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Article

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Does working from home work in developing countries?

Infrastructure constraints are major obstacles for working from home in developing countries

Keywords: work from home, infrastructure and services constraints, work-life balance, productivity, income inequality

ELEVATOR PITCH

Work-from-home possibilities are lower in developing than in developed countries. Within countries, not all workers have equal chances of transitioning from the usual workplace to work-from-home. Moreover, infrastructure limitations and lack of access to certain services can limit the chances of effectively working from home. Having a home-based job can affect, positively or negatively, work-life balance, levels of job satisfaction and stress, and productivity. The differential chances of working from home may end up increasing the levels of income inequality between workers who can and those who cannot work from home.

KEY FINDINGS

Pros

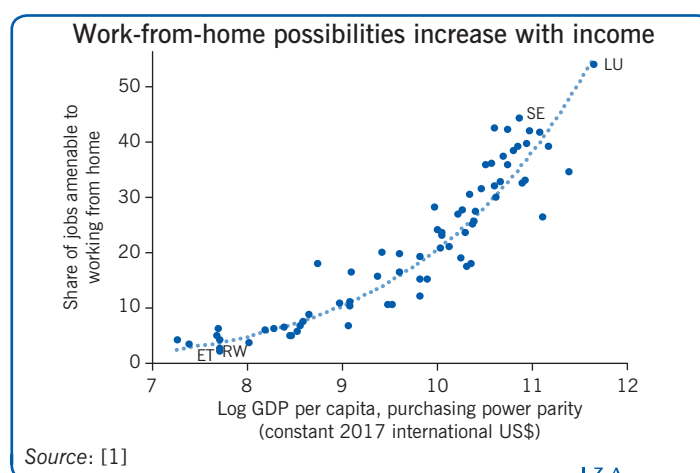
- ⊕ Working from home can improve workers' work-life balance through reduced work-family conflict, increased control over the timing of work, or reduced commuting time, according to evidence from developed countries.
- ⊕ Job satisfaction can increase due to working from home, in certain contexts.
- ⊕ In certain occupations, productivity can increase while working from home, for instance, because of the convenience of being at home and its relative quiet.

Cons

- ⊖ Low-educated and low-paid workers have lower possibilities of working from home than high-educated and high-paid workers.
- ⊖ Infrastructure and services constraints negatively affect the chances of working from home, especially in developing countries.
- ⊖ In the longer-term, productivity may decline when working from home due to the loss of information and knowledge spillovers that would normally occur between workers when interacting face-to-face.
- ⊖ The differential chances of working from home may result in income inequality increases between workers who can and cannot work from home.

AUTHOR'S MAIN MESSAGE

Work-from-home possibilities increase with the income level of countries and low-educated and low-paid workers have fewer chances of working from home. Moving to a more general work-from-home strategy in developing countries will require removing infrastructure constraints, such as lack of access to internet at home. Although working from home can improve workers' work-life balance and job satisfaction, negative impacts on productivity and income inequality are possible. A hybrid setting, where workers work from home a few days a week, is the more appropriate policy option because it preserves the benefits of working from home while mitigating or avoiding altogether the associated costs.



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MOTIVATION

Working from home (WFH) is becoming a common work arrangement, especially since the start of the Covid-19 pandemic. Home-based work can bring several benefits for workers, employers, and governments. Workers may value the possibility of WFH to improve work-life balance and save commuting time. Employers may be willing to offer a home-based work option to attract and retain workers, increase their productivity, or reduce office space and costs. Government may be interested in promoting jobs with space flexibility to reduce pollution and traffic congestion. However, WFH also has a gloomy side. Workers may suffer higher levels of stress and the lack of interaction with coworkers may result in reduced productivity.

Beyond these potential benefits and disadvantages of WFH, it is important to consider that not all workers have equal possibilities of moving their jobs from the usual workplace to home, especially in developing countries. The chances depend, among other factors, on the occupation workers have, which, in turn, relates to their individual characteristics, such as gender, age, and level of education, and where they live. A possible implication of the differential chances of WFH is the increase in the levels of income inequality between workers who can and those who cannot work from home.

DISCUSSION OF PROS AND CONS

Who can work from home?

Workers in developing countries have lower chances of WFH than workers in developed countries and the gaps are large. The Illustration on p. 1 shows a clear positive relationship between the share of jobs that can be done from home and the level of GDP per capita. While the share of home-based jobs in countries such as Ethiopia and Rwanda is below 3%, it reaches more than 40% in more developed economies such as Luxembourg and Sweden.

There are several reasons for these gaps. First, countries differ in their occupational structure of employment. Services and sales occupations and elementary occupations, such as construction helpers, are jobs with low WFH possibilities and account for a much larger share of total employment in low- than in high-income countries. In contrast, managerial and professional occupations, which are more amenable to WFH, are more prevalent in developed countries.

Second, countries also differ in the task requirements of each occupation due to differences in the organization of production and in the level of technology adoption. Jobs in developed countries are more intensive in cognitive and interpersonal tasks, such as advising people, which can be compatible with WFH. On the contrary, in developing countries jobs are more intensive in routine or physical and manual tasks, such as operating industrial equipment, which are less amenable to WFH. An implication of the different task requirements across countries is that the same occupation can be more amenable to WFH in a developed than in a developing country.

Finally, besides the type of occupation, infrastructure characteristics and inputs, such as space availability and home internet access, can impose a constraint to the possibilities of performing a job effectively from home. For instance, workers in occupations such as

call centers would be able to do their job from home if they had access to the appropriate technology, but in developing countries only some workers have home internet availability.

There is also evidence on the correlation between WFH possibilities, the size of the informal sector, and the share of self-employed workers in total employment in each country. The correlation between the share of informal workers—wage employees who are not entitled to pension benefits when retired—and WFH possibilities across 11 Latin American large cities is negative and strong [2]. Self-employed workers have lower WFH possibilities in comparison to wage employees and their share in total employment is much larger in low- than in high-income countries [3], [4]. Behind these two results are the occupations where informal and self-employed workers are usually employed. For instance, self-employed workers in poor countries tend to be employed in occupations with low WFH amenability, such as elementary and services and sales occupations, while in rich countries the occupational composition of self-employed workers is close to that of the aggregate economy.

An important characteristic of labor markets in less developed countries is the high share of agricultural employment. WFH possibilities of agricultural workers in developed countries are very low. However, in poor countries, agriculture activities are less intensive in technology and farms are smaller. If plots are adjacent to workers' homes, WFH might be possible for agricultural workers. Evidence on the possibilities of agricultural workers WFH is only partial and not conclusive [1]. For a set of middle- and high-income countries, agricultural employment is less amenable to WFH in countries with lower income levels. Another piece of evidence based on a sample of countries from low- to high-income levels, shows that if it is assumed that all agricultural workers can work from home, the relationship between the share of jobs that can be done from home and GDP per capita becomes negative.

Other interesting findings appear when looking at WFH possibilities within countries. First, the positive association between development and the share of home-based jobs that is observed across countries is replicated when comparing regions of the same country [1]. Second, WFH possibilities are larger for workers with higher earnings and, although positive, this association is less pronounced in less-developed countries. Finally, WFH possibilities vary with workers' characteristics. There is agreement on the lower WFH possibilities of low-educated workers in comparison to workers with high levels of education [1], [2], [3], [4], self-employed workers in comparison to wage employees [1], [3], and informal workers with respect to formal workers [3], [4]. These findings appear both in developed and developing countries. Regarding age and gender, the evidence is not conclusive and depends on the countries analyzed. Young workers (15–24 years old) in Mexico and India are less likely to work from home than adult workers [1], but the opposite relationship has been reported for a set of ten low- and middle-income countries [3]. Women have more possibilities of working from home in the same set of ten low- and middle-income countries [3], but there is no gender difference for a set of 11 Latin American large cities [2]. Differences in WFH possibilities by workers' characteristics can be explained by differences in the occupations workers have [1], [2], [3], [4] and by differences in the tasks performed at work even in the same occupation [3], [4].

The findings described above remain unchanged when using the percentage of people who *actually* work from home instead of a measure of WFH possibilities, both in developed

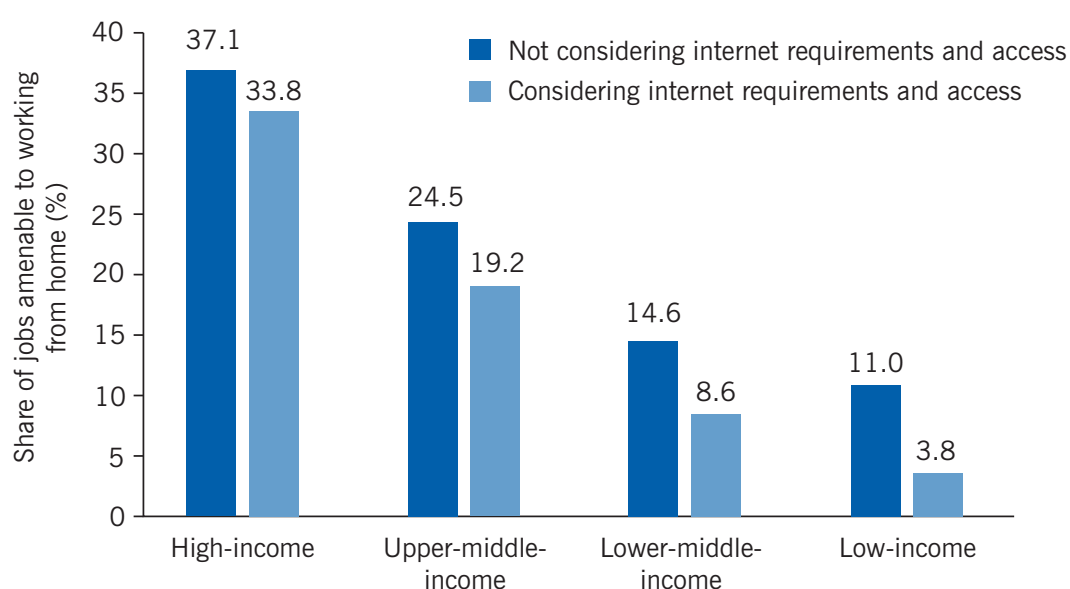
and developing countries. Evidence is not extensive because data on the number of home-based workers is rare, but it indicates that both measures—actual and predicted percentage of workers who work from home—are close. Moreover, findings for Brazil and Costa Rica show that the percentage of people who actually work from home is larger among high-educated workers and wage employees, and for managers and professionals than in lower-paying occupations, such as elementary jobs [3].

The role of infrastructure and services constraints

Other determinants of WFH possibilities are related to the infrastructure characteristics of the dwellings where workers live, such as electricity access, internet access, or the availability of an adequate physical space. An immediate consequence of considering such characteristics is that a job that is compatible with WFH on paper may not be able to be performed adequately by workers facing poor infrastructure conditions.

The consideration of jobs' internet requirements and residential access to internet services makes a big difference when calculating the share of jobs amenable to WFH, especially in poorer countries. Figure 1 shows the percentage of jobs that can be done from home when information and communication technology requirements and internet access constraints are taken into account and when they are not. As was previously described, the share of jobs amenable to WFH increases with the development level of countries. In high-income countries, 33.8% of jobs are compatible with WFH while in low-income countries, only 3.8% are—equating to a ratio of 8.9 between high- and low-income countries. If internet requirements and internet access restrictions are not considered these figures would be

Figure 1. Home internet access is a harder constraint for poorer countries



Source: Garrote Sanchez, D., N. Gomez Parra, C. Ozden, B. Rijkers, M. Viollaz, and H. Winkler. "Who on earth can work from home?" *World Bank Research Observer* 36:1 (2021): 67–100 [1].

37.1% in high-income countries and 11.0% in low-income countries—a ratio of 3.4 [1]. This finding reveals that less-developed countries not only have fewer jobs amenable to WFH, but internet access is a much harder constraint for them.

Another way of illustrating the restriction imposed by not having home internet access is comparing internet usage at work with the availability of an internet connection at home. Countries such as Mexico, Peru, and Ecuador rank close to the average of a group of middle- and high-income countries in terms of internet use at work, but they lag in terms of internet access at home. As a result, WFH possibilities are lower in these three Latin American countries than in the others [4].

Home internet access is not the only infrastructure restriction workers may face. Not having sufficient physical space, such as a private room to use as a home office, also acts as an obstacle. The percentage of jobs that are amenable to WFH in 11 large Latin American cities is 25.8% when not considering internet access and space restrictions. When home internet availability is taken into consideration, the percentage drops to 19.2%, and when adding access to adequate space there is an additional reduction to 14.5% [2].

Infrastructure and services restrictions affect demographic groups differently [2]. When none of these restrictions are considered, men and women have very similar chances of WFH in the same group of 11 Latin American cities. When these restrictions are considered, the share of jobs amenable to WFH becomes larger for men than for women, that is, women are more likely to live in crowded houses and to lack internet connectivity than male workers in these cities. When the comparison is made across educational groups, the disadvantaged situation of low-educated workers increases as more restrictions are imposed.

What are the benefits and costs of working from home?

The knowledge about the potential benefits and costs of WFH in developed countries is extensive, but rigorous evidence for developing countries is limited.

Work–life balance, job satisfaction, and job stress

The benefits workers perceive when WFH are related to the possibility of balancing work with personal life. The evidence for developed countries points to a positive association between WFH and work–life balance as reported by employees. Improved work–life balance can take the form of reduced work–family conflict, increased control over the timing of work, reduced commuting time and associated costs, or a more equitable division of household responsibilities [5], [6], [7]. The available evidence for developing countries refers to the pandemic period in Latin America and indicates a negative association between WFH and work–life balance that is mediated by high stress levels [8].

WFH may result in longer working hours negatively impacting the levels of job satisfaction and stress and, eventually, work–life balance. The longer working hours while WFH can be related to the substitution of working for commuting time and to irregular schedules, including being on-call during evenings, nights, and weekends. The evidence for developed

countries, however, is not conclusive. Studies analyzing the Covid-19 period show that people working from home allocated part of their saved commuting time to their primary job and increased their working hours [9]. Studies analyzing pre-pandemic periods show that the reduced commuting time leads to a reduction in working hours or to a lack of effect on them and to more leisure time [5].

Job satisfaction, both in developed and developing countries, can also be negatively affected by irregular schedules, a lack of face-to-face social interactions and increased feelings of loneliness while working from home [8]. In fact, some home-based workers, given the choice, may decide to work from their employer's premises [10]. However, other studies have documented a positive relationship between WFH and job satisfaction [10]. A positive relationship can be explained by the possibility of deciding not only where but when to work, allowing people to meet family-related responsibilities, and by reduced unplanned interruptions. The positive and negative effects of WFH on job satisfaction can be reconciled through an inverted U-shaped link, where job satisfaction increases when the number of hours doing home-based work is low and declines at higher levels. In line with this idea, evidence from during the pandemic for developed countries shows that most workers would like to move to a hybrid arrangement, working from home between two and three days a week.

WFH can also have an impact on levels of stress. The evidence for developed countries points to higher levels of stress for wage employees when WFH in comparison to working in the workplace and regardless of when the work is done—weekdays or weekends/holidays [11]. The reasons for experiencing higher levels of stress are related to the need to integrate work and family activities. In fact, people with young children and in low-paid work suffer higher levels of stress while WFH. For developing countries, stress level has been proposed as a mediator factor to explain negative associations between home-based work, work-life balance, and job satisfaction during the Covid-19 pandemic [8].

Productivity and income inequality

The impacts of WFH on work-life balance, job satisfaction, and job stress may end up affecting labor productivity. The available evidence on the relationship between home-based work and productivity is not conclusive. The diversity of findings seems to depend on the characteristics of occupations and industries being analyzed. For instance, workers in large and noisy offices can get easily distracted; WFH may mitigate such distractions and thereby increase productivity.

A positive connection between WFH and labor productivity has been reported for home-based workers from a Chinese travel agency [10]. The change in productivity came from the convenience and relative quiet at home which led to higher levels of effort and efficiency in comparison to working at the office. Similar results have been found for a company in the multi-utility sector in Italy for both white- and blue-collar workers who WFH once a week [7]. Evidence for Latin America shows higher levels of productivity while WFH during the pandemic in comparison to on-site work in the pre-pandemic period, but the productivity gains fade away with high levels of stress [8]. Mixed results are also possible, which highlights the importance of the type of tasks performed in the sector or occupation being analyzed to understand the productivity implications of WFH. Results from a laboratory experiment in the US point to increases in productivity for home-based

workers performing creative tasks and reductions for those performing dull tasks [12]. Moving to the negative impacts of WFH on productivity, studies reporting these results have indicated that the reasons are related to reduced uninterrupted working hours at home, some tasks not being able to be performed at home, a poor telecommunication environment, and loss of face-to-face interaction with coworkers [9]. In fact, the lack of face-to-face interactions in the workplace has been presented as one of the main longer-term impacts of an extensive WFH strategy. The loss of knowledge and information spillovers among skilled workers in the workplace may harm the productivity growth associated with agglomeration economies [6].

The differential productivity impacts of WFH by occupation, type of tasks, or worker educational level have encouraged research into potential impacts on income inequality in a more general WFH setting. If some workers are more “protected” against productivity losses and these are the workers with higher WFH possibilities, that is, high-skilled and high-paid workers, income inequality may increase [6], [13]. Inequality may increase as well because workers with higher WFH possibilities usually demand low-skilled services in business districts, such as food and personal services. If these workers move to a home-based work modality in the same city, leave for locations outside the city, or stop doing inward commuting, the demand for low-skilled services will decline [13]. Evidence from developing countries shows that during the pandemic, workers with lower chances of WFH—workers with low education and income levels—faced higher chances of losing their jobs, which could potentially increase the levels of income inequality [1].

LIMITATIONS AND GAPS

Rigorous evidence on the potential benefits and costs of WFH in developing countries—its association with work–life balance, job satisfaction and stress, productivity, and income inequality—is limited. By contrast, knowledge about these relationships in developed countries is abundant. However, such evidence is not necessarily informative for countries with lower levels of income when considering their different sectoral and occupational structures of employment and the higher shares of informal and self-employed workers in total employment. In addition, agricultural employment in low-income countries is important and there is no direct evidence on WFH possibilities for agricultural workers in low-income economies.

Regarding infrastructure and services constraints to WFH possibilities, there are several that have not been considered when calculating the WFH possibilities, usually due to data limitations. Internet quality may be a restriction for occupations requiring access to internet services. Having a quiet environment, besides an appropriate physical space, can be important as well. For less developed countries in particular, access to basic services such as electricity or water may impose a restriction on WFH possibilities.

SUMMARY AND POLICY ADVICE

WFH possibilities decline along with a country’s level of development. Within developing countries, and in developed countries as well, low-educated workers and those with lower income levels are generally employed in jobs less amenable to WFH. The infrastructure characteristics of the dwellings where workers live also matter. Workers without access

to internet services and workers without an appropriate working space have lower possibilities of WFH than workers who are employed in the same occupation and have access to such infrastructure and services. The scarce evidence in terms of the potential benefits and costs of WFH in developing countries shows increases in productivity, results that might be related to the type of occupations analyzed, and mixed results in terms of work-life balance, job satisfaction, and job stress.

If a more general WFH strategy is implemented in developing countries, the share of workers able to switch to a remote setting will be small. Removing infrastructure and services constraints, such as the lack of home internet services, would improve this share. Although evidence on the effects of WFH on income inequality in developing countries refers to the pandemic period, the same type of effect can be expected in a scenario where WFH is the norm once the pandemic ends. Workers who can work from their homes will reduce the demand for low-skilled services provided in areas where they had their previous workplace. Although researchers do not know how these forces will play out in the long term, it is safe to say that workers in low-skilled services, occupations less amenable to WFH, will face an immediate impact through income reductions and potential job losses.

Moving to a hybrid WFH setting, where workers work from home some days a week, seems to be appropriate to avoid drastic impacts on income inequality and the potential negative effects on productivity while maintaining the benefits in terms of increased work-life balance and job satisfaction. Additionally, labor regulation will need to be adjusted to fit a more flexible world of work.

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Competing interests

The IZA World of Labor project is committed to the IZA Code of Conduct. The author declares to have observed the principles outlined in the code.

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