# The Impact of the Pandemic and War on Surplus Redistribution Mechanisms: A Sectoral Analysis of France and Italy

Giorgio Garau*, Andrea Karim El Meligi*

*Department of Humanities and Social Sciences, University of Sassari, Via Roma 151, Italy*

**Abstract**

The past three years have witnessed two rare events, the pandemic and the Ukrainian war, which have had significant impacts on the redistribution of surplus. Although both events were exceptional, they affected the surplus redistribution mechanisms differently. The pandemic has raised concerns about globalization processes, leading to a redefinition of global value chains. Conversely, the war has had devastating effects on populations, non-compliance with international laws, and cost inflation, similar to the oil crises of the 1970s. Interestingly, while production systems have scaled back in response to the pandemic, online sales, and the procurement of vaccines and medicines have grown exponentially on a global scale. In contrast, the war has caused certain goods, such as energy, agriculture, and electronics, to become scarce, causing problems in value chains and our daily lives.

This paper aims to investigate the period between 2010 and 2019, corresponding to the interval between the 2008 crisis and the 2019 breakdown, to better understand the relationships between productive sectors and economic agents in France and Italy. Using the Input-Output Tables (IOT) at current and constant prices produced by the respective national statistical systems, we will analyze how the pandemic and the war could affect distributional rules, using Fontela's (1989) and Garau's (1996) methods. Fontela's model establishes the distributional rule of productivity gain in the input-output context, while Garau's proposed model identifies a measure of surplus, called purchasing power transfer (PPT), which accounts for the extra-profit conditions resulting from rental positions held by agents (Market Surplus).

By analyzing the Total Factor Productivity Surplus (TFPS) and Market Surplus measures, policymakers can understand the degree of non-competitiveness in different markets and the impact of the pandemic and the war on sectoral redistribution mechanisms. Limiting market surplus situations and eliminating barriers that protect specific sectors can prevent hindrances to the full revival of the economy. Although the pandemic and the war have global effects, this paper emphasizes the importance of studying redistribution mechanisms at the sectoral level. Understanding sectoral relations can help create a more equitable redistribution of the benefits of economic growth and identify the mechanisms and rules necessary to counteract the observed global issues.

*Keywords:* Input-Output, Total Factor Productivity Surplus, Relative prices.

*JEL Codes*: C67, D24, D57, E31.

*Email: giorgio@uniss.it; Tel: +390792017319.

## 1. Introduction

Between the 2008 crisis and the pandemic, several Western countries (including the USA, Italy, Germany, and some Nordic countries) saw an increase in income concentration. However, there are other Western countries where inequality has decreased or remained relatively stable during the same period (Belgium, France, and Portugal). According to the Oxfam report (2023), "since 2020, the richest 1% have captured nearly two-thirds of all new wealth created in the world; food and energy companies more than doubled their profits in 2022, paying out 257 billion to wealthy shareholders."

Piketty (2014) argues that during the 20th century, there were periods in which mechanisms that favored the reduction of the gap between high and low incomes prevailed, compared to periods in which divergent forces were manifested. In the former case, the only certain factor that favors the convergence process is investments in skills and the consequent dissemination of knowledge, as they lead to an increase in productivity and a reduction in inequalities both within and between countries. Conversely, shortcomings in the education system, such as those experienced during the pandemic, can widen the gaps. The main factor of divergence, during periods of slowed growth, is the accumulation and concentration of assets, especially when the rate of return on capital exceeds the rate of economic growth.

Stiglitz (2016) shows that excessive inequality can depress economic growth. In particular, he emphasizes the relationship between inequality of outcomes and disparities in opportunities, and then finds the roots of this disparity in the exercise of monopoly power and the resulting rent. Among the actions that can be taken to reverse inequality are economic policies that seek to boost demand (public investment in infrastructure and technology), investments that ensure everyone receives a good education to prevent inequalities from being passed down from generation to generation, and tax systems that finance these investments through a taxation of capital income, thereby reducing the net return on capital.

The concentration of income or wealth can be measured in different ways, through the Gini index that measures the distance from a hypothetical situation of income equality, or by comparing the income held by the top quintile (the 20% of the population with the highest income) with that held by the bottom quintile (the 20% of the population with the lowest income). It is important to emphasize that income concentration is a complex phenomenon that depends not only on the structure of the economy but also on fiscal policy and the welfare system, as well as the ability of education systems to reduce or widen the gaps between social classes and to impact labor market dynamics and ultimately poverty.

The ability of an economic system to grow, i.e., to generate an increase in Total Factor Productivity, (TFP), indicates the efficiency with which an economy utilizes its productive factors, such as labor and capital, to produce goods and services. When measures of income and wealth concentration are compared with those of economic growth and underlying productivity, it is observed that in some situations, TFP growth is accompanied by an increase in income inequality. However, this essentially macroeconomic reasoning does not take into account the true drivers of growth (determined by sectoral innovations) and how, through which mechanisms, the benefits of growth are transferred between sectors and institutional actors. Analysis of the internal rules of the economic system (which vary across economic systems) allows for pinpointing who benefits from growth and lends itself to the adoption of sectoral corrective measures to make the channels of transmission of benefits between sectors and agents more fluid.

In this paper, we aim to understand how the exceptional events of the last three years may have redefined the rules for the distribution of the benefits of economic growth, and then consider the mechanisms that regulate the appropriation of growth benefits and their distribution among the different actors in the system. We will start with some macroeconomic evidence and then move on to the mechanisms of resource transfer between productive sectors and institutional actors, as a result of changes in relative prices.

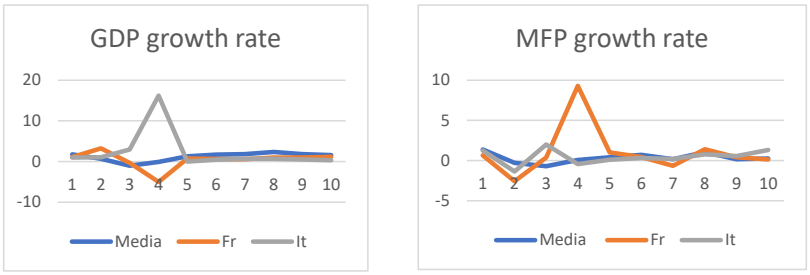
There can be several reasons why the benefits of sectoral TFP growth do not transfer to other actors. For example, if some companies have market power, this allows them to exploit TFP growth to increase their own profits, without transferring the benefits to other companies or consumers. There are also situations where episodes of TFP growth are limited to certain regions or sectors of the economy and, in such cases, despite spillover effects, not everyone benefits equally from the growth. Finally, there is the case of inadequate public policies (as mentioned above, from fiscal policies to those defining the welfare and education systems) in ensuring an equitable redistribution of the benefits of growth. In the latter case, it is unfortunately evident that this incapacity can be strongly correlated with the absence of adequate measures of these phenomena.

In the second paragraph, we will see how Western economies, and in particular Italy and France, are characterized between 2009 and 2019 in terms of their ability to generate TFP and the parallel evolution of income concentration levels. Subsequently, in the third paragraph, we will examine the rules that characterize the distribution of the benefits of growth in the two countries studied, using the methodologies developed by Fontela (1989). In the fourth paragraph we propose a method for calculating implicit prices indexes using input-output tables and in the following paragraph we introduce some results together with Garau (1996) methodology to analyse purchasing power transfer (PPT). In the sixth paragraph, we will present a comparison among Italy and France and we try to understand, in the sense of predicting, how the events of the last three years may have modified the rules for distributing TFP. Finally in paragraph seven some conclusions are drawn.

## 2. Productivity growth and increasing inequalities

The period we are considering is from 2010 to 2019. In 2010, after the crises of 2007 (subprime) and 2008 (Lehman Brothers), productivity and GDP values stabilize, although in 2011 there is another shock related to the sovereign debt crisis. The dataset considered concerns 14 European countries (including Switzerland). In the first graph, compared to the average growth rate of 14 countries, which was -0.11% between 2012 and 2013, France grew by 0.57% while Italy decreased by 1.86%, and this determines the shape of the first figure. In the same period, however, compared to an average growth of 0.06, multifactor productivity grew by 0.6% in France while it decreased by 0.028 in Italy.

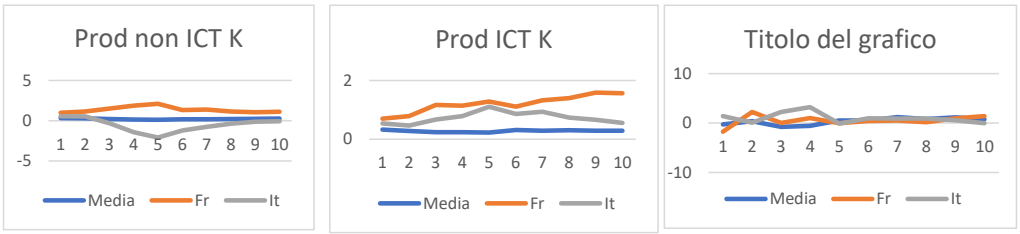
Figure 1: GDP and MFP growth rate




Source: Own elaboration

If we consider the components of capital and labor, we have the following graphs. The graphs show a strong gap in capital productivity in non-ICT industries, which increased by 2.1% in France in 2014 and decreased by 2.09% in Italy. In the second graph, it can be seen that the distance between the two countries in terms of capital productivity decreases until 2014 and then resumes on diverging paths. Finally, the graph on labor productivity shows how, after the first four years of the series with alternating trends for the two countries, from 2014 the countries move in sync. In summary, on the eve of the pandemic, the two countries fundamentally differ in terms of capital productivity in ICT branches and MFP.

Figure 2: Prod K and Prod L, growth rate




Source: Own elaboration

Regarding the trend of inequality, measured by the ratio between the income of the richest quintile compared to that of the poorest quintile, compared to the average trend of the 14 countries considered, France consistently remains below the average and closes 2019 with a value equal to 94% of the average. On the other hand, Italy progressively worsens its situation, and in 2019, the index is higher than the average value by 32%.

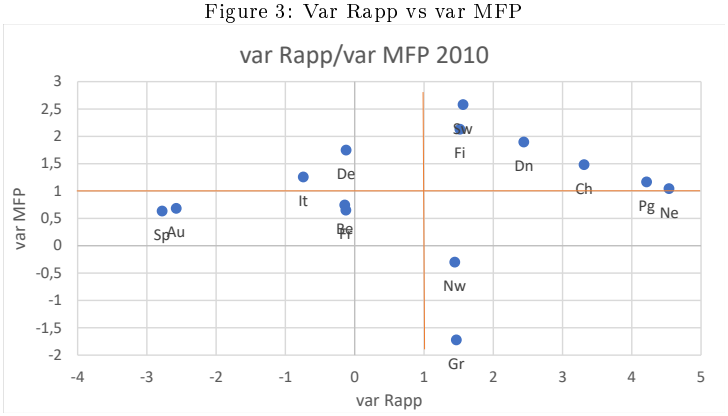
Table 1: 8020 ratio, relative values

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| Average | 4.52 | 4.56 | 4.60 | 4.60 | 4.73 | 4.69 | 4.72 | 4.69 | 4.58 | 4.56 |
| Fr | 0.98 | 1.01 | 0.99 | 0.97 | 0.90 | 0.91 | 0. 92 | 0.92 | 0.92 | 0.94 |
| It | 1.19 | 1.26 | 1.23 | 1.27 | 1.22 | 1.24 | 1.33 | 1.26 | 1.33 | 1.32 |

Source: Own elaboration

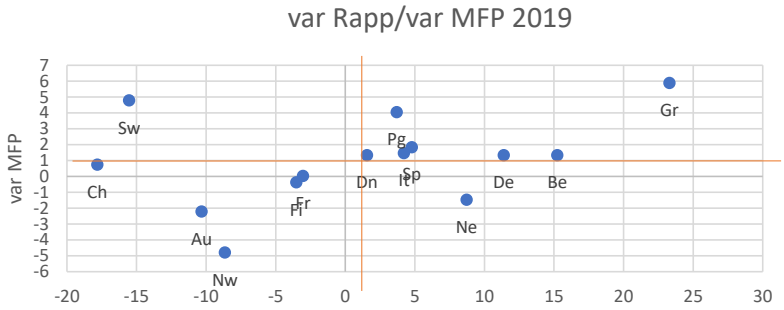
Finally, as a complement to what has been said so far, let us consider the information provided by the OECD on the concentration of wealth, which, as we have mentioned in the introduction, could be more informative than income concentration levels in periods of weak growth. The differences between Italy and France are quite significant, around 5 percentage points, which become 7.5 in 2014. In order to summarize these first macroeconomic evidences, we have put together indicators of economic performance and inequality in a scatter plot. We calculated the following two indexes: "var Rapp", which represents the variation of the ratio between the first and the fifth quintile, and "var MFP", which indicates the variation of MFP (Multi Factor Productivity) between 2009 and 2010. These indexes were then transformed into relative terms, by recalculating them with respect to the average values of the 14 countries. The two graphs below represent the first one, the values of the two indicators in the period 2009-2010, and the second in the period 2018-2019.

Figure 3: Var Rapp vs var MFP




Source: Own elaboration

Figure 4: Var Rapp vs var MFP




Source: Own elaboration

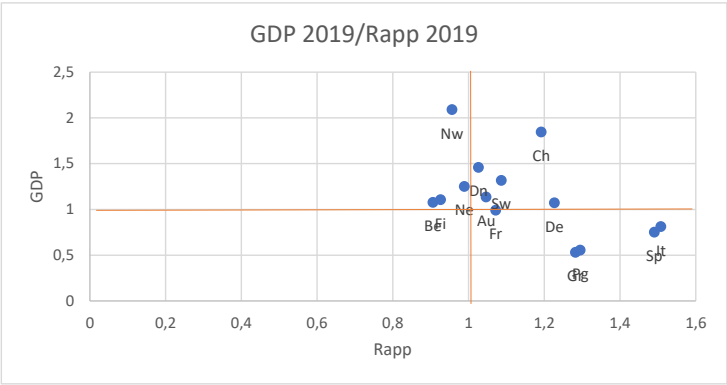
Compared to the average values of the 14 countries for the two indicators considered, we can identify four quadrants that can be interpreted as follows. In the period 2009-2010, income concentration decreased on average (by -0.02%) and MFP increased on average by 1.38%. Compared to these average values, in

the first quadrant we find countries where the variation of Rapp decreases more than the average, and the variation of MFP is greater than the average. These are the virtuous countries, where the increase in MFP is accompanied by a reduction in inequality. Among them are some northern European countries (Sweden, Denmark, and Finland), as well as Switzerland and Portugal. In the second quadrant, there are countries where, despite an increase in MFP, there is an increase in inequality (or rather, a reduction in the ratio between the two quintiles that is lower than the average). For example, in Italy and Germany, inequality remains stable, and the increase in MFP does not affect income concentration. In the third quadrant, we have countries where there is a worsening of the quintile ratio (or even a reduction below the average), but also a variation of MFP below the average. Among these countries, we find Belgium, France, Spain, and Austria. In the fourth quadrant, we finally find countries like Norway and Greece where, despite MFP increasing less than the average, inequality has decreased more than the average.

In the period 2018-2019, the ratio between quintiles remains stable on average (-0.003) and the variation in MFP is on average 0.27, a value significantly lower than that recorded between 2009 and 2010. The noteworthy changes compared to the previous period are those of Sweden, which despite a sustained increase in MFP shows an increase in inequality, Greece, which moves from the fourth to the first quadrant, and Norway, which together with Switzerland experiences a strong increase in inequality as in Sweden. Italy moves from the second to the fourth quadrant and France maintains its position almost unchanged.

Finally, let us consider the following scatterplot, where we represent the GDP (per capita at constant prices) and the inequality indicator as of 2019. Italy is characterized by inequality levels greater than 51% (it was greater than 32% in 2009)compared to the average value and GDP levels equal to 81% (it was equal to 86% in 2009) of the average value. On the other hand, France is very close to the origin of the axes (as in 2009) that represent the average value of the two indicators. In other words, on the eve of the pandemic, Italy's situation was certainly more critical than that of France.

Figure 5: Rapp vs constant GDP 2019




Source: Own elaboration

## 3. The distribution of TFPS

Fontela (1989) starts from the generalised Kendrick TFP index and developed an alternative measure of TFP surplus.

$$KTFP_{i,t} = \frac{\sum_j p_{i,j,0} q_{i,j,t}}{\sum_j p_{j,i,0} q_{j,i,t}} \tag{1}$$

His measures is based on the difference between outputs and inputs both measured at constant prices, as follows:

$$TFPS_{i,t} = \sum_j p_{i,j,0} \cdot q_{i,j,t} - \sum_j p_{j,i,0} \cdot q_{j,i,t} \tag{2}$$

where $TFPS_{i,t}$ corresponds to the amount of real resource flows between time $t$ and time 0, $q_{i,j,t}$ is the flow of output of sector $i$ towards sector $j$ and $p_{i,j,0}$ is the market price in its base year value. Since $\sum_j p_{i,j,t} \cdot q_{i,j,t} = \sum_j p_{j,i,t} \cdot q_{j,i,t}$, the expression (2) can be rewritten in terms of price variations as follows (Fontela, 1989):

$$TFPS_{i,t} = -\sum_j q_{i,j,t} \cdot (p_{i,j,t} - p_{i,j,0}) + \sum_j q_{j,i,t} \cdot (p_{j,i,t} - p_{j,i,0}) \tag{3}$$

Equation (2) measures the creation of the TFPS using the index number approach, while Equation (3) can be interpreted as the distributional rule of the TFPS. As is self-evident, such a distribution depends on the price variations of outputs (first element on the right-hand side) and inputs (second element on the right-hand side). The relations between the two TFP measures is as follows:

$$TFPS_{i,t} = (KTFP_{i,t} - 1)(\sum_j p_{i,j,0} q_{i,j,t}) \tag{4}$$

In other words, aside from a scaling factor, $TFPS$ is equal to the rate of change of $KTFP$. Let us now assume that, for a given period $t$: $\mathbf{X}$ and $\overline{\mathbf{X}}$, $\mathbf{l}$ and $\bar{\mathbf{l}}$, $\mathbf{k}$ and $\bar{\mathbf{k}}$, $\mathbf{m}$ and $\overline{\mathbf{m}}$, $\mathbf{f}$ and $\bar{\mathbf{f}}$, $\mathbf{e}$ and $\bar{\mathbf{e}}$ are the matrix of intermediate flows, a vector of labor income, capital return, import flows, final demand, and export demand, respectively in current and constant prices. According to the accounting constraint, the following equations hold:

$$\mathbf{X}'\iota + \mathbf{l} + \mathbf{k} + \mathbf{m} = \mathbf{X}\iota + \mathbf{f} + \mathbf{e} \tag{5}$$

$$\overline{\mathbf{X}}'\iota + \bar{\mathbf{l}} + \bar{\mathbf{k}} + \overline{\mathbf{m}} = \overline{\mathbf{X}}\iota + \bar{\mathbf{f}} + \bar{\mathbf{e}} \tag{6}$$

where $\iota$ is a unit vector. As we cannot observe $\bar{\mathbf{k}}$, the value added $(\bar{\mathbf{l}} + \bar{\mathbf{k}})$ must, of course, be obtained as a residual. However, if we are able to deflate every single item in Equation (5), including $\mathbf{k}$, or at least identify a proper deflator for the overall value added, it is quite plausible that the equilibrating relationship represented in Equation (6) does not hold.

As pointed out by Flexner (1959), although we were able to remove all statistical discrepancies due to calculation and statistical approximations, Equation (6) would be inadequate to represent a constant

price relationship whenever productivity changes arise between base year and current values; this must be reflected by a balancing item in Equation (6).

Accordingly, we may argue that a well-defined system of accounts may provide a measure of productivity resulting from the difference between the amount of goods produced and the amount of production inputs used. Such a measure will take a positive value only if the quantity variation of the output is greater than the variation of all inputs. Therefore, the relationship in Equation (6) does not hold, and the balancing term has a precise economic meaning, which is called TFPS by Fontela (1989):

$$\left[\overline{\mathbf{X}}'\iota + \bar{\mathbf{l}} + \bar{\mathbf{k}} + \overline{\mathbf{m}}\right] + \mathbf{TFPS} = \overline{\mathbf{X}}\iota + \bar{\mathbf{f}} + \bar{\mathbf{e}} \tag{7}$$

For a given period, t, the following definition of TFPS hold:

$$\mathbf{TFPS} = (\mathbf{S}'\iota + \mathbf{s_k} + \mathbf{s_l} + \mathbf{s_m}) - (\mathbf{S}\iota + \mathbf{s_f} + \mathbf{s_e}) \tag{8}$$

where $\mathbf{S}\left[s_{i,j}\right] = \mathbf{X} - \overline{\mathbf{X}}$, $\mathbf{s_k}\left[sk_i\right] = \mathbf{k} - \bar{\mathbf{k}}$, $\mathbf{s_l}\left[sl_i\right] = \mathbf{l} - \bar{\mathbf{l}}$, $\mathbf{s_m}\left[sm_i\right] = \mathbf{m} - \overline{\mathbf{m}}$, $\mathbf{s_f}\left[sf_i\right] = \mathbf{f} - \bar{\mathbf{f}}$ and $\mathbf{s_e}\left[se_i\right] = \mathbf{e} - \bar{\mathbf{e}}$.

By considering a given year $t$:

1. $s_{i,j} > 0$, it means that industry $j$ is transferring surplus to industry $i$, and the reverse applies when $s_{i,j} < 0$, that is, industry $j$ is paying relatively less for the inputs provided by industry $i$. Particularly interesting is the net industry contribution of industry $i$: $s_{n,i} = \sum_j s_{j,i} - \sum_j s_{i,j}$. When $s_{n,i} > 0$, industry $i$ transfers its surplus to the rest of the economy more than it is gaining from all the other sectors.
2. Industry $i$ is transferring surplus to its primary inputs when $sl_i$ and $sk_i$ are positive.
3. When the price of some commodity falls, industries transfer additional surplus to consumers making $sf_i < 0$.
4. From the trade side, we have an inflow of productivity gains from the rest of the world $se_i > 0$ and $sm_i < 0$. The reverse applies when $se_i < 0$ and $sm_i > 0$. Then, we can compute, as in Fontela *et al.* (2003), net outflow $sm_i - se_i > 0$ or the net inflow in the opposite situation, $sm_i - se_i < 0$.

Even if the double deflation method is widely used, it can hide some important processes behind economic growth, such as technical progress. An equilibrating system of accounts cannot be used at constant prices without the loss of some important effects concerning economic growth such as efficiency, rent spillovers, and all those elements that may concern disembodied technical change. Instead, a single deflation procedure would allow one to determine a measure of productivity gains (Flexner, 1959; Fontela, 1989; Babeau, 1978; Garau, 1996) and understand the process of generating economic growth.

Moreover, the use of a constant price method not only gives us the opportunity to obtain information on the internal productivity generation process, but also identifies the external determinants of growth that are behind the change in the terms of trade if proper price indexes are used to deflate imports and exports. This would yield interesting results, since the literature on economic growth has now recognized the role of knowledge spillovers as the most important driving force behind economic growth. As knowledge is incorporated into commodities, trade with highly technological countries means high quality and sophisticated inputs (either intermediate or capital goods) that improve efficiency and, in turn, competition among regions. Such

a potential finding has been identified by Flexner (1959), while estimates of external rent spillovers for the Swiss economy may be found in Antille and Fontela (2003).

## 4. Implicit price indexes and IOT deflation

We now consider the construction of sector price indexes to deflate the 2019 Italian and French input–output tables[1]. In particular, we use symmetrical input–output tables at current prices and at previous year prices, derived from the supply and use tables released by Istat. If we compare the values of the two tables, we obtain:

$$\frac{p_t \cdot q_t}{p_{t-1} \cdot q_t} = \frac{p_t}{p_{t-1}} = I_{i;t,t-1} \tag{9}$$

which represents the implicit price index between time $t$ and time *t-1*. Proceeding backward, we have:

$$\frac{p_{t-1} \cdot q_{t-1}}{p_{t-2} \cdot q_{t-1}} = \frac{p_{t-1}}{p_{t-2}}$$

Taking the reciprocal of the latter we obtain:

$$\frac{1}{\frac{p_{t-1}}{p_{t-2}}} \tag{10}$$

Comparing expressions (9) and (10) we obtain:

$$\frac{\frac{p_t}{p_{t-1}}}{\frac{1}{\frac{p_{t-1}}{p_{t-2}}}} = \frac{p_t}{p_{t-1}} \cdot \frac{p_{t-1}}{p_{t-2}} = \frac{p_t}{p_{t-2}} = I_{i;t,t-2} \tag{11}$$

We can generalize the above to obtain implicit price index I related to period *t, t-n* for the generic i sector of the input–output table:

$$\frac{p_t}{p_{t-1}} \cdot \frac{p_{t-1}}{p_{t-2}} \cdot \ldots \cdot \frac{p_{t-n+1}}{p_{t-n}} = \frac{p_t}{p_{t-n}} = I_{i;t,t-n} \tag{12}$$

It should be emphasized that these price indexes are not “pure"; in fact, we have to consider that Istat makes adjustments for the tables at previous year prices for balancing, which also modifies quantities in addition to prices. However, these adjustments are negligible for quantities, that is, they will not change quantities substantially since, if this were to happen, the input–output table at the previous year prices would not reflect production for year $t$ and the tables would thus not be comparable. As such, the quantity adjustment is remarkably small and, as a result, it is considered negligible. Through the procedure described above, we obtain implicit price indexes for all matrices and vectors of the input–output system, which are then used to deflate the input–output table and, subsequently, compute the TFPS using Equation (8).

[1] SUT tables (2018), availables from: `https://ec.europa.eu/eurostat/data/database`

## 5. Some results

### *5.1. The Fontela surplus*

By utilizing Equation 8, we have calculated the Fontela TFPS, which we refer to as Purchasing Power Transfers (PPT), and the outcomes are shown in both Figure 6 and Figure 7. In the Italian economy (Figure 6), for the period analyzed (2011-2019), there appears to be a deficiency in the system's ability to generate a favorable PPT. Moreover, there seems to be a shift of resources from consumption, investments, and exports towards primary factors. The table features a chosen set of sectors, starting with the top three contributors to PPT creation, followed by those that function as the main PPT absorbers. Additionally, the table comprises five sectors positively influenced by the pandemic and war and five sectors negatively affected by these events. The first category includes energy production (3293 mil), air transport (1668), and water management (725). Concerning energy production, PPT (accounting for 16% of the available surplus) has increased due to the rise in consumption and intermediate output prices, thus benefiting primary and intermediate inputs. Conversely, for air transport, PPT constitutes 61% of the available surplus. As a result, through a decrease in prices for intermediate sectors (-273), this resource set advantages primary factors by 58% and the remaining amount to intermediate sectors. In the second category, we find Metallurgy (-1406) followed by Telecommunications (-1270) and Insurance (-830). For the first case, the negative value of the available surplus (-9787) stems from an absorption of resources from intermediate inputs, primary inputs, and imports, ultimately leading to an outflow of resources through foreign trade and a negative PPT. For Telecommunications, a transfer of purchasing power from primary factors (contributing to 78% of the available surplus) to consumers (30%) and intermediate sectors (53%) is evident. Finally, in the Insurance sector, while the available surplus is positive, the transfer of resources from final demand components to those of the cost structure results in a negative imbalance.

Figure 6: PPT Distribution in Italy, 2011 – 2019; values in millions of Euros

| | | create PPT | | | absorb PPT | | | positively influenced | | | | negatively influenced | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Electricity, gas, steam | Sewerage and waste | Air transport | Man. basic metals | Telecommunications | Insur. and pension exc. soc sec. | Man. basic pharmaceutical | Man. computer, electron. | Financial service | Human health activities | Construction | Land transport and pipelines | Accommodation and food | Real estate | Travel agency, tour operator | **Total Economy** |
| Italy | PPT | 3293 | 725 | 1668 | -1406 | -1270 | -830 | 110 | -180 | 841 | -701 | 710 | -739 | -461 | -145 | 48 | -2657 |
| lowering (-) increasing (+) the cost of intermediate and primary inputs | Col sum | 16318 | 2585 | 378 | -1320 | -1573 | 2104 | 368 | 47 | 1854 | 145 | 6047 | 3709 | 4166 | 1658 | 1202 | 71936 |
| | Added Valu | 6406 | 3180 | 1576 | -1932 | -8966 | 4517 | -88 | 788 | -5969 | 6101 | 3760 | 7101 | 5286 | 5497 | 796 | 113671 |
| | Tax | -1457 | 125 | 27 | -1702 | -266 | -16 | -39 | -33 | -667 | 619 | -15 | 1097 | 442 | -73 | 65 | 1546 |
| Import | Import | -184 | -506 | 749 | -4833 | -971 | 304 | -1357 | -1122 | 627 | 29 | 178 | 460 | 687 | 86 | 113 | -14692 |
| | Available surplus | 21082 | 5384 | 2731 | -9787 | -11777 | 6910 | -1116 | -319 | -4155 | 6894 | 9970 | 12366 | 10580 | 7168 | 2176 | 172461 |
| Distribution process | | | | | | | | | | | | | | | | | |
| lowering (-) increasing (+) the price for intermediate and final outputs | Row sum | 14654 | 3562 | -273 | -6806 | -6203 | 4273 | -161 | 365 | 206 | 1361 | 3784 | 8540 | 2912 | 4552 | 1219 | 71936 |
| | ConsH | 2884 | 1091 | 1195 | -32 | -3445 | 3133 | 56 | -1514 | -5551 | 2155 | 852 | 4202 | 7941 | 1672 | 758 | 41735 |
| | ConsG | 27 | 23 | -4 | 9 | -3 | 0 | -623 | -3 | 5 | 4002 | -138 | -24 | -14 | 19 | -9 | 18738 |
| | ConsNP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 153 | 0 | 0 | 916 |
| | I | 262 | 27 | 10 | 3 | -70 | -11 | 73 | 227 | -36 | 21 | 4606 | 285 | 20 | 883 | 0 | 16917 |
| | Valuable | 0 | 0 | -18 | 2 | 0 | 0 | 1 | 4 | 0 | 3 | 2 | 9 | 1 | 0 | 0 | 454 |
| | Delta Stock | -45 | -4 | 0 | 23 | 49 | 0 | 9 | 17 | 0 | 2 | -19 | 1 | -1 | 0 | -1 | 1915 |
| pos/neg spillover to Export | Export | 7 | -41 | 153 | -1581 | -835 | 344 | -581 | 765 | 380 | 39 | 173 | 92 | 29 | 187 | 161 | 22508 |
| Net intermediate position | Colum sum -Row sum | 1664 | -977 | 651 | 5486 | 4630 | -2169 | 529 | -317 | 1648 | -1216 | 2264 | -4831 | 1254 | -2894 | -17 | 0 |
| Net outflow(-)/inflow(+) | Import-export | -191 | -465 | 596 | -3253 | -136 | -40 | -775 | -1887 | 247 | -10 | 5 | 368 | 659 | -101 | -48 | -37200 |

Source: Own elaboration

In Figure 7 for France, it appears that there is a capacity to generate PPT of 9847, but this is not entirely accurate as the value of stocks (-20704) must be removed. This value results from a 2017 deflator and when set to zero, the overall PPT becomes negative (-10857) similar to Italy. France also experiences a transfer of resources from consumption, investments, and exports to primary factors. The Chemical sector contributes the most to PPT, however, when the effect of stock variation is eliminated, the value becomes a more reasonable 808. The Motor vehicle manufacturing sector follows, generating a PPT of 1474 and allowing for a transfer to intermediate sectors of 5791 with the net inflow from international trade and the absorption of resources from consumption and investments. The Water transport sector also creates a PPT of 1783 by absorbing resources from primary inputs and transferring them to intermediate sectors and abroad. The Crop and animal sector absorbs the most PPT by taking from consumption and intermediate sectors and transferring to primary inputs and abroad. The Warehousing sector absorbs a significant amount of resources from intermediate sectors (10295) to transfer them mostly to value-added components. It is difficult to compare Italy and France at this level as the sectors considered in presenting the results are different in the two countries. In the next paragraph, we will expand the set of sectors considered to include common sectors that are positively and negatively influenced by the exceptional events of the last three years.

Figure 7: PPT Distribution in France, 2011 – 2019; values in millions of Euros

| | | create PPT | | | absorb PPT | | | positively influenced | | | | | negatively influenced | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Man. chemicals and chemical products | Man. motor veh. | Water transport | Crop and animal | Wholesale retail repair | Warehousing supp activ. | Man.basic pharma. | Man. Computer | Electricity, gas, steam | Financial service | Human health activities | Construction | Land transport pipelines | Accommodation and food | Real estate | Travel agency, tour operator | **Total economy** |
| France | PPT | 21512 | 1474 | 1783 | -5330 | -1064 | -2686 | -295 | 115 | -114 | -604 | -114 | -84 | -251 | -78 | 250 | -45 | 9847 |
| lowering (-) increasing (+) the cost of intermediate and primary inputs | Col sum | -2118 | 1641 | 793 | 505 | -1437 | -185 | -1081 | -561 | 2436 | 4938 | 602 | 9386 | 1982 | 5910 | -1293 | 437 | 48140 |
| | Added Valu | -816 | 2595 | -2947 | 3046 | 6234 | 7743 | -2882 | -2654 | 9366 | -9241 | 3635 | 15970 | 5677 | 9119 | 8728 | 629 | 120400 |
| | Tax | 218 | 37 | 202 | 440 | 23 | 199 | -27 | 12 | 599 | -321 | 4 | 383 | 576 | 183 | -36 | 23 | 7499 |
| pos/neg spillover from Import | Import | -2469 | -374 | -256 | 1020 | 0 | 1578 | -3426 | -12054 | -103 | 163 | 10 | 0 | 1313 | 0 | 0 | 0 | -16113 |
| | Available surplus | -5185 | 3899 | -2208 | 5012 | 4820 | 9335 | -7416 | -15257 | 12299 | -4462 | 4251 | 25739 | 9548 | 15211 | 7399 | 1089 | 159926 |
| Distribution process | Row sum | -3749 | -4150 | -1959 | 2631 | 392 | 10110 | -276 | -4411 | 5638 | -704 | 294 | 6405 | 5693 | 4050 | 2924 | 691 | 48140 |
| lowering (-) increasing (+) the price for intermediate and final outputs | ConsH | 231 | 1150 | -15 | 5010 | 4785 | 1022 | -1416 | -7056 | 7656 | -4426 | 1308 | 2632 | 2305 | 11139 | 3161 | 444 | 45924 |
| | ConsG | -13 | 0 | 0 | 2 | 0 | 0 | -3288 | -10 | 0 | 0 | 2659 | 0 | 291 | 100 | 738 | 0 | 19331 |
| | ConsNP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 | 0 | 0 | 0 | 0 | 0 | 4310 |
| | I | 0 | 1418 | 0 | 88 | 513 | 11 | 0 | -2094 | 0 | 0 | 4 | 16699 | 81 | 0 | 327 | 0 | 30601 |
| | Valuable | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 |
| | Delta Stock | -20704 | 241 | 0 | 2722 | 0 | 0 | 549 | -394 | 0 | 0 | 0 | 87 | 0 | 0 | 0 | 0 | -16986 |
| pos/neg spillover to Export | Export | -2461 | 3766 | -2017 | -111 | 194 | 878 | -2690 | -1408 | -881 | 1273 | 19 | 0 | 1430 | 0 | 0 | 0 | 18721 |
| Net intermediate position | Colum sum - Row sum | 1632 | 5791 | 2752 | -2125 | -1829 | -10295 | -805 | 3850 | -3202 | 5642 | 307 | 2981 | -3710 | 1859 | -4216 | -254 | 0 |
| Net outflow(-)/inflow(+) | Import-export | -8 | -4140 | 1760 | 1131 | -194 | 700 | -736 | -10646 | 778 | -1110 | -9 | 0 | -117 | 0 | 0 | 0 | -34835 |

Source: Own elaboration

### *5.2. Optimal TFPS and market surplus (the Garau surplus)*

Fontela's (1989) model fails to emphasize the impact of agent and market behavior on the variation of TFPS in the economic system. It does not consider the pricing flexibility of certain agents, which is not reflected in the calculation of $TFPS_{ij}$. To address this limitation, Garau (1996) proposes a model that decomposes $TFPS_{ij}$ and takes into account the two components of price.

$$p_{ij0} = p^{*}_{ij0} + p^{**}_{ij0} \tag{13}$$

$p^{*}_{ij0}$ refers to the hypothetical market price that would prevail under a competitive scenario where agents are unable to earn any extra profits. On the other hand, $p^{**}_{ij0}$ is a measure of market distortion that captures the extent to which economic agents can benefit from market imperfections and earn a surplus.

Based on the above, it is possible to break down $TFPS_{ij}$ in the following manner:

$$TFPS_{ij} = -\sum_{j} q_{ijt} * (p_{ijt} - p^{*}_{ij0} - p^{**}_{ij0}) + \sum_{j} q_{jit} * (p_{jit} - p^{*}_{ji0} - p^{**}_{ji0}) \tag{14}$$

$$TFPS_{ij} = -\sum_{j} q_{ijt} * (p_{ijt} - p^{*}_{ij0}) + \sum_{j} q_{ijt} * p^{**}_{ij0} + \sum_{j} q_{jit} * (p_{jit} - p^{*}_{ji0}) - \sum_{j} q_{jit} * p^{**}_{ji0} \tag{15}$$

Optimal $TFPS_{ij}$ is defined as

$$TFPS^{*}_{ij} = -\sum_{j} q_{ijt} * (p_{ijt} - p^{*}_{ij0}) + \sum_{j} q_{jit} * (p_{jit} - p^{*}_{ji0}) \tag{16}$$

while $MS_{ij}$ is defined as

$$MS_{ij} = \sum_{j} q_{ijt} * p^{**}_{ij0} - \sum_{j} q_{jit} * p^{**}_{ji0} \tag{17}$$

Then the $PPT_{ij}$ is given by

$$PPT_{ij} = TFPS_{ij} = TFPS^{*}_{ij} + MS_{ij} \tag{18}$$

After analyzing the difference between the terms in the last equation, we can make the following observations:

$TFPS^{*}_{ij}$ will have a positive value if the second term exceeds the first term. This implies that the $i$ sector is able to generate and distribute purchasing power resulting from an increase in productivity.

Conversely, $MS_{ij}$ will have a negative value if the second term is greater than the first. This indicates that a negative value signifies a redistribution of purchasing power. To estimate $TFPS_{ij}$, we can use the Törnqvist price index (Wolff 1989; Fontela, 1994) as a substitute for $p_{ij}$. The Törnqvist price index can be computed using the following formula:

$$T_{i,t-n,t} = \prod_{i} \left( \frac{p_{i,t}}{p_{i,t-n}} \right)^{\frac{w_{i,t-n} + w_{i,t}}{2}} \tag{19}$$

It is evident that this index is universal for an entire row in the input-output table, meaning that we assume the price charged by sector $i$ for its intermediate products used across all purchasing sectors $j$ remains constant. The relationship between prices for each sector is established by comparing the values present in the intersectoral matrices of the two tables.

$$\frac{q_{2019} * p_{2019}}{q_{2019} * p_{2011}} = \frac{p_{2019}}{p_{2011}} \tag{20}$$

In the formula, $w_{i,t}$ represents the value share of the asset produced by sector $j$ on the total value of the aggregate for period t:

$$w_{i,t} = \frac{p_{i,t} * q_{i,t}}{\sum_{i} p_{i,t} * q_{i,t}} \tag{21}$$

The above also applies to $w_{i,t-n}$. Subsequently, the input–output table for 2019 is adjusted for inflation using the Törnqvist price index, following which the TFPS calculation methodology is applied to derive $TFPS^{*}_{ij}$. Finally, the market surplus ($MS_{ij}$) is computed as the residual value:

$$MS_{ij} = PPT_{ij} - TFPS^{*}_{ij} \tag{22}$$

It is crucial to note that the direction of the sectoral $PPT_{ij}$ relies on the signs of $TFPS^{*}_{ij}$ and $MS_{ij}$. The likely combinations are as follows:

$$PPT_{ij}>0 \quad \text{if} \quad \begin{array}{l} TFPS^{*}_{ij}>0 \\ TFPS^{*}_{ij}>0 \\ TFPS^{*}_{ij}<0 \end{array} \quad \text{and} \quad \begin{array}{l} MS_{ij}>0 \\ MS_{ij}<0 \\ MS_{ij}>0 \end{array}$$

$$PPT_{ij}<0 \quad \text{if} \quad \begin{array}{l} TFPS^{*}_{ij}<0 \\ TFPS^{*}_{ij}>0 \\ TFPS^{*}_{ij}<0 \end{array} \quad \text{and} \quad \begin{array}{l} MS_{ij}<0 \\ MS_{ij}<0 \\ MS_{ij}>0 \end{array}$$

By employing equation (19), a comprehensive set of $TFPS^{*}_{ij}$ is evaluated, and the findings are presented in figure 8 below. In Italy, the first three sectors all have negative technological performance (Optimal TFP) but, thanks to a transfer of MS, they are still able to distribute PPT as we observed in the previous paragraph. In the case of the energy sector, the main beneficiaries of the reduction in MS are the intermediate sectors, while in the case of waste treatment, the reduction in MS is partly financed by a net inflow of resources from abroad. Finally, in the case of air transport, the transfer of MS more than compensates for the negative technological performance and contributes in part to generating a significant flow of resources abroad.

A diametrically opposite situation is observed for the three sectors that instead absorb PPT despite starting from positive technological performance, but counterbalanced by a significant increase in MS. In the case of metallurgy, the significant increase in MS is accompanied by a significant net inflow of resources from abroad. This is not the case in telecommunications, and finally in the insurance sector, it is mainly the intermediate sectors that suffer from this increase in MS.

The situation in France is more complex. Of the three sectors that primarily distribute PPT, the first, Chemicals, starts with a positive optimal TFPS and achieves that anomalous result precisely thanks to the exceptional transfer of MS determined by the abnormal value of the inventory deflator. The other two sectors, but especially the motor vehicle sector, start with a negative technological performance and fully recover thanks to the transfer of market power. For the other three sectors, the representation already seen for Italy applies, starting from a positive TFPS* and then the strong increase in MS ultimately leads to the absorption of PPT reported in the previous paragraph.

The largest increase in MS observed in the case of agriculture and livestock harms intermediate sectors and results in a net deficit of resources through external trade channels. A similar but even more detrimental situation for intermediate sectors is observed in the warehousing sector. Finally, a similar situation but without the foreign component is observed in the case of commerce.

Figure 8: TFPS*, MS and PPT in Italy and France, 2011 – 2019; values in millions of Euros.

**Italia**

| IOT prezzi 2011 | Scol-Srig | Imp-Exp | TFPS* | Scol-Srig | Imp-Ex | MS | Scol-Srig | Imp-Exp | PPT |
|---|---|---|---|---|---|---|---|---|---|
| Electricity, gas, steam and air conditioning | -8663 | -110 | -7626 | 10326 | -82 | 10919 | 1664 | -191 | 3293 |
| Sewerage, waste management, remediati | -2197 | -131 | -1742 | 1219 | -334 | 2467 | -977 | -465 | 725 |
| Air transport | -138 | -338 | -603 | 789 | 934 | 2271 | 651 | 596 | 1668 |
| Manufacture of basic metals | 3163 | -2189 | 1556 | 2323 | -1063 | -2962 | 5486 | -3253 | -1406 |
| Telecommunications | 865 | -392 | 1142 | 3764 | 256 | -2412 | 4630 | -136 | -1270 |
| Insurance, reinsurance and pension fundi | 253 | -107 | 203 | -2422 | 67 | -1033 | -2169 | -40 | -830 |

**FRANCIA**

| IOT prezzi 2011 | Scol-Srig | Imp-Exp | TFPS* | Scol-Srig | Imp-Ex | Msurpl | Scol-Srig | Imp-Exp | PPT |
|---|---|---|---|---|---|---|---|---|---|
| Manufacture of chemicals and chemical p | 2112 | -2300 | 1121 | -481 | 2292 | 20390 | 1632 | -8 | 21512 |
| Manufacture of motor vehicles, trailers ar | -280 | -2877 | -5022 | 6071 | -1263 | 6496 | 5791 | -4140 | 1474 |
| Water transport | 220 | -445 | -120 | 2532 | 2205 | 1903 | 2752 | 1760 | 1783 |
| Crop and animal production, hunting and | -540 | -745 | 46 | -1585 | 1876 | -5376 | -2125 | 1131 | -5330 |
| Wholesale and retail trade and repair of n | 819 | -71 | 853 | -2648 | -123 | -1917 | -1829 | -194 | -1064 |
| Warehousing and support activities for tra | -1429 | -373 | 12 | -8866 | 1073 | -2698 | -10295 | 700 | -2686 |

Source: Own elaboration

## 6. Italy vs France: how will they react to the pandemic and war?

The main evidence of paragraph 5 concerns both countries' highlighting of sectors that reverse their optimal situation (whether positive or negative) based on a reduction vs an increase in market power. This fact strengthens our idea that regardless of the experimental way of measuring market power, it certainly has importance in measuring the contribution of each sector to economic growth. In this paragraph, we want to try to predict how the relationships that each sector has with other sectors, primary factors, and final demand can change based on exceptional events such as war and pandemics, which have characterized the last three years. In general, we can say that: a. the sectors that have performed better during the pandemic are the most competitive ones, b. both during the pandemic and as a result of the war, some sectors have increased prices more than the actual increase in costs, thus increasing their market share, c. in some areas, from energy to food, initial price increases justified by energy price increases have been fueled by speculative dynamics unrelated to cost increases.

In the first group of sectors, we have considered those that, in our opinion, have been positively influenced by the pandemic (first three) and by the war (fourth and fifth). In summary, the following can be said. In the pharmaceutical sector, the situation is similar in both countries, although in Italy the recovery from negative technological performance is greater because the market Surplus (MS) is reduced more. The opposite happens in the production of PCs and electronic equipment. Healthcare is characterized in both countries by a positive Optimal Total Factor Productivity Surplus and an increase in market surplus, which ultimately results in a reduction in Purchasing Power Transfers (PPT). Certainly, the pandemic has affected the prices and profits of the first two sectors, but also the ability of healthcare services to increase their market surplus through price increases. As for the second group of sectors, it can be said that the transfer of market surplus observed in Italy will certainly be slowed down by the rise in energy prices. The situation in France is very different, where between 2011 and 2019, the market surplus increased. Finally, regarding

the banking sector, we can emphasize that while in Italy the sector shows a TFPS*>0 and a reduction in its market surplus, the same sector in France is characterized by a strongly negative TFPS* partly hidden by the transfer of market surplus. Therefore, while in Italy this characterization would lead to imagine a benefit resulting from the war but not determined by the rent situation of the sector, in France it is expected that this sector will receive a lot and transfer very little.

In the second group of sectors, we have those that are negatively influenced by the two events considered. Among those negatively affected by the pandemic, we have the construction sector, which, while starting from a positive technological performance in Italy and reducing its MS, manages to distribute even more PPT in the end. In France, however, the sector completely hides its negative technological performance thanks to an equal reduction of its MS. In the hospitality sector (restaurants and hotels), heavily impacted by the pandemic, in Italy, we start from a TFPS*>0, but the strong increase in prices determines an increase in rent-seeking positions, and ultimately, the sector becomes a net absorber of PPT. On the contrary, in France, the negative technological performance of the sector is entirely hidden by a reduction in prices that results in an equal reduction of its MS. In France, a similar situation occurs in the travel agency sector, which also hides its negative technological performance in Italy with a reduction of MS. The war has had a negative impact on land transportation costs and, secondarily, on the costs of managing real estate activities due to the increase in energy costs. In the first case, Italy and France show similar situations in the sense that they can partially mask TFPS*<0 only with a reduction in MS. In the case of real estate, however, the situation in the two countries is substantially different. In France, although the sector is very strong from a technological point of view (it is second only to the telecommunications sector for TFPS*), it absorbs almost all of this advantage through an increase in its MS. In Italy, however, we start from a situation of relative small inefficiency, only partially absorbed by a reduction in MS.

Figure 9: Sectors affected by Pandemic and War, 2011 – 2019; values in millions of Euros

| Italy prix 2011 | Scol-Srig | Imp-Exp | TFPS* | Scol-Srig | Imp-Exp | MS | Scol-Srig | Imp-Exp | PPT |
|---|---|---|---|---|---|---|---|---|---|
| Manufacture of basic pharmaceutical products | 233 | -1377 | -979 | 296 | 601 | 1090 | 529 | -775 | 110 |
| Manufacture of computer, electronic and optic | 354 | -1139 | -999 | -671 | -748 | 819 | -317 | -1887 | -180 |
| Human health activities | 1919 | -38 | 1751 | -3136 | 29 | -2452 | -1216 | -10 | -701 |
| Electricity, gas, steam and air conditioning supp | -8663 | -110 | -7626 | 10326 | -82 | 10919 | 1664 | -191 | 3293 |
| Financial service activities, except insurance an | -2396 | -363 | 568 | 4044 | 610 | 273 | 1648 | 247 | 841 |
| Construction | 2312 | -145 | 417 | -49 | 150 | 292 | 2264 | 5 | 710 |
| Accommodation and food service activities | 1254 | -120 | 1647 | 0 | 778 | -2107 | 1254 | 659 | -461 |
| Travel agency, tour operator reservation servic | -104 | -75 | -303 | 87 | 27 | 351 | -17 | -48 | 48 |
| Land transport and transport via pipelines | -3251 | -288 | -1049 | -1580 | 656 | 310 | -4831 | 368 | -739 |
| Real estate activities excluding imputed rents | -3956 | -72 | -305 | 1062 | -29 | 161 | -2894 | -101 | -145 |

| France prix 2011 | Scol-Srig | Imp-Exp | TFPS* | Scol-Srig | Imp-Exp | Msurpl | Scol-Srig | Imp-Exp | PPT |
|---|---|---|---|---|---|---|---|---|---|
| Manufacture of basic pharmaceutical products | 647 | -1336 | -599 | -1452 | 600 | 305 | -805 | -736 | -295 |
| Manufacture of computer, electronic and optic | 987 | -1949 | -853 | 2863 | -8697 | 968 | 3850 | -10646 | 115 |
| Human health activities | 419 | -56 | 2109 | -112 | 47 | -2223 | 307 | -9 | -114 |
| Electricity, gas, steam and air conditioning supp | -680 | -85 | 275 | -2522 | 863 | -389 | -3202 | 778 | -114 |
| Financial service activities, except insurance an | -5950 | -472 | -3340 | 11592 | -638 | 2737 | 5642 | -1110 | -604 |
| Construction | 1190 | 0 | -4767 | 1791 | 0 | 4683 | 2981 | 0 | -84 |
| Accommodation and food service activities | -1923 | 0 | -1813 | 3782 | 0 | 1735 | 1859 | 0 | -78 |
| Travel agency, tour operator reservation servic | -184 | 0 | -145 | -70 | 0 | 100 | -254 | 0 | -45 |
| Land transport and transport via pipelines | -1834 | -908 | -939 | -1876 | 792 | 688 | -3710 | -117 | -251 |
| Real estate activities excluding imputed rents | 3690 | 0 | 6999 | -7906 | 0 | -6750 | -4216 | 0 | 250 |

Source: Own elaboration

## 7. Conclusions

### *7.1. The evaluative question*

With this paper, we aimed to understand how the industrial systems of the two countries were tested by the pandemic and war, and we also sought to investigate, at a sectoral level, what conditions lead to a sector creating or absorbing resources from other sectors. If these dynamics are known, it is possible to counteract rent-seeking positions and Market Power (which determines the MS) of sectors advantaged by the pandemic and war. Our method of sectoral analysis would therefore prove to be a very useful tool for decision-makers in addressing those exceptional situations that we have only been able to observe and suffer at a macro and aggregate level, but certainly not controlled and corrected.

In paragraph 2, we described the main macroeconomic trends of the two countries, which showed a substantial difference in relation to the levels of capital productivity in ICT and TFP trends. In the period 2009-2019, there is then confirmation of the relationships between var Rapp and MFP for France (remaining in the second quadrant where increases in MFP do not translate into a reduction in inequality) and a change for Italy, which thus moves from the second to the fourth quadrant, where the reduction in MFP is accompanied by an increase in inequality. These differences in macroeconomic levels, the most aggregated possible, were then the subject of a sectoral analysis that revealed the differences between the two countries.

In paragraph 4, an inability of Italy and France to create PPT is emphasized, as well as a transfer of resources from final demand to VA components. At the level of individual countries, there are differentiated

situations in which the sectors that create PPT and those that absorb PPT are different in the two countries. For these reasons, in paragraph 5, we tried to take into consideration a subset of sectors, those that we believe have been most influenced (both positively and negatively) by the two exceptional events. Among those positively influenced by the pandemic, the situation in the two countries is substantially similar, and therefore it is expected that it will have the same impact in both countries on the prices and profits of the first two sectors and on the ability of healthcare services to control their MS through price leverage. If, on the other hand, we consider the two sectors influenced by the war, there are markedly different behaviors. The energy sector will certainly see substantial changes in the current redistributive structure; in Italy, the transfer of MS will certainly be slowed down by the rise in prices over the last two years. In France, however, the relative energy independence will likely result in greater protection for end-users. The banking sector also appears to be characterized differently in the two countries. The greater competitiveness of the sector in Italy compared to France leads us to think that in Italy, it will take less advantage of the increase in prices and the rise in interest rates than in France. Our hypotheses about the reaction of the two productive systems can be verified in the coming years when the IOTs for these years are published.

When a sector produces TFPS and does not hold back the surplus due to healthy competition, the other sectors that exchange goods with it benefit from the surplus as well. This means that TFPS created in one sector can spread to other sectors. Therefore, policymakers aim to limit Market Surplus situations and remove barriers that protect a specific sector to allow the TFPS to flow freely. During times of inflation, such as the current situation following the war, this becomes even more crucial, as noted by Babeau (1978) and previously by Masse and Bernard (1969). To prevent Market Surplus situations that can hinder the economy's full recovery and lead to speculative maneuvers, policymakers should incorporate measures of TFPS and Market Surplus into their models.

### *7.2. How to improve the method?*

Our methodology focuses on three areas for in-depth analysis from a theoretical standpoint. Firstly, estimating labor and capital prices is crucial to understanding the mechanism behind surplus redistribution. To measure the portion of Total Factor Productivity (TFPS) absorbed by labor, the new decomposition of labor productivity suggested by He and Walheer (2021) could be a valuable tool. A similar approach should be used to estimate the price of capital, and for this purpose, it will be necessary to work with the different productivity measures produced by OECD and Eurostat. Collaboration with ISTAT will be essential.

Secondly, we intend to deepen the relationship between the three dimensions of analysis: microeconomic, mesoeconomic, and macroeconomic. The surplus accounting method was initially developed following two distinct strands. The first, the microeconomic one, gave rise to the MAP (Methode d'Analyse des Performances), which today integrates with the social balance sheets of companies and with those tools that seek to take into account the company's contribution to the development not only of the economy but also of the territory in which it operates. The other strand is the macroeconomic one, which was revived in the 20th century by Sraffa (1972)[2], developed by CERC in the 1970s, and regained vigor with Piketty (2014), to whom

[2]According to Sraffa, the surplus was distributed among the factors of production based on their relative power, rather than their marginal productivity as advocated by neoclassical theory. Sraffa emphasized the importance of considering the interdependence between economic sectors to understand the distribution of the surplus and income.

the second paragraph is dedicated. In this paper, we attempted a first reconciliation of the mesoeconomic dimension with the macroeconomic one, but it is clear that the design needs to be improved and, above all, completed with the insertion of information from the microeconomic level, at least in the component of "national champions" or leading companies.

Finally, we aim to incorporate our measures into CGE (Computable General Equilibrium) models to analyze the redistribution of productivity surpluses and innovation and technology transfer policies adequately. CGE models are helpful in determining the short and long-term effects of investment policy producing productivity gains. These models are also useful for simulating how to attain desirable goals by means of public policies, such as economic growth and social inclusion. Thus, it would be possible to use such models to understand how policies that guarantee long-term objectives, such as investments in human capital, can be financed based on the virtuous behavior of some sectors and their ability to redistribute their productivity gains among economic agents. Policymakers can use such a model to consider productivity gains and allocate welfare gains to different economic agents. This mechanism ensures that non-market or less attractive sectors can be supported from a perspective of integrated territorial development. An example could be the tourism of coastal areas that transfers PPT (Productivity-Preserving Transfers) to the tourism of inland areas to maintain certain popular traditions, as well as biodiversity and specific food characteristics. More generally, this symbiosis between sectors important for the cultural growth of a community and sectors performing well from an economic point of view is what guarantees the social sustainability of development models.

## 8. References


Antille G, Fontela E (2003) The terms of trade and the international transfers of productivity gains. *Econ Syst Res* 15: 3–19. https://doi.org/10.1080/0953531032000056918

Babeau A (1978) The Application of the Constant Price Method for Evaluating the Transfer Related to Inflation: the Case of French Households. *Rev Income Wealth* 24: 391–414. https://doi.org/10.1111/j.1475-4991.1978.tb00066.x

Eurostat SUT tables (2022), availables from: `https://ec.europa.eu/eurostat/data/database`

Flexner W (1959) An Analysis of the Nature of Aggregates at Constant Price. *Rev Econ Stat* 41: 400–404. https://doi.org/10.2307/1927267

Fontela E (1989) Industrial structure and economic growth: An input output perspective. *Econ Sys Res* 1: 45–52. https://doi.org/10.1080/09535318900000004

Fontela E (1994) Inter-industry distribution of productivity gains. *Econ Sys Res* 6: 227–236. https://doi.org/10.1080/09535319400000020

Garau G (1996) La distribution des gains de la croissance: une analyse entrees sorties. ed. Lang, Berna.

Garau G (2022) Total factor productivity and relative prices: the case of Italy *Nat Account Rev* 4(1): 16–37.

Garau G, Lecca P (2015) The impact of regional R & D subsidy in a computable general equilibrium model. *Int Regional Sci Rev* 38: 319–357.

Masse P, Bernard P (1969) Les dividends du progrés. ed. du Seuil, Paris.

Oxfam Report (2023), available at https://www.oxfam.org/en/what-we-do/issues/extreme-inequality-and-essential-services

Piketty T (2014) *Il capitale nel XXI secolo* ed. Bompiani, Milano.

Sraffa P (1972) *Produzione di merci a mezzo di merci* ed. Einaudi paperbacks, Torino.

Stiglitz (2016) Disuguaglianza e crescita economica. in Mazzuccato M, M Jacobs(2016) *Ripensare il capitalismo* ed. Anticorpi Laterza

Wolff E N (1989) Dynamics of Growth in Input-Output Analysis. *OECD International Seminar on Science Technology and Economic Growth, June Paris.*