour market analysis for developing countries. *Labour Economics*, 18, S16–S22.

<sup>7</sup> Digitalization refers to labour transformation by automation-based technology.

earnings at the top and bottom of the distribution. For our purpose we will focus on employment polarization. For Autor (2015), the substitution mechanism at play in automation, especially for employment polarization, leads definitively to net job destruction. Automation generates also complementarities between capital and labour. This author predicts that the continuous thread of new technologies in AI will reinforce the substitution in favor of computers for routine tasks, while magnifying the need of labour for innovations. Acemoglu & Restrepo (2019) build on these substitute/complementary components a theoretical framework for understanding the effects of automation on labour demand. The re-allocation of production tasks to capital and labour as a result of automation is determined by two mechanisms. The first one, called displacement effect, deprives labour of some productive activities or tasks to assign them to capital. This substitution mechanism is well-known to increase labour productivity by reducing the labour share in value added, with a possible negative impact on labour demand. The second one, called reinstatement effect, reflects the job creation process associated to automation, given that the new productive tasks are assigned to labour because of its comparative advantage. Contrary to the displacement effect, it raises labour share and labour demand. The final impact of automation on the composition of production (tasks assigned respectively to labour and capital) and then on labour demand is unclear. From a welfare perspective, this result is secondary compared to the result on productivity. Productivity gains, that are expected in the case of automation, will improve wealth but the final wealth sharing and the inequalities issues depend on social and political institutions.

Acemoglu & Restrepo (2019) apply their framework to the US labour market over the period 1947-2017 and explain the growth of employment from the joint action of the displacement and reinstatement effects. They found that the substitution effect accelerates during the past three decades whereas the reinstatement effects weakens, leading to a slowdown of employment growth.

As Indian and US labour markets have in common to be flexible, and Indian economy being largely open to international markets, the prevalence of the displacement effect over the reinstatement one could explain the jobless growth in India as shown in the previous section. Moreover, in order for the job creation mechanism to outweigh the substitution mechanism, it requires rapid adjustment of workers skills to the new tasks as well as an efficient matching process on the labour market. Indian labour market does not complete these conditions as underlined by Chowdhury (2014). Indeed, she shows that the source of skill shortages in the Indian labour market could be explained by skill mismatches or allocative inefficiency. Skill

mismatch has two components: the lack of skills in the labour supply, and over-education, which corresponds, in employment, to the gap between the education attainment and the requirements of the job. This last component of skill mismatch reinforces the displacement effect: it increases the competition with high-skilled workers for jobs originally intended for less-skilled workers. If over-education is high in India, it could explain why the labour force participation rate of people with basic education is lower than the one of people with advanced education, as seen in the previous section.

Calvão et al. (2019) provides a picture of digital work in India. The authors update on the impact of the 4th industrial revolution on the Indian labour market, by looking at the changes in the retail sector, the growing space of tech-work platforms in managing services activities like driving, and the IT industry. Their main finding is the rising job insecurity caused by the digitalization process, even for the more educated workers in the IT industry, for whom formality is regular. The new threat on job opportunities is the reverse outsourcing as automation goes on replacing labour for an always larger range of tasks and induces foreign companies to go back home. This issue would worsen the over education phenomena by increasing the surplus of unemployed high-skilled labour.

Rising economic development does not keep all its promises in terms of job opportunities and improving living standards under the combined effects of globalization and automation. International competition among exporting firms and digitalization lead first to an increase in international and domestic labour demand but biased in favor of high-skilled workers, who could either migrate or stay home. Nevertheless this increase in job offers, especially obvious in the sector service, is far from satisfying the population needs. It changes the domestic wage distribution by magnify income inequalities. As digitalization deepens, employment polarization becomes more pronounced and decreases the upper tail of the occupation distribution, which cannot be replaced by capital. The ability of the Indian labour market to implement the reinstatement effect by creating new tasks and also solving the skill mismatch issue determines the future trajectory of employment along segmentation.

#### 24.3.2 The outbreak of the Covid-19

To understand the impact of the pandemic on labour market segmentation, we look at how it interferes with the logic of automation driving currently the employment path. The COVID-19 is an exogenous and common shock to all countries, resulting then in circular answers

from countries according to their social, economic and political singular conditions, as they are all related by global value chains. This productive dependence, as every country could differ in the number and intensity of tasks she performs along the global value chains, explains also the choice of policy measures to deal with the pandemic. For developing countries involved deeply in the global value chains, it is a matter of concern as developed countries could accelerate the end of offshore insourcing and outsourcing. According to the We choose to focus on the direct adjustment made by the labour markets following the outbreak of the pandemic, the predictions being conditional to some invariance in these global value chains. In the case of India, this assumption is not so strong as, according to Government of India (2020)<sup>8</sup>, India is characterized by lower participation in global value chains compared to the major exporting nations in East and Southeast Asia.

In most countries, the primary effect is a huge increase in unemployment. Some countries have resorted to short-time working or temporary lay-offs that were publicly funded - in whole and in part, as a buffer against the health crisis. Indeed, these policy measures allow a faster economic recovery by sustaining purchasing power and then consumption. For countries that decided to implement lockdowns, working from home, when the occupation allows it, is adopted, in addition or not to the unemployment measures. Then, identifying workers that are likely being unemployed provides a picture on how the pandemic could interact with the current state of the labour market as driven by digitalization. Kaplan et al. (2020) classify occupations in order to depict the heterogeneity in exposure to COVID-19 due to work. Social interaction, which captures the risk of having the COVID-19 due to employment, and flexibility, defined as the possibility to working from home, determine this sensitivity. Social interaction, as flexibility, could be high or low. The combination of these modes provide four groups of occupations. An additional group includes occupations considered as essential by local authorities, and they are characterized by low flexibility<sup>9</sup>. According to this classification, we can see that the pandemic magnifies the transition to unemployment or to informal jobs or inactivity in developing countries along the same lines than dualism; the standard result that education protects from unemployment is valid also for

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<sup>8</sup> See chapter 5 of volume 1,

[https://www.indiabudget.gov.in/economicsurvey/doc/vol1chapter/echap05\\_vol1.pdf](https://www.indiabudget.gov.in/economicsurvey/doc/vol1chapter/echap05_vol1.pdf).

<sup>9</sup> Examples of occupations are respectively nurse (essential), retailers (high social interaction but low telecommuting), engineers (low social interaction and telecommuting), teachers (high social interaction and telecommuting), software developers (low social interaction and high telecommuting).

the pandemic<sup>10</sup>. The typical profile of the worker whose activity is threatened by the pandemic combines low earnings, youth, low skills, temporary contract, service job like in the tourism sector.

Furthermore the pandemic fosters digitalization because a way to avoid disrupting business is working from home, which is a form of automation. Service jobs around and within the workplaces are then threatened. Here, a huge difference between developed and developing countries could be observed as working from home depends highly on IT infrastructure quality. Indeed, Garrote Sanchez et al. (2020) report that 1 job in 5 across the world offers telecommuting possibilities, this number decreasing to 1 in 26 in low-income countries. And this estimation is certainly an upper bound as it does not take into account internet access. Consequently, the impact of the pandemic on digitalization by this way is mitigated in developing countries, at least in the short run. In India, the service sector is characterized by a large spectrum of occupations and skills, from own-account workers, mainly informal to regular high-skilled workers, largely implied in IT occupations, meaning that the pandemic has heterogeneous effects on employment in service sector. Nevertheless, on average, the most popular worker profile in the service sector remains the first one. Indeed, for the Government of India (2020), job creation's strategy, due to India's comparative advantage in labour-intensive activities, relies on textiles, clothing, footwear and toys, exploiting rather unskilled labour and on network products, India specializing in final assembly, again requiring less skilled workers. Firms could also react to the casual shortage of labour supply provoked the pandemic by fostering. This investment may prove to be irreversible, even with the end of the pandemic, challenging again job opportunities.

#### 24.4 Concluding remarks

Predictions on the future of work and labour segmentation in developing countries could be made even if the uncertainty on the duration of the pandemic remains high. The trajectory of employment will not be changed structurally given that global value chains become resilient to the pandemic, the current main drivers staying on move. Demographic pressures, employment shortages and automation will remain relevant, at least in the short run, to explain the dynamics of labour supply and labour demand. Even if working from home will

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<sup>10</sup> For example, for the US labour market, Kaplan et al. (2020) find that workers with high social interaction occupations and low possibility of working from home are also the more vulnerable to negative income risks.

not spread as fast as in developed countries, it will be adopted questioning the relevance of service jobs depending on workplaces and their relocation. Autor & Reynolds (2020) point out that their confidence on automation to create more jobs than workers to fill them has been shaken by the outbreak of the COVID-19 on the US labour market. For developing countries, the global picture of labour segmentation before and after the pandemic remains oddly stable, primarily governed by self-employment. The recovery from the pandemic could be then designed on well-known policy programs as the one for decent work. Nevertheless any sizable change in the global value chains could rend null and void the invariance of employment trajectory in the long run.

At the moment of chapter's publication, uncertainty remains high about the future of work in the world and in India in particular. ILO (2021) develops two scenarii, one optimistic and another one more pessimistic, highlighting the heterogeneity of the recovery among countries. The pandemic results in divergences in the evolution in total employment and by economic sectors across countries. Common thread, however, is that low-paid employment experienced greater job destruction, and self-employment paid the heaviest price to the pandemic, which again questions the future of informality. Some Indian economists, as Ashwini Deshpande<sup>11</sup>, worry that India's annual Budget misses the point on income support, especially to reduce the huge gap between paid and self-employed workers. This kind of policy measures, according to ILO (2021), explains most of the differences of the pandemic impact on national labor markets and the success of their recovery.

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<sup>11</sup> Missing in Budget: Push for jobs, welfare. *The Indian Express*, February, 2, 2021.

## References

Acemoglu, D. & Restrepo, P. (2019). Automation and New Tasks: How technology displaces and reinstates labor. *The Journal of Economic Perspectives*, 33(2), 3-30.

Acemoglu, D. & Autor, D. (2011). Skills, tasks and technologies: Implications for employment and earnings. In O. Ashenfelter & D. Card (Eds), *Handbook of Labor Economics, Volume 4b* (pp. 1043–1171). Elsevier.

Autor, D. & Reynolds, E. (2020). The nature of work after the COVID crisis: two few low-wages jobs. The Hamilton project - brookings.

Autor, D. (2015). Why Are There Still So Many Jobs? The History and Future of Workplace Automation. *Journal of Economic Perspectives*, 29 (3), 3-30.

Autor, D. & Dorn, D. (2013). The Growth of Low-Skill Service Jobs and the Polarization of the US Labour Market. *American Economic Review*, 103 (5), 1553-97.

Calvão, F. and Thara, K. (2019). Working futures: the ILO, Automation and digital work in India. *International Development Policy*, 11, 223-246.

Chowdhury, S. R. (2014). Skill Mismatches in Indian Labour Market: Policy Priorities & Challenges Ahead. *The Indian Journal of Industrial Relations*, 422-438.

Government of India (2020a). Economic Survey 2019-2020. New Delhi: Ministry of Finance, Department of Economic Affairs, Economic Division.  
<https://www.indiabudget.gov.in/economicsurvey>.

Garrote Sanchez, D., Gomez Parra, N., Ozden, C., Rijkers, B., Viollaz, M. & Winkler, H. (2020). Who on Earth Can Work from Home. World Bank Policy Research Working Paper 9347.

ILO (2021). ILO Monitor: COVID-19 and the world of work.  
[https://www.ilo.org/wcmstp5/groups/public/@dgreports/@dcomm/documents/briefingnote/wcms\\_767028.pdf](https://www.ilo.org/wcmstp5/groups/public/@dgreports/@dcomm/documents/briefingnote/wcms_767028.pdf)

ILO (2018). Women and men in the informal economy: a statistical picture.

[https://www.ilo.org/global/publications/books/WCMS\\_626831/lang--en/index.htm](https://www.ilo.org/global/publications/books/WCMS_626831/lang--en/index.htm)

Kaplan, G., Moll, B. & Violante, G. (2020). The great lockdown and the big stimulus: tracking the pandemic possibility frontier for the US. NBER Working Paper 27794.