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Perspectives

The effect of reducing wages of remote workers on society. A preliminary assessment

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Abstract:

Remote work has represented 'the' alternative to office work during the COVID-19 pandemic as it has (while enabling employees to fulfill tasks from home) prevented or broken contagion chains. Though not a new approach to work, the recent emphasis on telework has come with pleas to reduce the wages of remote workers. By means of a logical-analytical approach, the article analyzes why such policies are not only unjustifiable in terms of keeping average wages at an at least stable level, but even more if the final sales prices would not shrink accordingly and would boost the share of corporate profits to GDP. Even cutting wages and final sales could be "deflationary" first and "recessionary" then (i.e., impoverish the economy). The article preliminarily analyzes the economic impact of such proposals on countries with a large ICT sector contributing to GDP (i.e., where remote work is facilitated due to the wide diffusion of tools such as Internet connections, computer devices, etc., enabling it) and an underperforming labor market in terms of female participation.

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1. Introduction

1.1. Remote work before and after COVID-19

The COVID-19 pandemic has shed unprecedented light on remote work, which incidentally is not a recent discovery (Nilles et al., 1976; Olson, 1983). Available evidence diffusely suggests that remote work can boost productivity as it may, for instance, contribute to work-life balance (Lashawn Johnson-Hoffman, 2019), although a clear distinction between remote work under usual (i.e., non-pandemic) and exceptional (i.e., pandemic) conditions

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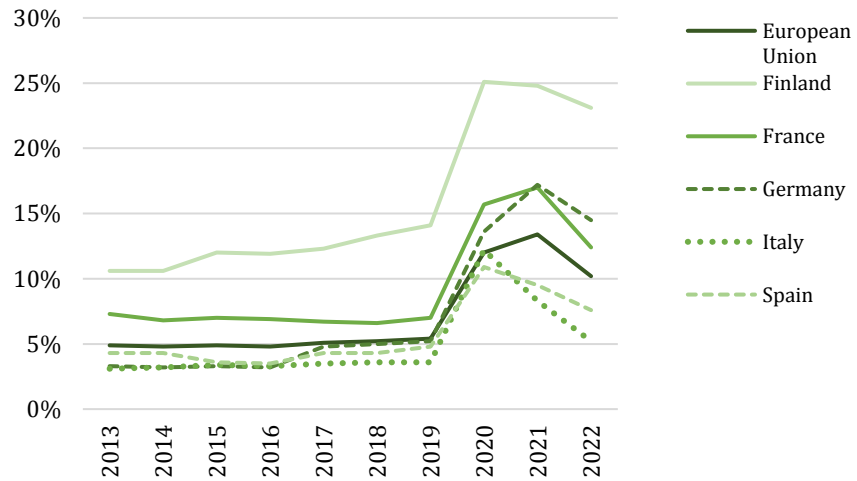
should be drawn. In the first case it can be assumed that work-life balance might be easier to reach, while in the second one the "life" side might be significantly reduced because of lockdowns and contagion risks from leaving home. This necessary distinction might explain why recent studies have remarked its potentially disruptive impact on work-life balance too (World Economic Forum, 2021). More recent studies by McPhail et al. (2023) and Türkes and Vuță (2022) point out instead that remote work is likely to gain further diffusion even in non-pandemic times.

Clearly, COVID-19 has changed the work of individuals, with – just for the sake of example – 72.2 million US employees teleworking in week 32 of 2021 (US Census Bureau, 2021). Moreover, it can be argued with economic logic alone that the shift from physical to remote work has prevented the world GDP from crumbling by more than 3.1% as it did in 2020 (The World Bank, 2023a). Since the International Monetary Fund (2023) is estimating its recovery at 3.4% and a significant share has been evidently supported by millions of employees partially or entirely working from home, it is safe to argue that remote work has actively mitigated the impact of the world recession in 2020 (Marcus, 2022).

This has been a lesson learned from the necessity of saving lives by staying at home and, at the same time, of continuing economic business. More recently, the "business-as-usual approach", which has been so far reluctant to embrace remote work because of its potential communication and control issues within companies (Silva et al., 2019), has actively induced an increasingly complete return to work in presence (Bloomberg.com, 2021), as if barely any lesson should have been drawn from the big "field experiment" conducted in 2020 and 2021.

Figure 1 – *Share of employed persons (15-64 years) working from home in selected European countries (2010-2022)*

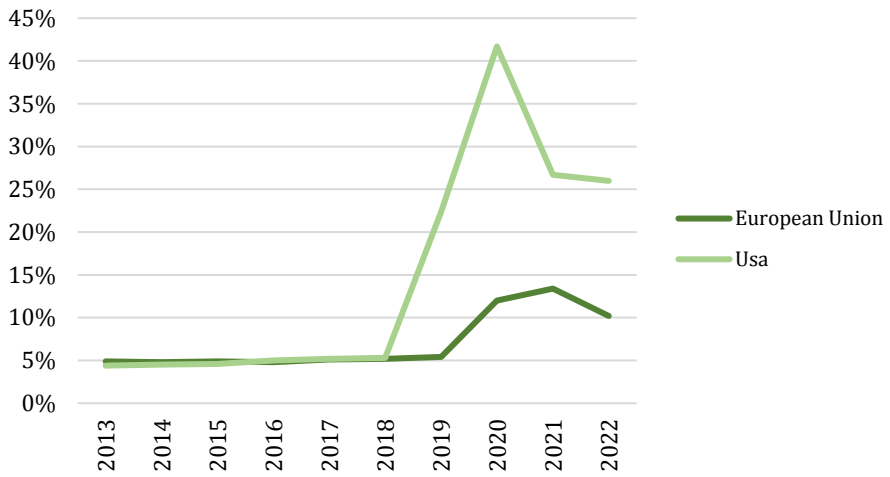


Source: Eurostat (2023a).

In fact, the share of employed persons (15-64 years) working from home in several European countries has remained almost stable from 2010 to 2019 (5.1% on average) while it "forcibly" skyrocketed in 2020 (12.0%) due to COVID-19 (figure 1). For an analysis more in detail, see the appendix (table A1). Being forced by exponentially rising contagion numbers to

reformulate a consolidated (mostly onsite) approach to work into a new (mostly offsite) one within a couple of weeks has represented a potentially disruptive paradigm shift, which could have been prevented if policymakers and employers had previously been more proactive towards remote work. Otherwise formulated, turning a mostly onsite work model into a partially offsite one within a few weeks is somehow "legitimated" to generate distress. However, such an effect could have been reduced well in advance if remote work before COVID-19 had been not an exception but rather an incentivized opportunity. By doing so, some workers would have been already accustomed to it but, also, office resources and/or tools would have been more digitalized to make them accessible from outside the office. In fact, the Digital Revolution as well as climate-change and sustainability issues existed before the pandemic, and authors like Mitter (2000) concluded more than two decades ago that "teleworking could contribute to sustainable development only when the economic, social and cultural contexts of the people concerned are sensitively taken into account".

Figure 2 – *Comparison of the share of employed persons (15-64 years) working from home in the European Union and the United States (2010-2022)*



Source: Eurostat (2023a) and US Bureau of Labor Statistics (2023).

Interestingly enough, the United States has made a more significant use of remote work during COVID-19 than the European Union, as figure 2 shows. While it is not the scope of the present Perspectives article to explore why the percentage gap between the United States and the European Union has reached 29.7% in 2020 (i.e., the first waves of the pandemic), it should be noted that the former were already more prone to remote work than the latter before the COVID-19 outbreak: already in 2019, in the USA, there was observed a further consolidation of telecommuting, notably thanks to implementations in the public administration. Whether this result is the consequence of an economic environment like the US American one that is particularly active in incentivizing investments in new technologies exceeds the scope of this article (although it seems very likely). Furthermore, while remote work is not a "one-size-fits-all solution" (as work typologies significantly differ from each other), it should have been already implemented before COVID-19 whenever feasible and with sufficient preparation time.

In this regard, table A2 in the appendix shows the sectoral differences in terms of adoption of remote work for the years 2019 (i.e., pre-COVID-19) and 2020 (i.e., post-COVID-19) in the above-mentioned European countries (i.e., Finland, France, Germany, Italy and Spain).

1.2. Wage cuts of remote workers from a factual and legal perspectives

In the present article, we critically assess from a logical-analytical perspective a recent "reinterpretation" of remote work according to which home workers should be paid less because they don't have to commute to their respective workplaces (Hobsbawm, 2022). Recently, Barrero et al. (2022) have found that "38 percent of firms expanded remote-work opportunities over the past year to moderate wage-growth pressures, and 41 percent expect to do so in the coming year". According to the 2023 Compensation Best Practices survey carried out by Payscale (2023), gathering 4,933 responses from October 2022 through December 2022, respondents replied to the question "do you have a pay strategy that encompasses a remote or distributed workforce" in the following ways:

- 39% responded to "no, we pay everyone the same according to one location";
- 18% responded to "yes, we set pay based on market pricing for each employee's location";
- 14% responded to "yes, we apply geographic differentials (+/- a percentage) to a benchmark for each employee's location";
- 12% responded to "we have a mixed strategy that varies by occupation or job family";
- 11% responded to "yes, we group similar markets into pay zones and use either market pricing or geo differentials to set pay for each pay zone";
- 3% responded to "yes, we approximate using data we can find or by calculating cost of living differences";
- 3% responded to "other".

Moreover, it has to be noted that remote work is already often subject to some (more or less pronounced) wage cuts because it enables employees to carry out their tasks offsite. Furthermore, a debate is developing on the suitability and legitimacy of differentiating between the wages of offsite and on-site workers, and numerous contributions in the literature are emerging – especially, with regard to regulatory adjustments in the labor market in the United States and Europe. On one hand, Barrero et al. (2022) estimate the braking effect – by approximately 2% – that remote work may have on wage growth pressures in the United States over the next two years. On the other hand, Pabiliona and Vernon (2022), who examine wage and hourly differential trends between full-time remote workers and on-site workers, observe that remote workers earn higher wages than on-site workers. For remote workers, real wages grew 4.4% faster than the average of their respective professional groups. In the United States, the absence of strict regulations has, however, also allowed for experiments in terms of wage cuts of remote workers and, in general, of those working in places where the cost of living is lower than in major urban centers (where main offices are mostly located). For instance, Kaye (2021) indicates that major Silicon Valley companies such as Facebook, Google, and Twitter are experimenting with different compensation policies based on whether employees work on-site or off-site and even based on their residential distance from the office. By doing so, they use an algorithm that calculates compensation based on the employee's residence and theoretical relocation costs. Projections, as we have previously pointed out, show that a remote worker living in Stamford would be paid 15% less than a colleague in New York City, but they also highlight potential differentials of 5% to 10% in the Seattle, Boston, and San Francisco areas (Brinatti et al., 2021).

With specific regard to Europe, Vargas Llave et al. (2022) have recently analyzed the regulation of remote work in different European Union countries and its evolution following the pandemic. In particular, there is still a lack of general coordination, and different approaches to the issue prevail (Smit et al., 2020; Piroşcă et al., 2021; Milasi et al., 2020). EU member countries can be grouped into two main categories: those where collective bargaining dominates (especially, in the Northwestern part) and those where state legislation is more prominent (especially in Eastern Europe). Nevertheless, most EU countries have specific legislation on remote working, complemented by cross-sectoral and company-level collective agreements. After comparing state legislation and collective bargaining regulations, it is possible to identify different clusters of countries. With the sole exceptions of Greece (where sectoral agreements on remote work are still underdeveloped) and Ireland and Cyprus (which have adopted a "market-oriented" governance approach predominantly characterized by unilateral employer decisions and individual agreements), there is a widespread regulatory framework in place, which ensures equal treatment in terms of salary, taxation and working hours between remote work and equivalent in-office positions. Moreover, in Italy, remote work is regulated by Law No. 81 of May 22, 2017, which is in line with what was mentioned earlier and confirms the obligation of wage parity for roles and tasks regardless of the location where they are fulfilled (i.e., whether employees are at home or at the company's premises (Barabaschi et al., 2022)).

Yet, from a legal point of view, the issue of wage inequality is influenced by the different legislation and policies in a given country or jurisdiction. In the EU, there has been a growing awareness and production of legislation on wage discrimination, on gender discrimination in particular. Indeed, Directive (EU) 2023/970 aims to enshrine the right to equal pay for men and women doing the same work or working for an equal value. The EU's main objective is not to affect the standardization of wages applied by individual national systems but to ensure that companies (whether public or private) guarantee gender pay equality through transparent wage-setting criteria. This legislation is explicitly dedicated to the problem of gender pay differences; but it could also provide support to a new stream of legal literature on discrimination of other kinds (e.g., territorial) and between on-line and off-line workers whenever tasks have been proven to be of "equal value". Indeed, the above-mentioned directive provides for more general methodological indications to be applied. In fact, it sanctions the obligation for companies to make accessible the criteria used to determine salaries, pay levels and economic progression. Whilst gainfully employed, employees must be able to acquire information on their own salary level and the average remuneration received by colleagues performing similar or equally valuable tasks; this applies when considering wage differences between economic territories (for instance, the Northern and Southern parts of Italy) and unequal pay between in-person and remote workers. It must be noted, however, that the former already represents a *vexata quaestio.* The two orders of reason that represent the grounds for a pay differential based on geography are – in real terms – economic efficiency and equity alone. Notwithstanding, in the Italian case a certain resemblance in the value-added per employee between regions in the Northern and the Southern parts has been also noted. With the size of the urban centers being equal, the cost of living does not exhibit any significant variations (Daniele, 2019). Moreover, the remote worker's home is often not too far from the location of the company – especially in the case of shifts from in-person to remote presence during the employment relationship – so that applying differentials on the basis of the same assumptions could be justifiable.

1.3. Aims, scope and methodology

In this specific regard, we show why average wages and GDP but also consumption expenditures and tax revenues might suffer from wage cuts for remote workers. Furthermore, we preliminarily analyze a set of countries ranging from Europe to India and the United States that are characterized by an ICT sector significantly contributing to GDP and an underperforming labor market in terms of female participation. Our selection is relevant insofar as – in countries with a strongly value-adding ICT sector – remote work is facilitated due to the wide diffusion of tools such as Internet connections and computer devices, which ultimately make it possible. Moreover, remote work appears to be a valid tool to enable female participation in the labor market. While reducing the wage of a specific category of worker might seemingly affect only that one, we conclude that, whenever a sufficiently high share of workers would be subject to wage cuts, it could ingenerate a widespread negative economic effect. Therefore, the impact of such policy measures would not only be *micro*- but also *macroeconomic*.

Finally, the present Perspectives article takes the historical surge of remote work due to the COVID-19 pandemic as its starting point to assess the impact that disincentivizing this new approach to work might have on the economy as a whole (i.e., on average wages; the share of labor compensation, consumption, government expenditures and tax revenues; "remote-work intensive" sectors; female participation in the labor market; and income inequality). Therefore, we recurrently adopt a retrospective look (2020-2021), which is functional to better contextualize current and potentially future trends. The value-added of the present Perspectives article remains, nevertheless, unaffected because it contributes substantially and pioneeringly to the exploration of the economic impact of an emerging trend.

2. The economic impact of wage cuts of remote workers

2.1. The impact on average wages

As outlined in the introduction, global companies have recently proposed cutting wages of remote workers by several percentage points (Kurter, 2021; O'Connor, 2021). The underlying reasoning centers on the fact that employees working from home might be able to live in cheaper areas with no need to commute. While this is an unusual reasoning from the perspective of workers' rights – should it matter where remote workers fulfill their tasks or how they spend their income? (Staehelin, 2021) – even employees working from home have to bear equipment costs. This includes, for instance, paying for a high-speed Internet connection, printing/scanning equipment, and a secure connection (Miller, 2020). It is no coincidence that "[i]n a June 2020 report the US Energy Information Administration […] estimated that [residential energy costs] would rise by 20% over the second half of 2020, while industrial use would drop by 12%" (Austin, 2020). Should such a rapid increase have occurred during the energy crisis in 2022, households with remote workers would have been even more affected. Moreover, such a counterintuitive reinterpretation of remote work might negatively affect the economy itself given that, in economic history, nominal and real wages have, on average, continuously grown, not decreased (table 1).

More precisely, in economic history, average wage trends have been influenced by many factors, including technological development, changes in economic policies, trade union

movements, and market fluctuations. Generally, thanks to progressive adjustments in relation to increases in productivity and economic system efficiency, wages tend to rise over the long term; however, periods of stagnating or even declining wages can be observed, especially over short-term intervals, which are not necessarily confined to periods of economic recession or financial crisis (Cencini, 2001). For example, according to the Global Wage Report of the ILO (2023) and data provided by the Organization for Economic Co-operation and Development (2023) on member countries' real annual average wages in the period 1990-2020, it can be seen that in Italy there has been a significant drop in real wages: -2.9% in the last three decades, compared to an average of +18.4% in the OECD countries and of up to +22.6% in the Eurozone. The reasons for this drop are to be found, first, in the Wage Bargaining Model mechanisms. These mechanisms provided for a first level of collective bargaining (Italian acronym: CCNL) and a second level of local agreements – within a specific enterprise or territory – based on the provision of additional wage quotas, depending on results, in an attempt to realign the purchasing power of wages with the degree of productivity achieved (Tronti, 2005). Because of the anomalous trend in Italy with respect to OECD countries, a focused analysis of the phenomenon in Italy is certainly interesting and significant. For instance, among OECD countries, Italy was the first country to face the SARS-CoV-2 pandemic emergency (starting in February 2020), and it implemented protocols and measures to contain the virus's spread and rapidly experimented with widespread home confinement and remote work on a large scale. Other countries subsequently learned from this experience and adopted similar practices.

Table 1 – *Average wages in selected countries (1991-2021), US dollars, 2021*

	1991	2001	2011	2021	Change
			$		%
France	36,828	40,852	46,303	49,313	+33.9
Germany	41,925	47,978	50,076	56,040	+33.7
Italy	40,620	40,862	41,981	40,767	+0.4
OECD	32,280	43,693	46,570	51,607	+65.0
United Kingdom	33,191	42,104	46,073	49,979	+50.6
United States	50,259	57,940	63,349	74,738	+48.7

Source: Organisation for Economic Co-operation and Development (2023).

The opposite scenario represented by shrinking average wages (excluding times of recession; Yokohama, 2014) would be, on average, an anomaly. Generally, decreasing wages could be called "deflationary" first and "recessionary" later, because they first push the price of work down and then create the premises to reduce consumption expenditures and drive the economy into a recession. Clearly, wage cuts would not cause a recession unless the share of employed individuals working remotely would be sufficiently high. For instance, in 2010 in the United States, there were "just" 9.4 million workers (6.6% of the total employed) who worked exclusively at home, while 4.0 million workers (2.8% of the total employed) also worked onsite (Mateyka et al., 2012) (table 2).

Table 2 – *Remote work in non-pandemic times in the United States (1995-2010)*

	Total employed	Onsite workers		Workers at home					
				Total		Mixed workers		Remote workers	
	mil.		%	mil.	%	mil.	%	mil.	%
1995	125.9	115.0	91.4	10.9	8.6	2.5	2.0	8.3	6.6
2010	141.7	128.2	90.5	13.4	9.5	4.0	2.8	9.4	6.6

Source: United States Census Bureau (2012).

Let us assume for the sake of simplicity – as some of the aforementioned global companies did while pointing out that "an employee living […] an hour from New York City by train […] would be paid 15% less if she worked from home, while a colleague from the same office living in New York City would see no cut from working from home" (Kaye, 2021) – that wage cuts affecting remote workers would be equal to 15%. Let us take the average wage to ascertain the economic effect of such a proposed wage reduction. The Organization for Economic Co-operation and Development (2023) defines "average wage" as the result of "dividing the national-accounts-based total wage bill by the average number of employees in the total economy, which is then multiplied by the ratio of the average usual weekly hours per full-time employee to the average usually weekly hours for all employees". Table 3 displays how significantly average wages in selected countries would be affected by a wage cut of remote workers by 15%.

Table 3 – *Impact of wage cuts of remote workers by 15% on average wages in selected European countries (2019-2020)*

	Average wages		Employed persons (15-64 years) working from home to total employment		Average wages after wage cut of 15% for remote workers		Change		Average wage returning to the levels of the year
	2019	2020	2019	2020	2019	2020	2019	2020	
	$		%		$		%		
Austria	57,182	57,272	9.9	18.1	56,333	55,717	-1.5	-2.7	2008
Finland	47,731	47,878	14.1	25.1	46,721	46,075	-2.1	-3.8	2008
France	48,769	46,765	7.0	15.7	48,257	45,664	-1.1	-2.4	2009
Germany	56,427	56,015	5.2	13.6	55,987	54,872	-0.8	-2.0	2018
Ireland	50,448	50,751	7.0	21.5	49,918	49,114	-1.1	-3.2	2008
Italy	41,072	38,686	3.6	12.2	40,850	37,978	-0.5	-1.8	1995
Luxembourg	70,740	70,712	11.6	23.1	69,509	68,262	-1.7	-3.5	2016
Portugal	28,790	29,093	6.5	13.9	28,509	28,486	-1.0	-2.1	1999
Spain	39,346	37,914	4.8	10.9	39,063	37,294	-0.7	-1.6	1991

Source: based on Eurostat (2023a) and Organization for Economic Co-operation and Development (2023).

Let us take the notion of "average wage", decompose it into the respective percentage amount of onsite versus remote workers (table 3) and recalculate it after assuming a wage cut of 15% for all remote workers. Therefore, the average wage in the economy $\frac{W_{TOT}}{E_{TOT}}$, with W_{TOT} corresponding to the total wage bill and E_{TOT} to the average number of employees, would become:

$$\frac{W'_{TOT}}{E'_{TOT}} = \left(\frac{W_{TOT}}{E_{TOT}}(q_1)\right) + \left[\left((0.85)\frac{W_{TOT}}{E_{TOT}}\right)q_2\right] \quad (1)$$

where:

- q_1 is the share of "onsite workers" (100% – q_2);
- q_2 is the share of "remote workers", calculated as the sum of mixed workers and remote workers as reported in table 2;
- $(0.85)\frac{W_{TOT}}{E_{TOT}}$ is the actual average wage after having been reduced by 15% for the corresponding share of remote workers to total employment.

Equation (1) represents, therefore, the general formula quantifying the economic impact on the economy of a wage cut by 15% for remote workers. The decline of $\frac{W_{TOT}}{E_{TOT}}$, which would decrease and turn into $\frac{W'_{TOT}}{E'_{TOT}}$ and downsize the average wage to the levels of several years before (table 3), must be defined as "deflationary". In fact, any contractual reduction of previously higher wages is mostly an anomalous trend in light of the worldwide increase in the standard of living (despite growing inequalities). Even more significantly, the next sections will analyze how such a "deflationary" trend might easily turn into a "recessionary" one.

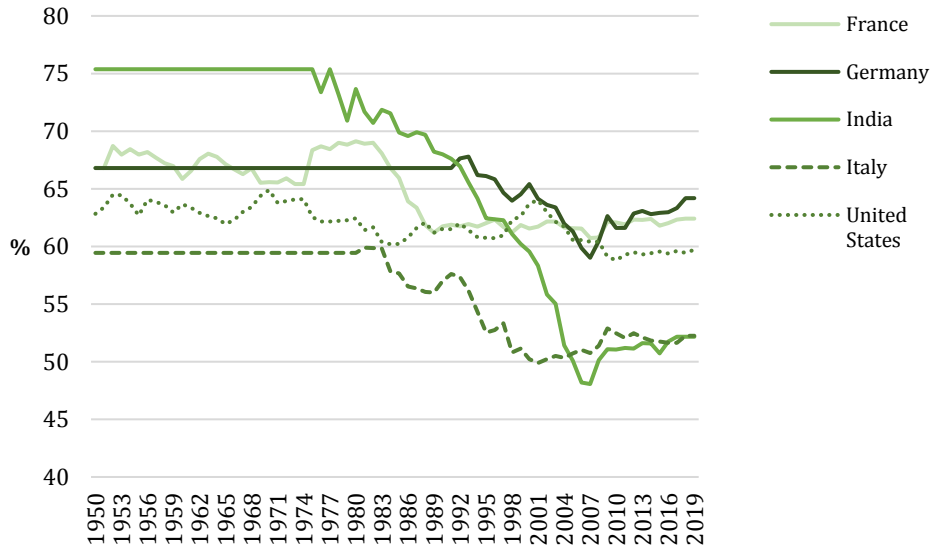
Even if we would not assume considering horizontal wage cuts for remote work and would take into consideration some forms of sectoral or even country-specific heterogeneity with respect to the level of unionization, it would also be correct to consider that the level of unionization and the bargaining power of (remote) workers may increasingly influence wage negotiations and could impact wage determination in the context of remote employment. Especially in such a period of legislative distress concerning remote work, at least as far as aspects of pay equity are concerned, trade unions will be inclined to defend these categories of workers against wage cuts (perceived as arbitrary). Conversely, it would be important to note that remote work may also lead to greater fragmentation and individualization of employment relationships, which could make collective bargaining and union penetration and action far more complex.

2.2. The impact on the share of labor compensation

Another fundamental question arises: since wages represent the main cost factor contributing to final sale prices (Babecký et al., 2009), would the latter decrease too? If not, what would this imply? Cutting wages of remote workers *without* proportionally decreasing final sale prices would boost corporate profits and widen income inequalities. Additionally, the share of labor compensation to GDP (accruing to workers) would shrink to the benefit of the share of corporate profits to GDP (accruing to companies). The trend of lower shares of labor

compensation to GDP[1] (figure 3) would, hence, sharpen too. Although this indicator has to be considered in combination with more specifics like the Gini coefficient and does not necessarily represent the "whole story" when inequality is involved (Farris, 2010), it still emphasizes widening inequalities to the disadvantage of workers. This statistical item differs less strongly among European countries, where the standard of living is more homogeneous; it stands at 62.4% in France and 64.2% in Germany but 52.2% in Italy (Federal Reserve Bank of St. Louis, 2023c, 2021a, 2021d), where low incomes have been an object of concern for decades (Iacono and Ranaldi, 2021).

Figure 3 – *Share of labor compensation in GDP at current national prices in France, Germany, India, Italy and the United States (1950-2019)*



Source: Federal Reserve Bank of St. Louis (2021be, 2021c, 2021d).

If final sale prices were kept stable or were increased after cutting the wages of remote workers, this would be a distorted re-interpretation of remote work, depriving employees of a part of their legitimate compensation, "justified" only by the attempt to keep production costs low and profit margins sufficiently high (Arellano and Higgins, 2008). Income inequality would also disadvantage specific worker categories, such as female employees, who need to combine employment with parenting. As shown by the economic literature (Chung and Van der Lippe, 2020), women often opt for being employed in remote work so as to be economically independent but also sufficiently flexible. "Hybrid" remote work might also propel employment because of lowering the barriers for firms – for instance, adequate premises – to employ more people.

[1] The share of corporate profits to GDP is, in turn, the remaining share to GDP after subtracting the share of labor compensation to GDP.

2.3. The impact on consumption and government expenditures and tax revenues

The fact that $\frac{W_{TOT}}{E_{TOT}}$ would shrink due to wage cuts for remote workers – hence, a reduction of 15% *only* implies lower average wages *in the entire economy* – leads to the conclusion that other economic variables would be affected.

If a sufficiently significant share of employed individuals would earn less than before, it would also have a lower level of net disposable income (Y_d), as shown in equation (2):

$$Y_D = Y_{pr} - T_{dir} \quad (2)$$

where:

- Y_{pr} corresponds to personal income;
- T_{dir} is personal income taxes.

No matter whether we take $\frac{W_{TOT}}{E_{TOT}}$ or Y_D as our statistical item of analysis, the spending capacity of remote workers but also of workers *on average* would turn out to be lower. We can push the argument further: if a sufficiently large share of individuals in a certain country earns less, it will contribute less to consumption expenditures (C), which represents a relevant share of real GDP (Y). Moreover, in any (no matter if progressive or proportional) tax system, a shrinkage of the average wage level would lead to a lower amount of taxes (T) accruing to the government. Paying remote workers less would, *ceteris paribus*, imply paying less taxes and contributing less to tax revenues accruing to the government. This phenomenon is known as "tax buoyancy [which] measures the response of tax revenues to gross domestic product (GDP)" (Hill et al., 2022). Since T contributes to G, and makes government expenditures possible (i.e., excluding financing with own resources and public borrowing), a reduction of G combined with shrinking C would further stimulate the downsizing of Y. Our theoretical analysis confirms, once again, that cutting wages of remote workers would be "recessionary" for the economy.

2.4. The effect on "remote-work intensive" sectors

Employees who work remotely are concentrated heavily in such economic sectors as IT, and financial and education services; these sectors employ large numbers of workers and contribute significantly to the economy as a whole. For example, in 2019, the ICT sector contributed: 3.8% of GDP in the euro area and the EU (Eurostat, 2023c); more than 13% of GDP in India (International Trade Administration, US Department of Commerce, 2022); and 9.6% of GDP in the United States (Bureau of Economic Analysis, 2022).

The following expands on the previous figures. The Indian IT sector provides employment to more than 5 million workers and contributes to almost 8% of the country's GDP (India Brand Equity Foundation, 2023); it was forecast to reach $227bn. in revenue in 2022, according to estimates by the industry body Nasscom (2022). In the European Union, the total value added of the ICT sector stood at around €504bn. in 2019, corresponding to 3.8% of its GDP (Eurostat, 2023d). While the ICT sector has been historically characterized by spillover effects, contributing to GDP growth through other economic sectors (Strobel, 2012), Europe has been dealing for years with the absence of Big Tech and has been facing regulatory problems in attracting them (Ovide, 2021). Remote work, with its multifaceted approaches to business

opportunities, could represent an additional way to extend the impact and duration of the Digital Revolution or Third Industrial Revolution by an equally relevant "corollary". Although this might be perceived as pioneering (and, hence, highly uncertain) work, it could energize Europe's more conservative approach to work and stimulate an even more attractive environment for generations of skilled workers – especially in terms of work-life balance for the Generation Z, for which this aspect is particularly crucial (Ozkan and Solmaz, 2015; Rachmadini and Riyanto, 2020).

Remote work is certainly more common among better-paid occupational groups, whose level of education and training is generally higher and who are most often embedded in conceptual and intellectual work contexts. Yet, it is still important to consider that a work-from-home option is not necessarily limited to these occupational groups. In recent years, as mentioned above concerning measures adopted during the pandemic, remote work that involves different income brackets and employment sectors has become more widespread. Moreover, a certain transversality has been brought about by the need for physical face-to-face interactions in certain jobs or contexts – for example, in manufacturing, healthcare, retail and catering. However, as presented in the literature (*ex multis*, see Sostero et al. for the JRC European Commission group, 2020, and Cetrulo et al., for Italy, 2022), remote work is – on average – more often associated with higher paid occupational groups, which merits greater economic reasoning and discussion.

The Keynesian consumption function expresses the functional relationship between income and consumption expenditure. Moreover, the marginal propensity to consume is given by the ratio between the changes in consumption and the changes in income: $c' = \frac{\Delta C}{\Delta Y}$. This, therefore, represents the slope of the function, ranging between 0 and 1 according to the assumptions above. The marginal propensity to consume, generally, is already decreasing as income increases. In addition, the average propensity to consume, which is also decreasing, is given by the ratio between the level of consumption and income $\left(PMC = \frac{C}{Y} = \frac{C_0}{Y} + c'\right)$. This is because households spend most of their income on necessary goods and services. Higher-income groups also spend proportionately less on other forms of consumption (other than subsistence expenditure) than low- and middle-income households, preferring alternative uses, namely savings (D'Orlando and Sanfilippo, 2010). The reason for this is that the poorer sections of the population have little residual income, low returns on investment, and poorly performing savings availability; thus, in these classes there is a high propensity to consume. In other words, consumption grows less than proportionally to the increase in income and therefore the marginal propensity to consume is always lower than the propensity to consume ($c' < PMC$). Interest rates are not present in the consumption function, which leads us to understand that the fundamental determinant of consumption is income. In addition, in the case of remote workers, there is also a reduction in C_0. Though it is true that consumption for goods and services necessary for subsistence moves downward rigidly, the movement is neither fixed nor constant. Evidently, remote workers have less need for clothing and transport, whilst even meals taken at home show a lower relative outlay. These reductions in costs are greater than the average burden of additional expenses for at-home workplace improvements or technological infrastructure. Furthermore, if remote work is perceived as temporary or the terms of the relationship are not contractually clear in this respect, this may lead to a precautionary higher tendency to save. In the long run, all these points could lead to an increase in socio-economic inequalities.

Some studies, like that of Bonacini et al. (2021), reveal that the increasing feasibility of remote work corresponds to an increase in the average income from work. However, such upward trend is unequally distributed among remote workers. These studies show also a concentration of the benefit of increasing salaries among male employees, older individuals, people with a high level of education and with medium-high wages, even before transitioning to remote work.

Furthermore, Chiou and Tucker (2020) show a strong correlation between high income levels and access to high-speed internet connectivity and powerful computer tools. This observation also demonstrates that the shift to remote work is more compatible with higher-income ranges. With specific regard to Italy, Pigini and Staffolani (2019) examine the wage gap between off-site and on-site workers even before the pandemic. Despite the relatively small percentage of remote workers at the time – approximately 1% of all employed workers – after applying statistical corrections for individual variables and specific job roles, they find an average wage increase for teleworkers that ranges from 2.7% to 8%. The result of these findings – in the absence of structural interventions in human capital and gender-balancing policies (Bertrand, 2018; Goldin, 2014; Weeden, 2005), as well as regulatory definitions – is the persistence (and even increase) of pre-existing inequalities in the labor market. In this sense, it is correct to say that a wage cut of remote workers – assuming the ability to decide arbitrary wage cuts without considering regulations prohibiting differentiations – could stimulate a decrease in terms of (overall) wage inequalities in the labor market. However, such rebalancing would be downward, while the aforementioned structural policies would simultaneously contribute to both levelling wages and increasing their average value. In the medium term, corrective and redistributive policies – in the face of the first emergence of imbalances and wage dispersion – could be activated to facilitate this transition; these could include, for example, labor market policies more focused on new forms of remote relations, collective (re)negotiation, and, more generally, tax policies or horizontal wage cuts, with intra-sectoral solidarity quotas for jobs for which in-person presence is required.

2.5. The effect on female participation in the labor market and income inequality

Let us now focus on selected countries of the Group of Twenty (G20) – some major European ones, but also India and the United States – because they feature common characteristics like a significant contribution of the IT sector to GDP, insufficient female participation in the labor market, and income inequalities.

In addition, the SARS-CoV-2 pandemic experience in these countries has been largely similar. For instance, in responding to this crisis, the central and state governments imposed bans, curfews, and lockdowns internationally, nationally, and locally. The overall (though unavoidable) result of such measures has been the drastic reduction in economic activity (Hale et al., 2020; König and Winkler, 2021). According to the COVID-19 Stringency Index as of the end of December 31, 2022, based on nine response indicators such as school/workplace closures and travel bans, India still stood at 28.7 (where 100 is the strictest level), while other European countries like Germany and Italy ranked, respectively, at 14.8 and 22.0 (Our World in Data, 2022). Although India was badly affected, especially for a short period (Gupta et al., 2021), when the Indian GDP contracted by 6.6% in 2020 as compared to 5.7% in the EU (The World Bank, 2023a), its economic sectors have adjusted quickly, with remote work as the mainstay of their

activities. Conversations about wage cuts, however, can be heard in already "working-poor" countries like India in the context of remote work both overtly and covertly (*The Economic Times*, 2021). While such conversations have been, so far, less prevalent in European countries, there exists a real risk that the increasing willingness of workers to take a wage cut – if it should imply working from home indefinitely – might be implemented in a potentially career-disrupting way (Ceurstemont, 2020). More precisely, remote workers should not be perceived as less meaningful than onsite workers and should have access to equal career opportunities.

In this specific regard, wage cuts in economic sectors using remote work would have a significant impact on female participation. Historically, the labor market participation of females in countries like India has been low – 23% in 2021 (The World Bank, 2023d) – for various reasons (Mehrotra and Parida, 2017). Although data for high-income country groups like the euro area and the European Union show higher percentages – both stand at 51% in 2021 – it is equally true that progress in terms of labor market participation of females has been modest since 1990 and has increased by only +9% and +6%, respectively (The World Bank, 2023b, 2023c). However, both the pandemic and the focus on remote work have increased work flexibility in terms of schedule and location while offering opportunities for females. Moreover, the number of females in sectors with such opportunities has correspondingly increased (Arntz et al., 2020; Credit Suisse, 2021; Madhok, 2021; Tomei, 2021). Clearly, remote work is not "the" solution to all inequalities existing in the labor market, as more critical contributions to the economic literature show (Petropoulos and Schraepen, 2021). While ascertaining whether remote work during the SARS-CoV-2 pandemic has impacted more on male or female workers is not the scope of the present Perspectives article, the proposed wage cuts would bear the potential to (further) disincentivize work, widen the gender gap, and depress labor force participation of women.

Wage cuts also have the potential to further worsen existing inequalities, which have been already sharpened by the COVID pandemic (Deaton, 2021). Depriving labor of its rightful share and, therefore, increasing corporate profits at the expense of the remuneration of the main production input further derails countries' hopes of making sustainable development possible. A similar conclusion applies to particularly inhomogeneous countries ranging from India to the euro area and to the European Union too, where "inequality among EU citizens is significantly lower than among US citizens" (Filauro and Fischer, 2021). We conclude that wage cuts for remote workers would have not only a *microeconomic* effect on the income level of this worker category alone but also a *macroeconomic* effect on the economy in general. Therefore, while the fair remuneration of remote work concerns single individuals, its cumulative economic impact can easily harm an entire society and its wellbeing.

3. Research limitations, future research and conclusion

The present study aims at being a very "pioneering", logical-analytical contribution to the economic literature on a not-yet covered topic like the effect of wage cuts for remote workers. Hence, the adopted approach has been mainly theoretical and has addressed several potential effects on economic variables without adopting a more formalized framework on purpose. Further, empirically more sophisticated studies should follow to deepen the aspects highlighted so far. The main results of the present research can be summed up as follows:

1. While remote work during the SARS-CoV-2 pandemic has prevented the global GDP from crumbling even more, proposals to cut wages of remote workers would turn out to be detrimental. In fact, reducing wages of remote workers *alone* would imply a reduction of the wage level *on average*, which would impoverish the economic society and could with some caveats be called "deflationary" first and "recessionary" later. But there is more: this negative outcome is likely to apply also to GDP, consumption expenditures and tax revenues, which might accordingly shrink. From a regulatory point of view, it should be questioned why the *same* tasks should be remunerated *differently,* depending on the workplace alone.
2. Workplace heterogeneity should be emphasized as an important element to be considered when envisaging the adoption of remote working. Certain occupations can be performed either from home or at the workplace. The choice depends on several elements, including the peculiar nature of the tasks, the availability of appropriate technological tools, and the employer's preferences. As regards the latter, employers can be influenced by several factors, especially by remote employees' perceived productivity (Carbonara et al., 2022). Indeed, some employers may be concerned that remote working could reduce productivity, whilst others may see benefits in terms of increased flexibility, employee satisfaction, and reduced operating costs. In some cases, reduced wages might be one of the employer's considerations when evaluating the adoption of remote working (McCoy Dowdy, 2023);
3. Whenever final sale prices should remain stable, reducing wages of remote workers would sharpen the contraction of the share of labor compensation to GDP and boost the share of corporate profits to GDP;
4. The trend toward inequality would further increase, but labor market participation of females and any employees seeking a better work-life balance would be particularly harmed by wage cuts for remote workers.

Finally, the analysis of the impact on selected countries characterized by the relevance of digital innovation for their respective GDP allows us to claim, even more, that the combination of wealth and work-life balance needed in a world urgently striving for sustainable development and attracting new generations of workers depends on the efficacious implementation of remote work in post-pandemic lives.

Appendix

If we elaborate the data for European Union countries underlying figure 1, we obtain the following results (table A1).

Table A1 – *Calculations based on the share of employed persons (15-64 years) working from home in selected European countries (2010-2020)*

	All countries (2013-2022)	**Pre-COVID-19 (2013-2019)**	**COVID-19 (2019-2020)**	**Post-COVID-19 (2022)**
Mean	7.169%	5.340%	12.391%	9.886%
Median	5.650%	4.600%	10.950%	8.200%
Maximum	32.000%	14.100%	32.000%	25.300%
Minimum	0.200%	0.200%	1.200%	1.400%
Standard deviation	5.657%	3.490%	7.609%	6.328%
Skewness	1.549	0.808	0.642	0.788
Kurtosis	2.735	0.029	-0.359	-0.018

Source: based on Eurostat (2023a).

It can be seen that, while there has been a jump from 2019 to 2020 in terms of employed persons working from home, post-COVID-19 levels are still significantly higher than before the pandemic. Remote work seems, therefore, to be an approach to work destined to remain.

Table A2 – *Sectoral differences in remote work in selected European countries (2019-2020)*

	Finland		France		Germany		Italy		Spain	
	2019	**2020**	**2019**	**2020**	**2019**	**2020**	**2019**	**2020**	**2019**	**2020**
A-B: Agriculture, forestry, fishing, and mining	20.0%	19.0%	13.0%	14.0%	8.0%	13.0%	0.0%	2.0%	0.0%	1.0%
C: Manufacturing	22.0%	32.0%	13.0%	21.0%	8.0%	17.0%	1.0%	8.0%	3.0%	8.0%
D-E: Electricity, gas, and water supply	28.0%	49.0%	16.0%	36.0%	10.0%	24.0%	2.0%	16.0%	4.0%	15.0%
F: Construction	16.0%	20.0%	10.0%	11.0%	4.0%	6.0%	1.0%	3.0%	1.0%	4.0%
G: Wholesale and retail trade; repair of vehicles	26.0%	31.0%	14.0%	19.0%	6.0%	11.0%	1.0%	6.0%	2.0%	5.0%
H: Transport and storage	11.0%	19.0%	11.0%	15.0%	5.0%	11.0%	1.0%	6.0%	1.0%	6.0%
I: Accommodation and food services	15.0%	12.0%	8.0%	7.0%	3.0%	5.0%	1.0%	2.0%	0.0%	2.0%
J: Information and communication	67.0%	81.0%	47.0%	67.0%	33.0%	60.0%	8.0%	48.0%	12.0%	49.0%
K: Financial and insurance activities	54.0%	70.0%	26.0%	52.0%	19.0%	40.0%	3.0%	37.0%	6.0%	28.0%
L: Real estate activities	48.0%	58.0%	19.0%	44.0%	13.0%	28.0%	3.0%	17.0%	2.0%	19.0%
M-N: Professional and support service activities	39.0%	47.0%	27.0%	39.0%	15.0%	26.0%	2.0%	19.0%	3.0%	18.0%
O: Public administration and defence	38.0%	57.0%	15.0%	27.0%	8.0%	22.0%	1.0%	21.0%	2.0%	15.0%
P: Education	54.0%	65.0%	58.0%	60.0%	34.0%	45.0%	5.0%	33.0%	30.0%	41.0%
Q: Human health and social work activities	11.0%	17.0%	16.0%	20.0%	4.0%	6.0%	1.0%	5.0%	1.0%	4.0%
R-T: Other service activities	38.0%	48.0%	21.0%	28.0%	12.0%	21.0%	2.0%	6.0%	3.0%	7.0%

Source: Eurostat (2023b).

Furthermore, it is interesting to look at sectoral differences among countries in terms of adoption of remote work from 2019 to 2020 (table A2). The tertiary sector is, clearly enough, the one presenting more opportunities for off-site workers.

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