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Welfare resilience in the first month of COVID-19 pandemic in Italy

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Abstract:
This paper analyses the extent to which the Italian welfare system provides a monetary compensation for those who lost their earnings due to the lockdown imposed by the government in order to contain the COVID-19 pandemic in March 2020.
In order to assess the potential impact of the first-order effects of the businesses temporarily shut down and the policy measures introduced by the government on household income, counterfactual scenarios are simulated by using EUROMOD, the EU-wide microsimulation model, integrated with information on the workers more likely to be affected by the lockdown. This paper provides timely evidence on the differing degrees of relative and absolute resilience of the household incomes of the individuals affected by the lockdown. These arise from the variations in the protection offered by the tax-benefit system and from the personal and household circumstances of those most recently at risk of earning losses.

Keywords**:** pandemic, household income, microsimulation, Italy.

Note: We thank Manos Matsaganis and Alberto Tumino for comments on a preliminary version. The methodology draws on Fernandez Salgado et al. (2014). We use EUROMOD (version I2.0+) which is developed and managed by the Institute for Social and Economic Research (ISER) at the University of Essex, in collaboration with the European Commission - JRC Seville and national teams from the EU member states. We are indebted to Holly Sutherland and the many people who have contributed to the development of EUROMOD. The process of extending and updating EUROMOD is financially supported by the European Union Programme for Employment and Social Innovation 'Easi' (2014-2020). We make use of microdata from the Italian versions of the SILC data made available by ISTAT. Data providers bear no responsibility for the analysis or interpretation of the data reported here. Any mistakes are the authors' only.

1. Introduction

The effects of the COVID-19 pandemic on the world-wide economy can lead to an economic downturn worse than the one that characterised the 2008 Great Recession. The potential impact on the GDP, although mostly unpredictable today without a clear knowledge of the boundaries of the health emergency, can lead to a massive slump in economic development (Dorn et al. 2020) depending on the scenarios.

Italy has been the frontrunner in terms of exposure to the virus in Europe and it experienced the boom of infections between the end of February 2020 and March 2020. As a consequence, the Italian government issued various decree laws in order to limit economic activities with the aim of preventing social contacts among individuals in the attempt to limit the spread of the virus. Dorn et al. (2020) estimates that a two-month shutdown would lead to a reduction of annual GDP growth by 8–13 percentage points. Qualitative indicators already show the effect of the unprecedent demand and supply shock due to the COVID-19 pandemic. The business confidence climate index crashed from 97.8 to 81.7. The confidence index in manufacturing drastically reduced passing from 98.8 to 89.5 (Istat, 2020)

OECD estimates of the initial direct impact of shutdowns, reveal that the decline of output would be between 20% and 25% with consumers' expenditure dropping by 33%. Such a decline in the level of output would correspond to a decline in annual GDP growth of around 2 percentage points for each month of shutdown (OECD 2020a).
Focusing on the situations faced by workers, the International Labour Organization estimates a rise in global unemployment of between 3% and 13 %, with underemployment expected to increase on a large scale and the decline in economic activity and constraints on people's movements impacting both manufacturing and services (ILO, 2020)

The adverse impact of the necessary containment measures to the COVID-19 pandemic has determined an unprecedent demand and supply shock to international growth prospects. Financial markets reacted with a sharp increase of volatility and fall in assets prices. The outlook for World trade, which was already declining in January, worsen dramatically in March (Istat, 2020). Nevertheless it is obvious that the cost of a government inaction would have been much higher in terms of human lives and long term recovery.

The picture described above, as well as the lessons of previous recessions, suggest that the downturn due to the COVID-19 pandemic will overshadow European economies for years to come, through legacies such as unemployment and public debt and with long-lasting impacts on household incomes as already experienced during the Great Recession (Jenkins et al., 2013).

Nevertheless, governments "can prevent a very sharp but short recession becoming a long-lasting depression", acting as payer of last resort, providing insurance to the affected workers making sure that cash flows to idle workers and businesses immediately (Saez and Zucman, 2020). Dolls et al. (2012) show that the automatic stabilizers differ greatly across countries particularly in the case of asymmetric shocks. Nevertheless, governments have introduced discretionary policy measures to support the most vulnerable (OECD, 2020b)

The primary aim of this paper is to offer a scenario, rather than a forecast, in order to understand, in a timely fashion, the extent to which the Italian tax-benefit system provides income stabilisation, in the first month of the health emergency, for those who lost their earnings at the onset of the COVID-19 pandemic. In particular, we aim to measure the amount of income insurance that individuals and their households receive from the Welfare State against the hazard of the economic shutdown. The consequences of the shutdown on the most vulnerable individuals depend on their individual characteristics and the interaction between their labour market participation, their living arrangements and the capacity of the tax and

benefit systems. We refrain from considering other aspects such as the reduced likelihood to get a job for those who are looking for it and the wider consequences of macro-economic feedbacks.

Lack of longitudinal up-to-date information on household income and labour market circumstances, usually available only few years after the economic shock and in a restricted number of countries, constrains the possibilities for empirical analysis. To address this limitation, we assess the impact of the economic lockdown on household income by means of simulating counterfactual scenarios by using a fiscal microsimulation approach (Figari, Paulus, Sutherland, 2015). First, we attempt to identify the workers affected by the lockdown by using aggregate data on employment shares by activity sectors. Second, we estimate the household incomes of individuals who lose their earnings, considering the direct cushioning effect of the tax-benefit system and the way they depend on the remaining household market income and personal/household characteristics. The use of tax-benefit microsimulation models to consider how the welfare systems protect people from an extreme shock has become known as "stress test" of the tax-benefit system (Atkinson, 2009) and increasingly applied to analyse the consequences of the Great Recession (Figari et al., 2014, Jenkins et al., 2013).

We highlight the main motivations to exploit such an approach in section 2. In the same section we introduce EUROMOD and we describe the indicators we apply to capture the resilience of the welfare system in both relative and absolute terms. Section 3 provides a snapshot of the characteristics of those affected by earning loss.

The current analysis focuses on Italy but it is about to be extended to other EU countries in order to highlight the interaction between the country-specific effects of the pandemic and the policy responses implemented by the national governments and to generalise the impact of the COVID-19 pandemic in a cross-country perspective, The most relevant features of the policy measures included in the analysis are described in section 4.

Empirical evidence of the different aspects of the income stabilisation offered by the tax-benefit system is presented in section 5, showing the differing degrees to which the earning loss has the potential to reduce household incomes, and the extent of resilience of those incomes due to the protection offered by the tax-benefit system. Section 6 concludes, summarising the main findings and suggesting some research developments for the near future.

2. Empirical methodology

2.1. Stress testing the tax-benefit systems

In presence of a sudden economic shock, with direct consequences for the labour market participation of individuals, coupled with fiscal policies implemented to react to unexpected earning losses, it is necessary to understand how contemporary tax-benefit systems react to changes in individual circumstances. And, more importantly, it is necessary to assess the extent to which household incomes are protected by the tax-benefit systems.

The stress test approach is common in financial institutions to test the sensitivity of a portfolio to a set of extreme but plausible shocks and to assess the significance of the system's vulnerabilities (Jones et al., 2004). We follow Tony Atkinson's suggestion of extending the same approach to tax-benefit systems in order to predict the cushioning effects of the social protection schemes in the event of a loss of market incomes and to assess the overall income stabilisation after a macroeconomic shock (Atkinson 2009, Fernandez Salgado et al., 2014).

A stress test exercise can provide evidence of the effects of either a hypothetical macro-economic shock or a contemporary shock for which survey data covering the period of interest

are not yet available. The latter option is the one we follow to assess the variation in the social impact of the earning loss due to the economic shutdown at the onset of the COVID-19 pandemic in Italy. In due course, survey data collected over the period of the pandemic will provide evidence of the evolution of the income distribution and analysis of longitudinal data will show us how incomes changed for those directly affected due to economic lockdown. However, it is important to assess the economic impact of specific aspects of the pandemic and to inform the policy debate in a timely fashion.

By using a fiscal microsimulation model which combines detailed survey data, representative of the national population, on market incomes and household characteristics and tax-benefit rules (Figari, Paulus, Sutherland, 2015), we can determine the different components of household disposable income under different counterfactual scenarios in which, as a consequence of an economic shock, we identify the individuals more likely to lose their earnings.

The simulated household disposable income of the individuals depends on the cushioning effect of automatic stabilizers existing in the country in the form of income taxes and social contributions, contributory benefits for those who lose their earnings (if entitled), other means-tested benefits and tax credits designed to protect families on low income, and other household incomes, in the form of earnings of those still in work as well as pensions and benefits, received by other household members. In addition, it is crucial to capture the effects of the discretionary policies that the government might decide to implement in order to prevent a sudden fall in household income.

The stress test approach allows us to focus on a specific aspect of the economic shock, highlighting the direct compensation provided by tax-benefit systems rather than that arising from other adaptive changes in individual behaviours. In this paper we focus exclusively on the loss of earnings as one of the channels through which the COVID-19 pandemic affects directly individuals' well-being. The overall effect of the pandemic on the income distribution is likely to be affected by general equilibrium consequences and other behavioural responses. However, individuals and households directly affected by earning loss suffer to a large extent and it is important to assess the extent to which the welfare system helps to stabilise their income and whether there are specific weaknesses in the policy instruments in operation.

2.2. Counterfactual scenario derived using EUROMOD

We exploit the potential of the microsimulation techniques to define the counterfactual scenario (Figari et al., 2015), based on survey data representative of the national population before the onset of the pandemic, in which we impute the earning loss as observed in March 2020 and we simulate the discretionary policy measured implemented in the same month.

We make use EUROMOD, the EU-wide tax-benefit microsimulation model. EUROMOD simulates tax liabilities (direct tax and social insurance contributions) and benefit entitlements for the household populations of EU Member States in a comparable way across countries on the basis of the tax-benefit rules in place and information available in the underlying datasets. The components of the tax-benefit systems which are not simulated (e.g. old age pensions) are taken from the data, along with information on original incomes. The simulation of the Wage Supplementation Scheme (*Cassa Integrazione Guadagni*) is based on reported earnings, where relevant, and under assumptions about contributions made in the past derived from the limited information available in the data. See Sutherland and Figari (2013) for further information.

The underlying micro data come from the 2017 national version of the EU-SILC provided by Istat. The analysis in this paper is based on the tax-benefit rules in place in 2019 (as of June

30th) which are the substantially the same as those in place in March 2020. Monetary values of non-simulated income components referring to 2016 have been updated to 2019 according to actual changes in prices and incomes over the relevant period, as documented in the Italian EUROMOD Country Report (Ceriani et al. 2019). No adjustment is made for changes in population composition between 2016 and 2019.

In the analysis we focus on what happens in a single month, i.e. March 2020. We compute household disposable income, taking account the discretionary measures included in the Decree Law 18/2020 ("*Cura Italia*") and detailed in the next section.

Given the extraordinary and sudden decision of the government to impose a generalised economic lockdown, the traditional automatic stabilizers embedded in the tax-benefit systems are not allowed to operate, with the exception of income tax and social contributions which are lower due to the lower level of earnings. The existing income-tested benefits (i.e. bonus IRPEF, Family allowances (ANF), Citizenship income (RdC)) based on income and means-test of the previous fiscal year do not react to the loss of earnings experienced in March 2020. The opportunity to modify the design of the existing income support mechanism to deal with the economic effects of the pandemic is part of the policy debate in Italy (Forum Diseguaglianze Diversità and ASviS, 2020) and we refer to this in the Conclusions.

We aim to highlight the amount of insurance coverage guaranteed directly by government, independently of any potential change in the behaviour of family members which could occur in the short or long term. Furthermore, given the incidence of the shadow economy in Italy, gross self-employed income has been calibrated in order to obtain an aggregate amount corresponding to that reported in fiscal data (Fiorio and D'Amuri, 2006) and we assume there are no changes in the tax evasion behaviour as a consequence of the shock.

2.3. Income stabilisation indicators

Our analysis focuses on both relative and absolute resilience provided by the welfare state, taking into account the interactions of the tax-benefit policies with other existing household income and household composition.

First, in order to assess the level of stabilisation of incomes relative to the pre-shock baseline, we employ the Net Replacement Rate (Immervoll and O'Donoghue, 2004). It gives an indication of the extent of the remaining disposable income for those affected by the economic lockdown:

$$\text{Net Replacement Rate} = \frac{\text{Y}_{\text{post}}}{\text{Y}_{\text{pre}}}$$

where Y is Household Disposable income made up of Original Income plus Benefits, minus Taxes; Ypost and Ypre refer to the income after and before the earning shock respectively.

In addition to any form of market income, Original Income includes other sources of personal income as well, such as private inter-household transfers and alimonies. Even in the lockdown scenario where we simulate the earning shock, household original income may be positive due to income from savings, private pensions, inter-household transfers or the earnings of other household members. Income from savings could be seen as another channel of self-insurance but given the poor quality of the underlying data we treat them as one of the components of Original Income without highlighting their specific role.

In order to analyse the channels through which relative resilience is transmitted, we decompose the Net Replacement Rate by income source:

$$\text{Net Replacement Rate} = \frac{O_{post} + B_{post} - T_{post}}{Y_{pre}}$$

where O is the Original Income, B is the sum of Benefits and T includes Income Taxes and Social Insurance Contributions paid by employees and the self-employed.

Benefits are made of *i)* Wage-integration Benefits (*Cassa Integrazione Guadagni*), *ii)* COVID Benefit (i.e. newly discretionary policies such as lump sum transfers to self-employed and employees) iii) Housing Benefits (i.e. amount equivalent to the mortgage instalment for the main residence) iv) Other Benefits (i.e. pension and invalidity benefits; minimum income schemes; family benefits).

Moreover, in order to measure the extent of protection offered by public support, we employ a new indicator, namely the Compensation Rate (Figari et al. 2014) which measures the proportion of net earnings lost due to the economic lockdown, compensated by public transfers net of taxes:

$$\text{Compensation Rate} = \frac{(B_{post} - B_{pre}) - (T_{(B_{post})} - T_{(B_{pre})})}{(E_{pre} - E_{post})}$$

where the difference in the net earnings before and after the shock represents the income lost due to the lockdown, which is compensated by more generous net benefits. To derive net measures, taxes are allocated proportionally to each income source.

This new indicator allows us to isolate the net public support from the effect of other earnings present in the household of a worker affected by the lockdown, which usually play an important role in determining the income after an individual employment shock. The compensation rate gives us a direct indication of the net public contribution as proportion of the net market income lost due to the lockdown. Furthermore, we decompose the compensation rate in the same way as the Net Replacement Rate to highlight the contribution of each group of benefits.

In order to test whether the income stabilisation offered by the tax-benefit systems prevents those affected by the lockdown from falling below an absolute income threshold, we compare the equivalised disposable income before and after the lockdown to the poverty threshold at 60% of the median in the pre-shock baseline, without and with the discretionary policy measures implemented by the government.

Our approach is equivalent to calculating absolute poverty rates with a fixed poverty line and resembles the suggested practice in the measurement of poverty during an economic crisis of using a threshold fixed in real terms (Jenkins et al., 2013). Such an indicator can be considered as an appropriate proxy for the experience of impoverishment that an individual faces, comparing his/her current condition with his/her own status before the earning shock (Matsaganis and Leventi, 2011). A normative judgment of the proper level of protection provided by the welfare systems is beyond the scope of this paper and should be evaluated considering the minimum levels of living standards guaranteed by the welfare system as a whole (Boadway and Keen, 2000). However, given the policy goal of limiting the numbers of individuals at risk of poverty, it is implicit that household income of those affected by the lockdown should not fall below the poverty threshold.

Before moving to the results of the empirical analysis, it is important to highlight that we do consider the hypothetical situation of one month in isolation (i.e. March 2020, when the government imposed the shut-down and the first compensation measures have been

implemented). Our considerations abstract from the smoothing possibilities of the income shock that an individual can exploit over a longer period of time. and our indicators.

Furthermore, our main indicators – Net Replacement Rate, Compensation Rate and poverty status of individuals affected by the hut-down – are relative to the set of individuals identified as those affected by the shut-down and depend on their characteristics but not on their absolute numbers which affect the estimated budgetary costs and estimates of poverty and inequality of overall population.

3. The characteristics of those affected by earning loss

The analysis focuses on employed and self-employed individuals who lost their earnings at the onset of the COVID-19 pandemic.

We start from the economic sectors, at a detail of 6 digits of ATECO codes, listed in the Decree Law that imposed the shutdown of economic activities.[1] Unfortunately, SILC microdata do not contain information on the economic sectors at the 6 digits detail of the ATECO classification. We draw on other detailed available statistics released by Istat, namely the operating firms archive (ASIA), the national labour force survey (RCFL) and National Accounts, in order to compute the occupation shares in each sector listed subject to shut down.

The left part of the Table 1, based on information from detailed statistics from Istat, shows that[2] 39% of workers are subject to the shutdown, with different share across economic sectors: more than 60% of workers active in the manufacturing and construction sectors, more than 80% of those in the wholesale and retail trade sector, accommodation and food service activities, all those in real estates, arts, entertainment and recreation activities.

We then select randomly the individuals, with positive income source from either employment or self-employment, who report working in a specific sector, at 2 digits detail of the ATECO classification, in the EUROMOD data in order to get the same occupation shares subject to shut down. In EUROMOD we identify 27 million individuals with a positive income source from employment, temporary jobs or self-employment reported in the income reference year (i.e. 20016). As expected, this number is higher than the 23 million individuals reported in the Istat statistics which refer to those with regular employment contract.

Moreover, the shares, shown in the right part of Table 1, do not always correspond to those from the left part. They can lower because individuals working in the public sector are not affected by the shut down in terms of salary and hence not selected in EUROMOD. They can higher because the number of individuals observed in some sectors is too limited in order to select the right amount from the left part of the Table.

Overall, we identify 11 million workers potentially at risk of losing their earnings as they are active, with a private employer, in one of the economic sectors subject to the shutdown.

We plan to extend this analysis as soon as administrative data (COB) or Labour Force Survey are available where one can identify those who actually suffered the income loss.

[1] (Decree Law of the Minister of Economic Development which updates the DPCM 22/3/2020 available here https://www.gazzettaufficiale.it/eli/id/2020/03/26/20A01877/sg

[2] For the sake of simplicity the table reports economic sectors at 1digit detail of the ATECO classification.

Table 1. Workers subject to shutdown by sectors of economic activities

		ISTAT			EUROMOD		
	Economic activity	Workers	Workers subjects to shut down		Workers	Workers subjects to shut down	
		thousands	thousands	%	thousands	thousands	%
A	AGRICULTURE, FORESTRY AND FISHING	909	55	6.02	1,167	15	1.32
B	MINING AND QUARRYING	25	15	60.65	81	58	71.79
C	MANUFACTURING	4,321	2,825	65.38	5,087	3,627	71.30
D	ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY	114	0	0.00	135	0	0.00
E	WATER SUPPLY; SEWERAGE, WASTE ACTIVITIES	243	0	0.00	181	0	0.00
F	CONSTRUCTION	1,339	806	60.17	2,022	1,230	60.80
G	WHOLESALE AND RETAIL TRADE; REPAIR OF VEHICLES	3,287	2,711	82.48	3,804	3,220	84.66
H	TRANSPORTATION AND STORAGE	1,143	0	0.00	1,322	0	0.00
I	ACCOMMODATION AND FOOD SERVICE ACTIVITIES	1,480	1,271	85.86	1,522	1,323	86.93
J	INFORMATION AND COMMUNICATION	618	0	0.00	562	0	0.00
K	FINANCIAL AND INSURANCE ACTIVITIES	636	0	0.00	839	0	0.00
L	REAL ESTATE ACTIVITIES	164	164	100.00	114	113	99.52
M	PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES	1,516	78	5.15	1,909	69	3.60
N	ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES	1,028	362	35.22	902	282	31.21
O	PUBLIC ADMINISTRATION, DEFENCE; SOCIAL SECURITY	1,243	0	0.00	1,680	0	0.00
P	EDUCATION	1,589	0	0.00	2,107	0	0.00
Q	HUMAN HEALTH AND SOCIAL WORK ACTIVITIES	1,922	0	0.00	2,125	0	0.00
R	ARTS, ENTERTAINMENT AND RECREATION	318	318	100.00	268	221	82.54
S	OTHER SERVICE ACTIVITIES	712	523	73.50	895	740	82.62
T	ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS	739	6	0.75	421	17	4.12
U	ACTIVITIES OF EXTRATERRITORIAL ORGANISATIONS AND BODIES	14	14	100.00	8	1	14.06
		23,360	9,148	39	27,151	10,916	40.21

Notes. Our elaboration using ASIA, RCFL and National Accounts and SILC data.

Table 2 reports some characteristics of those affected by the economic shutdown: 37% of them lives in households with some children; 41% of them come from one-earner households and for them the temporary shutdown of their activities imply the loss of the main income source.

The distribution of those affected by the lockdown by household income quintile groups (assessed before the earning loss) shows an increasing pattern with quintile shares ranging from 15% at the bottom of the distribution to 24% at the top.

Table 2. Characteristics of those affected by earnings losses

Presence of children %	36.60
Number of earners %	
1	40.74
2	42.24
3+	13.35
Household income quintile %	
Bottom	14.76
2nd	16.62
3rd	20.99
4th	23.50
Top	24.13

Notes: Summary statistics for those affected by income losses as identified in EUROMOD data. Quintile groups based on household equivalised disposable income in the baseline.
Source: EUROMOD version I2.0+.

4. Income protection policies

The existence in all European countries of a developed welfare state (Schubert et al., 2009), that is intended, among other things, to protect people and their families against economic shocks, is one of the main differences between the crisis faced today and that which occurred in the 1930s. However, the sudden and unexpected shock due to the COVID-19 pandemic forced the European governments to adapt existing measures and to define new discretionary and bold measures in order to support those who are bearing a disproportionate share of the economic burden (OECD, 2020)

Table 3 provides a summary of the most important measures implemented by the Italian government, with the Decree Law 18/2020 ("Cura Italia") to support individuals and their families, and simulated in our analysis.

In order to compensate the earning loss suffered by the employees, the government extended the existing Wage Supplementation Scheme (i.e. *Cassa Integrazione Guadagni, CIG*) relaxing the eligibility conditions and allowing most of employees to be entitled to the scheme. Only domestic workers and consultants (i.e. *parasubordinati*) are not entitled to it. The Wage Supplementation Scheme provides a replacement of 80% of earnings subject to a maximum cap. If monthly earnings are below 2,160 euro the *Cassa Integrazione Guadagni* cannot exceed 940 euro, if earnings are above the threshold the *Cassa Integrazione Guadagni* cannot exceed 1,130 euro. This implies that the replacement can be substantially below 80% for most workers. The government expects to spend, for the first month, up to 3.4 billion euros to finance such scheme (in addition to 1.7 billion euros for credited contributions) and this amount represents the maximum expense allowed. The Scheme is subject to income taxes.

In order to compensate the earning loss suffered by the self-employed, the government defined a new lump-sum transfer of 600 euro to be paid for the month of March to basically all self-employed independently from having suffered an economic loss due to the shock. The self-employed enrolled in particular professional orders (e.g. lawyer, accountants, notaries…) are allowed to get the lump-sum transfer only if their income in the 2019 was below 35,000 euro. The estimated maximum binding expenditure, for the first month, is about 3.1 billion euros. The transfer is not subject to income tax and does not enter in any means-test of other benefits.

Employees who continued to work at firm premises because they could not exploit the possibility of smart-working at home are entitled to a lump-sum transfer of 100 euro to be paid for the month of March. We assume that (randomly) 50% of employees active in the economic sectors not subject to the shutdown are still working at the firm premises. The estimated maximum binding expenditure is about 0.8 billion euros. The transfer is not subject to income tax and does not enter in any means-test of other benefits.

Self-employed can ask to suspend the mortgage on their main residence.[3]

In addition to the policies listed in Table 3, the government allowed employees in the private sector with children up to 12 years old to take parental leave for 15 days at 50% of the earnings or, alternatively, to benefit a babysitting bonus of 600€ (incremented to 1000€ for those working in the health system). We do not simulate these measures due to the lack of information in the data.

Table 3. Simulated policies introduced by the Decree Law 18/2020

Measure	Estimated cost (billion euros)	Target
Wage Supplementation Schemes (i.e. CIG)	3.4 + 1.7 (CIG cost + figurative contributions)	Salary workers excluding temporary workers and housekeeping workers
Lump sum transfer (600€)	3.1	Self-employed (if enrolled in professional order, subject to income limit equal to 35.000€)
Lump sum transfer (100€)	0.8	Employees working at firm premises, subject to income limit equal to 40.000€)
Mortgage suspension		Self-employed

[3] This is a reduction in current expenditures and in our simulations is considered a transfer.

5. Empirical evidence

In our simulations we assume that all individuals working in sectors subject to the shutdown benefits from the discretionary policy measures described above.

Table 4 reports the simulated costs and the number of entitled individuals for each measure.

The Wage Supplementation Scheme would cost around 5.6 billion euros (plus 2.8 billion euros of credit contributions) with 7 millions of workers benefitting from it. The lump sum for the self-employed would cost 1.4 billion euros involving 2.4 million individuals. 5 million workers would benefit from the lump sum of 100€ with a total cost of 0.5 billion euros.

The simulated costs are somehow different from those estimated by the government and validated by the Parliamentary Fiscal Council (UPB, 2020) and reported in Table 3. The main reason deal with the assumptions to define the entitled individuals and related to take-up of the benefits. The government assumes an average take-up rate of around 80% uniform across economic sectors while the Fiscal Council assume differentiated take-up rates across sectors with an overall average of around 60%. In our simulation we assume that 100% of individuals working in the sectors affected by the shut-down are entitled to the Wage Supplementation Schemes and the Lump sum transfer (600€) and the do take-up these benefits. We assume that 50% of those employed in sectors not subject to the lockdown are still working at the firm premises (Fondazione Studi Consulenti del Lavoro, 2020) and they receive the lump sum transfer (100€).

Subject to the reliability of our identification of sectors subject to the shut-down, our scenario can be considered as an upper bound scenario in terms of individuals entitled to receive the benefits and hence the overall cost of the measures. We do assume that all individuals working in the sectors subject to the shut-down are negatively affected (i.e. they lose their earnings) while, in reality, there could be individuals still working due to specific waivers. At the same time, there could be individuals working in the sectors not subject to the shut-down who are negatively affected and we are not able to identify them.

Table 4. Policies introduced by the Decree Law 18/2020: simulated costs and entitled individuals

Policy	Simulated cost		Entitled
	billion euros	% of GDP	thousands
Wage Supplementation Schemes	5.6	0.31	7,013
- Credited Social Contributions	2.8	0.16	
Lump sum transfer (600€)	1.4	0.08	2,360
Lump sum transfer (100€)	0.5	0.03	4,962
Mortgage subsidy	0.15	0.01	363

Notes: Entitled to Wage Supplementation Schemes are individuals with positive employment income, working in sectors subject to the shutdown and not in the public sector. Entitled to Lump sum transfer (600€) are individuals with positive self-employment income, working in sectors subject to the shutdown and not receiving employment income. Entitled to Lump sum transfer (100€) are 50% (randomly selected) of individuals with positive employment income, working in sectors not subject to the lockdown. Source: EUROMOD I2.0+

Overall, the shutdown imposed by the government would imply a loss of original income of around 20 billion euros, representing 1.1% of GDP and around 33% of observed original income before the shutdown. With such a loss of original income, the government would lose

2.7 billion euros of income tax revenue and 5.9 billion euros of social security contributions (including both employer and employee contributions). Regardless additional 7.6 billion euros of transfers (i.e. Wage Supplementation Scheme and lump sum transfers), the loss of disposable income for the families affects by the economic shutdown is around 8 billion euros or 12% of the observed disposable income before the shock.

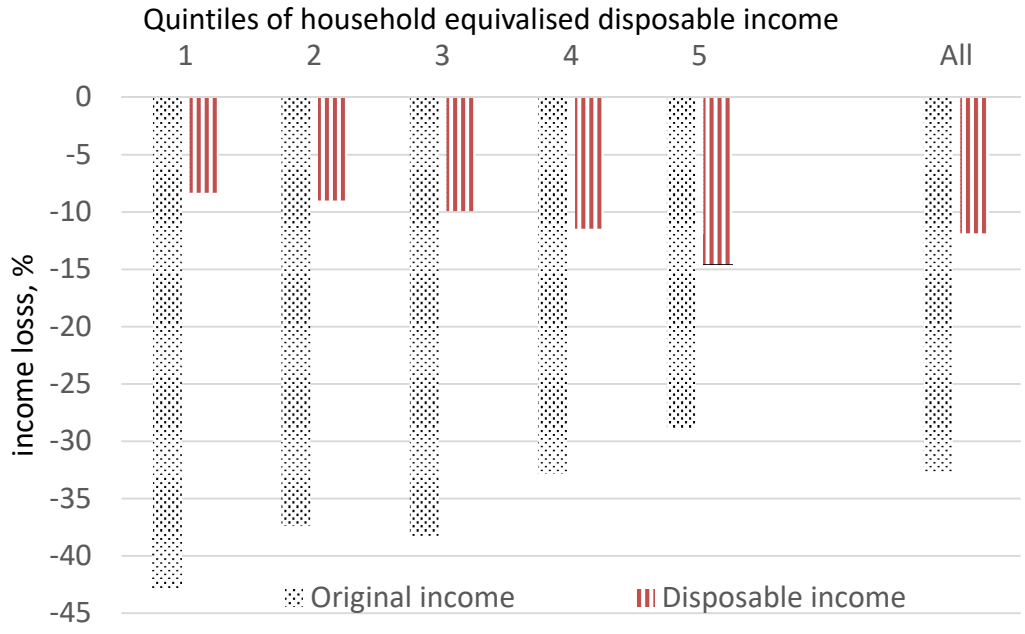
Table 5. Income losses due to the economic shutdown

Income source	billion euros	% of GDP	% change
Original income	-20.2	-1.13	-32.75
Social security contribution employer	-4.0	-0.22	-31.02
Social security contribution employee	-1.9	-0.11	-32.23
Income tax	-2.7	-0.15	-16.38
Transfers	7.6	0.43	27.39
Disposable income	-7.9	-0.44	-11.86

Source: EUROMOD I2.0+

Figure 1 shows the unequal distribution of income losses along quintile groups. Original income losses are more pronounced at the bottom of the distribution: those in the first quintile group would lose more than 40% of their original income while those in the top quintile group less than 30%. This is due to the fact the one-earner families are more concentrated at the bottom of the distribution and the shutdown causes the loss of their main income sources. Along the income distribution, families are characterised by more earners and other income sources (e.g. property and capital income) not affected, in the short term, by the economic shutdown.

Figure 1. Income losses due to the economic shutdown, by household income quintile groups.



Source: EUROMOD I2.0+

Due to these income changes that also hide re-rankings of individuals moving to the bottom part of the distribution when they lose their earnings, one can expect a different level of the inequality of the income distribution after the shock. The Gini of the disposable income distribution is equal to 0.31 before the shutdown and 0.33 after the shutdown, highlighting a non negligible increase in the inequality explained by a larger role of between population groups inequality, namely those affected and those not affected by the shutdown. Without the policy measures introduced by the government the inequality of disposable income would have reached much higher levels, with Gini equal to 0.42.

5.1. Relative resilience

The average Net Replacement Rat is illustrative of the relative resilience due to differences in tax-benefit systems, characteristics of the individuals affected by the shutdown and household composition.

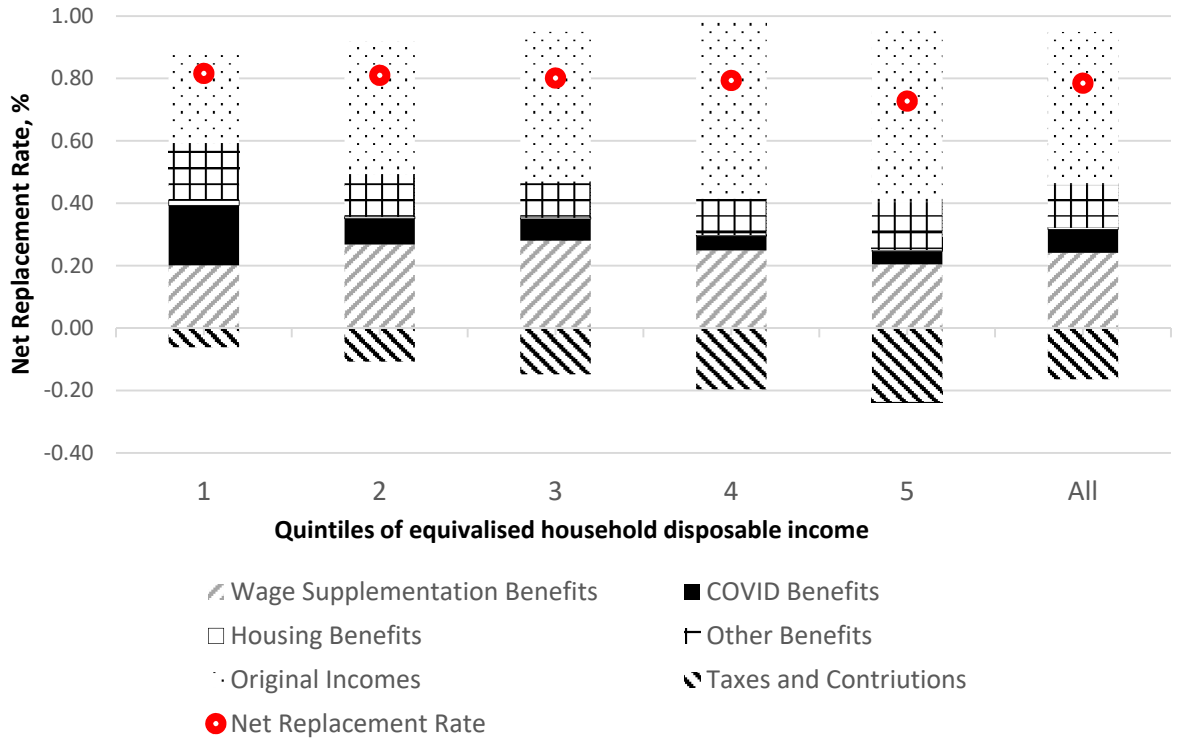
Household income on average falls to as much as 78% of its pre-shock level considering all households with at last one individual affected by the lockdown.

The protective role played by Original Income (including earnings of other household members) is illustrated in Figure 2 which shows the Net Replacement Rates by its components (with Taxes and Contributions reducing the Replacement Rates and hence appearing with the negative sign) and by household income quintile groups. Income from other Benefits (i.e. mainly pensions, disability benefits and income tested benefits) received plays a similar but smaller role. The sum of these two components makes up around 60% of post-shock household income, almost constant along the income distribution with the original incomes less relevant at the bottom of the income distribution and vice versa for the other benefits.

Earnings of other household members are progressively more important as household income increases: the average Net Replacement Rates are likely to be pushed up by the presence of these incomes at the top of the income distribution, but this is partly compensated by progressive income tax. Wage Supplementation Benefits play a large role ranging from 20% to 28% of post-shock household income, with an inverted U shape along the income distribution. COVID Benefits are clearly relevant at the bottom of the distribution where they represent almost 20% of post-shock household income.

The general lesson of this analysis is that it is necessary to look at the social protection system as a whole and how it interacts with household composition and incomes received by other household members. Focusing exclusively on discretionary measures is not enough to have a comprehensive picture.

Figure 2. Decomposition (by income sources) of Net Average Replacement Income for those affected by the lockdown, by household income quintile groups



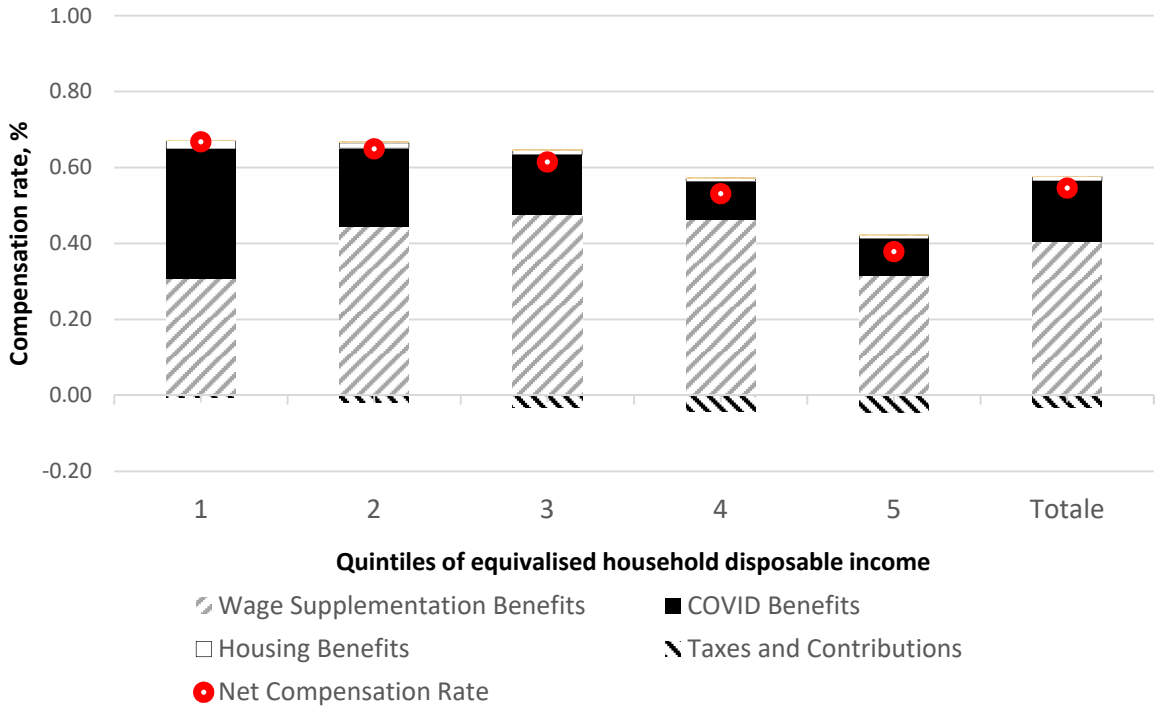
Notes: Net Replacement Rate is the ratio of household disposable income after and before the earning shock. "COVID Benefit" include newly discretionary policies such as lump sum transfers to self-employed and employees; "Housing Benefits" include the amount equivalent to the mortgage instalment for the main residence; "Other Benefits" include pension and invalidity benefits, minimum income schemes, family benefits; "Taxes and Contributions" include personal income tax, employee social insurance contributions and other direct taxes.
Source: EUROMOD I2.0+.

To focus on the income protection offered by public support, we adopt the Compensation Rate. It shows that the average net public contribution to the disposable income as proportion of the net earning lost due to the lockdown is around 55% with a decreasing pattern along the income distribution (Figure 3).

Most public support is channelled through the Wage Supplementation Benefits (bar with forward sloping grey lines) only slightly reduced by the progressive income tax (bar with backward sloping black lines) payable on these benefits. The COVID Benefits makes up the largest share of public support at the bottom of the distribution but represent a non negligible compensation for those in the upper part of the distribution as well.

Families in the first quintile group benefit relatively more from COVID Benefits because individuals entitled to these lump-sum transfers (i.e. self-employed and occasional workers) are more represented in this group with original income relatively low with respect to the 600 € provided by the lump-sum transfer. The Compensation Rate decreases with income because the Wage Supplementation Schemes represent a decreasing income replacement, given that it is cap at 1,130 euro.

Figure 3. Decomposition (by income sources) of average Compensation Rates for those affected by the lockdown, by household income quintile groups



Note. See Figure 1. Quintile groups based on disposable income before becoming unemployed. The lump sum of 100€ to the employees is not included in the Compensation Rate because it is given to employees who are not subject to a reduction in their original income. In order to avoid the impact of outliers, the sample is restricted to employees with a Compensation rate between 0 and 1 and to self-employed with income larger than 50€ per month. The Figures reports individual averages which are not strictly comparable with numbers behind Figure 1 which are aggregates at quintile levels. Source: EUROMOD version I2.0+.

5.2. Absolute resilience

The extent to which the tax-benefit instruments allow those affected by the shutdown to avoid falling below a given level of income depends on the generosity of the system, entitlement to receive Wage Supplementation Benefits and COVID Benefits, the income position of the individuals before losing their earnings and their household circumstances.

Table 6 shows the poverty rates, for different groups of the population, in three different scenarios: before the shutdown due to the COVID-19 pandemic, after the shut-down without considering the compensation policies implemented by the government and after the shut-down considering the discretionary policies introduced by the government. The poverty line is always constant as in the scenario before the shutdown.

Focusing on the workers active in sectors subject to the shutdown, the share of those at risk of poverty before the shock is around 13%. The impact of the shutdown alone is disruptive with the poverty rate that would have reached 68% of workers without any compensation measure. The policies implemented by the government are able to limit such an impact, limiting the poverty rate at 28%.

The individuals living in one-earner families are, as expected, more exposed to poverty risk: 22% are poor already before the COVID-19 pandemic, 80% would have been in a poverty

status without compensation measures and 44% are below the poverty threshold with thhee discretionary policies in operation

Even extending the analysis to the overall population and considering the compensation measures implemented by the government, it is clear the breakthrough impact of the pandemic on the poverty status with an increase in the poverty rate of more than 8 percentage points, and of more than 13 percentage points when we focus children.

Table 6. Poverty rates before and after the COVID-19 pandemic

	Before COVID-19	Shut-down, without compensation policies	Shut-down, with compensation policies
Workers in sectors subject to shut down	12.53%	67.97%	28.15%
Workers in sectors subject to shut-down and living in one-earner families	22.13%	80.49%	43.71%
Overall population	19.07%	38.41%	27.28%
Children	23.27%	49.63%	36.34%

Notes: The poverty threshold is fixed at 60% of baseline median household disposable equivalised income. Poverty rates based on household equivalised disposable income. Source: EUROMOD version I2.0+

6. Conclusions

We have analysed the extent to which the Italian tax-benefit system provides a support of income for those affected by the economic shut-down at the onset of the COVID-19 pandemic. Our paper offers a scenario rather than a forecast and it provides a reference point against which one can evaluate the development of the economic situation and the new policies that will be implemented.

In order to assess the impact of the existing and newly designed benefits on household income, counterfactual scenarios are simulated by using EUROMOD, the EU-wide microsimulation model, integrated with information from the activity sectors subject to the economic shut-down.

Our analysis relates to the potential economic effects of the first month of the COVID-19 pandemic and abstracts from any possibility of income and consumption smoothing that individuals can exploit over a longer period of time. Individual preferences for consumption smoothing lead, for instance, to a decrease in current consumption in the presence of economic insecurity. Consequently, the overall effects of the crisis would be exacerbated if the government does not provide immediately an income stabilisation for those who actually experience earning loss with potential future detrimental effects on the aggregated demand.

Based on our scenario, one can expect a loss of market income of individuals larger than 30%, only partially compensated by new policy measures which tend to guarantee to a larger extent the income of those at the bottom of the distribution. Nevertheless, it is expected an increase in the overall inequality and poverty risk of 15 percentage points among individuals affected by the shut-down and more than 8 percentage point considering the overall population.

It is clear that the effects of the COVID-19 are asymmetric, particularly relevant from an economic perspective for some families and less for others, even considering the compensation measures implemented by the government. It is crucial to take into account such unequal distribution of the shock if the economic consequences are expected to long last.

From a policy perspective, the first month of the COVID-19 pandemic has been characterised by a very limited role of the automatic stabilizers embedded in the tax-benefit system because the most important ones (i.e. Minimum guaranteed income - RdC, Family allowances – ANF and in-work bonus – Bonus IRPEF) depend on incomes (and asset) of the previous year and do not react to sudden loss of earnings experienced in March 2020. Moreover, some of the measures, as the lump sum transfer of 600€ to self-employed, although imposed by the emergency situation, do not seem to be well designed in terms of size and design providing a transfer equal to all those entitled but preventing the full coverage (domestic workers are excluded).

At the time of writing the Italian government has decided that some limited sectors (i.e. bookshops, baby clothes shops, …) subject to the shut-down could reopen since the mid of April 2020 and it is adopting a new Decree Law with new and more generous compensation measures including a new "emergency income" which should help to protect individuals for income losses.

In order to avoid an increase in inequality and poverty two national think-tanks, Forum Diseguaglianze Diversità and ASviS, suggest to implement two extraordinary and temporary instruments: i) the so called *Sostegno di Emergenza per il Lavoro Autonomo* (SEA – Emergency sustain of self-employment) - an income support that takes into account the economic conditions of the household of the self-employed who loses her job – and ii) *Reddito di Cittadinanza per l'Emergenza* (REM - Emergency Citizenship Income) – a last safety net for those not covered by other instruments based on the design of the Citizenship Income (Forum Diseguagliane Diversità and ASviS, 2020). These measures would allow the country to have a systematic set of instruments to support incomes in the short term and allow the government to focus on the actions needed for the medium and long term economic recovery

In general terms, our analysis has demonstrated the importance of the income of other household members in determining the economic resilience of those affected by the shut-down. The sharing of risks within the household can be seen in general terms as a complement to the insurance function of the Welfare State. However, as is usual in distributive analysis, we have assumed complete income pooling within the household. The possibility that incomes are not in fact pooled serves to remind us of the non-equivalence of income received as Wage Supplementation Schemes as an individual entitlement on the one hand, and income support schemes, usually assessed on the economic situation of the family as a whole, on the other.

We plan to extend our analysis in two ways. First, we will follow the evolution of the COVID-19 pandemic in Italy tracing the evolution of the shut-down effects on the labour market and the monitoring the compensation effect on household incomes offered by the policy measures.

Second, we will extend our analysis to the most important European economies to capture the effects of the COVID-19 asymmetric shock on heterogeneous European welfare systems. In a cross country perspective, such evidence will raise normative issues on the protection level that the tax-benefit system should ensure to the population.

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