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Suicide and the economy: a regional analysis of italy

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ABSTRACT

This note investigates the empirical pattern of suicides across Italy over the last 15 years. Typically, a country shares similar basic cultural and social macro-features. Yet in Italy there are marked variations across the regions such that it provides a useful setting to examine the economic factors that influence suicidality. The results align with some earlier work positing an N-shaped Kuznets curve linking income and the suicide rate. Female participation in the labour market emerges as a robust explanatory factor for male and female suicide rates.

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KEYWORDS
Suicide; Income; gender; labour market participation

1. Introduction

Economic factors are far from being the sole (or the main) reasons for suicide. It is more likely that in many or most cases, economic conditions have nothing to do with suicidal behaviours. However, the potential importance of economic factors, at both individual and aggregate level, on suicide behaviours is recognized by a large body of social and even epidemiological studies (see, e.g., the review by Mann & Metts, 2017). From an economic analysis perspective, the interest of economists in suicide patterns is also motivated by the fact that suicidal rate is an indicator for life satisfaction, and the economic factors related to suicide can be interpreted as economic pillars of unhappiness. The results of different studies on the economic determinants of suicides are in some cases unanimous and in other cases under disputation.

The present investigation takes a regional perspective, considering a panel of the Italian regions observed over the period 2003–15 as the case study. The regions of a country share similar basic cultural and macro-social features. At the same time, the economic situation in Italy is markedly different across regions. This is a good framework to investigate the influence of macroeconomic factors on suicidal behaviour.

The data at hand confirm some well-known facts; first of all, the largely different suicide rate between males and females (see, e.g., Travis, 1990). The reasons of such gender asymmetry are discussed by several studies in sociological, anthropological and economic literature (see the review in Stack, 2000, and the recent contribution of Botha & Nguyen, 2022). The present study does not deal with the *reasons* of gender asymmetry,

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but this asymmetry is taken as a fact, and male and female suicidal rates are analysed separately. As a matter of fact, the determinant factors emerge to be different as well.

The present analysis specifically aims to answer two questions. (1) Is income relevant in shaping suicide? That is, are economic crises a reason for suicide? (2) Is unemployment relevant in suicidal behaviour? i.e., more in general, is the dynamics of the job market an explanatory factor for suicide patterns? Available literature provides mixed answers to both questions, and also the present analysis will provide mixed evidence.

As far as income concerns, a number of analyses document a significant link with suicide: a decline in the level (or even in the growth rate) of real output leads to an increase in suicide rates – see, among others, the recent contributions of Agrrawal et al. (2017) for the US, and dos Santos et al. (2016) for Portugal. Other studies show a less clear influence of income dynamics on suicidal behaviour – see, e.g., Abdou et al. (2020) for the US, Gonzalez & Quast (2011) for Mexico, and especially Okada & Samreth 2013) for a panel of OECD countries. According to this present study, economic recessions do not emerge to have a significant link with suicide, and income dynamics is not a robust determinant of suicide, if attention is limited to linear relation. However, some elements support a *N*-shaped suicidal Kuznets curve, linking income level and suicide, as recently found, at the world level, by Antonakakis & Collins (2018); see also Collins et al. (2020).

As far as job conditions and suicide are concerned, the available literature – starting from the seminal theoretical contribution of Hamermesh & Soss (1974) – suggests that robust links hold. Broadly speaking, an increase in unemployment rates leads to an increase in suicide rates (Agrrawal et al., 2017; Andrés & Halicioglu, 2010, 2011; Andrés et al., 2011; Antonakakis & Collins, 2014). However, a closer look suggests that male and female suicidal rate are affected by job market conditions in different way. For instance, in a recent study concerning the case of Australia, Botha & Nguyen (2022) find that unemployment has asymmetric effects on male and female suicides: an increase of unemployment rate increases male suicides and has no effect on female suicides, while a decrease of unemployment rate entails a lower female suicide rate and has no effect on male suicides. Mattei & Pistoresi (2019) deal with the Italian case, and find that long-term unemployment impacts on suicide, but social policies are able to mitigate the impact.

The present investigation resorts to regional data for the Italian case, and finds that the unemployment rate is *not* related to suicide; rather, labour market *participation* appears to be a more robust explanatory factor, and specifically the female participation rate emerges to affect both male and female suicide rates, with signs worth interpreting.

Section 2 presents the data; Sections 3 deals with methodological aspects; Section 4 presents the results; Section 5 provides some comments and concluding comments.

2. Data

This analysis considers a dataset covering the 20 Italian regions over the period 2003–15. Table 1 reports the list of the regions, and some basic statistics for suicide rates, and for some macroeconomic variables under consideration. All variables are provided by ISTAT, the Italian Statistics Institute (and they are available from the Author, on request, in a single data-file).

The suicide rate (suicide per 10,000 inhabitants) is denoted by $SUIC_{Male}$ and $SUIC_{Female}$ for males and females, respectively. It is interesting to report that the average

Table 1. Regions and basic statistics.

	$SUIC_{Male}$		$SUIC_{Female}$		INC^{RPC}	*UNEMP (mean)*		*PARTIC (mean)*	
Region	Mean	min; max	Mean	min; max	*(mean)*	Male	Female	Male	Female
1. Piemonte	1.43	1.29; 1.60	0.42	0; 1.37	29.14	6.25	8.13	76.61	60.89
2. Valdaosta	1.93	1.29; 2.71	0.63	0; 1.37	35.27	4.87	5.44	77.43	63.55
3. Lombardia	1.03	0.91;1.13	0.31	0.28; 0.36	35.47	4.65	6.48	78.27	60.19
4. Trentino-AA	1.46	1.22; 1.78	0.39	0.15; 055	35.83	3.08	4.72	79.09	62.36
5. Veneto	1.15	1.00; 1.38	0.33	0.24; 0.39	30.52	3.81	7.07	78.28	57.99
6. Friuli-VG	1.26	0.95: 1.54	0.42	0.27; 0.54	28.86	4.34	6.92	75.93	59.00
7. Liguria	0.77	0.59; 0.89	0.24	0.16; 0.31	30.09	5.71	8.43	74.99	58.63
8. Emilia-R	1.37	1.20; 1.53	0.43	0.38; 0.55	32.98	4.22	6.31	78.99	64.95
9. Toscana	1.19	0.99; 1.34	0.30	0.21; 0.38	29.08	5.03	8.23	77.07	60.33
10. Umbria	1.44	1.07; 1.57	0.36	0.20; 0.48	25.17	5.57	9.32	75.69	59.14
11. Marche	1.33	1.14; 1.69	0.34	0.26; 0.47	26.10	5.51	8.28	76.43	59.58
12. Lazio	0.78	0.68; 0.95	0.23	0.17; 0.31	33.59	7.95	10.85	75.44	54.86
13. Abruzzo§	1.15	0.90; 1.45	0.32	0.21; 0.44	23.58	7.09	11.50	73.66	50.51
14. Molise§	0.97	0.39; 1.77	0.25	0.12; 0.37	20.73	9.57	13.31	69.90	45.07
15. Campania§	0.60	0.49; 0.67	0.17	0.14; 0.23	17.91	13.77	20.12	65.46	34.70
16. Puglia§	0.79	0.67; 0.98	0.20	0.14; 0.25	17.34	12.82	19.28	69.17	36.61
17. Basilicata§	1.15	0.87; 1.59	0.28	0.10; 0.57	19.35	10.73	15.76	69.27	41.70
18. Calabria§	0.84	0.74; 0.96	0.21	0.09; 0.27	16.79	14.10	18.52	64.63	37.42
19. Sicilia§	0.93	0.82;1.08	0.21	0.18; 0.25	17.79	14.90	20.37	67.22	35.73
20. Sardegna§	1.73	1.51; 2.04	0.32	0.19; 0.47	20.11	12.51	16.51	71.09	47.92

Note: § denotes the Southern and island regions (8 out of 20) that constitute the so-called "Mezzogiorno".

datum for suicide over the whole population in the timespan under consideration is 0.729; the male rate is 1.164 while the female rate is 0.318. This means that the male suicidal rate is 3.7 times larger than the female rate – substantially in line with what happens in other developed countries (e.g., in the US the ratio is around 4). While this ratio has been decreasing in the Fifties-Seventies of the 20th century in most countries – due to an increase in the female suicide rate–, it has been increasing in the most recent decades. This tendency to increase is also present in the data at hand – see Figure 1 that reports the ratio of male to female suicidal rate over time, averaged among regions.

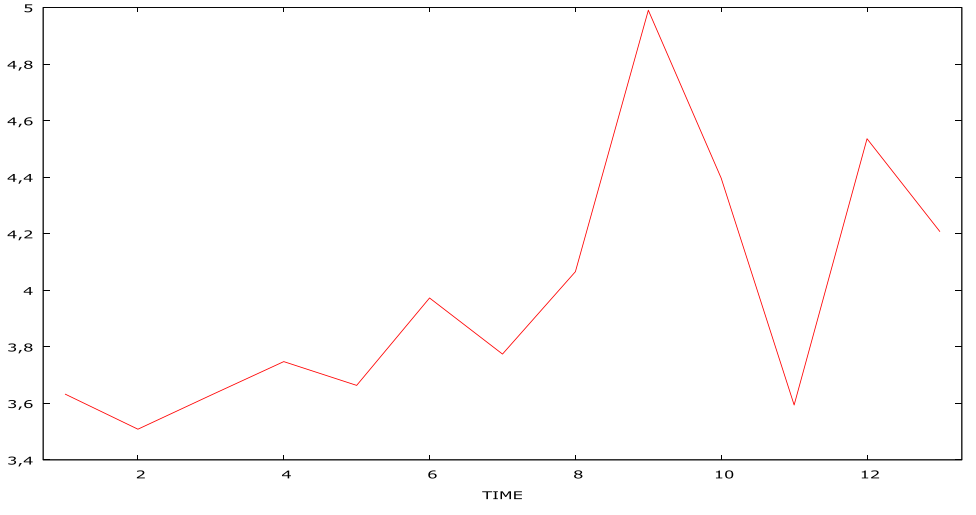

Figure 1. Ratio male to female suicidal rate over time (average across regions).

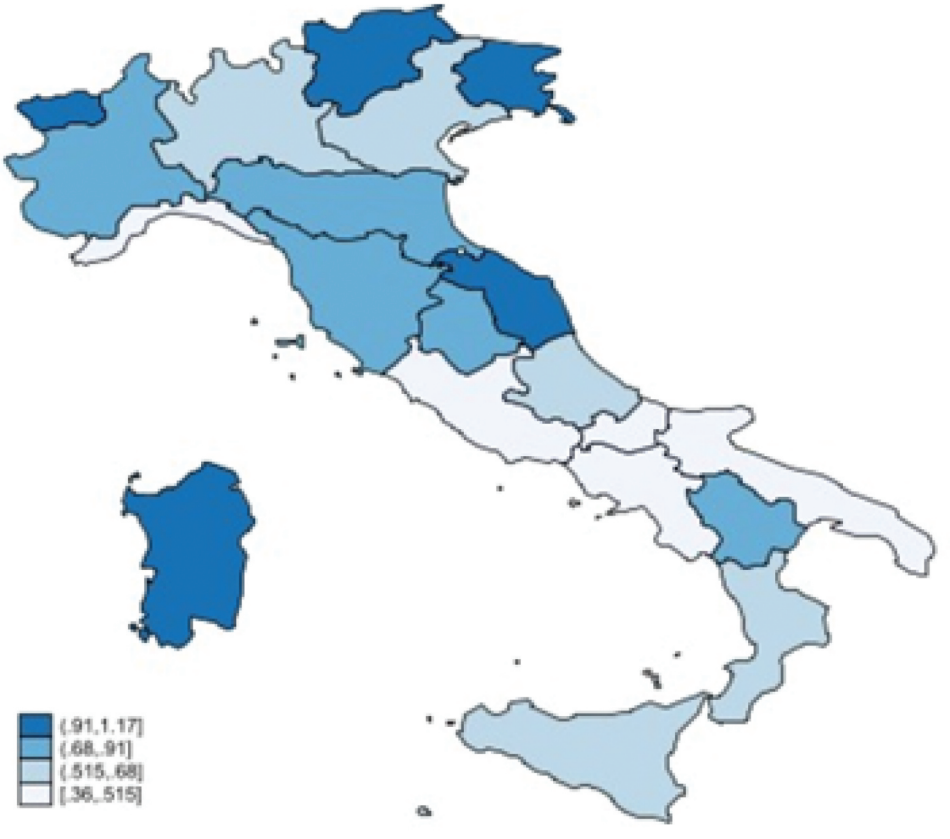

Figure 2. Suicide rate by regions (2015).

Income is measured by per-capita regional GDP in real terms (all data are deflated through the national Consumer Price Index; thousand Euro, 2005 basis), and denoted by $INCOME_{RPC}$. Notice that the dualistic articulation of Italy is clear: all Southern regions (the so-called "Mezzogiorno", including Sicilia and Sardinia) show average income levels less than 25,000 Euro, while all Central and Northern regions are above this threshold. Such a dualistic picture also emerges for unemployment rate (*UNEMP*) and participation rate (*PARTIC*). Interestingly, a dualistic situation does *not* emerge in reference to suicide rates: even if the average values in Northern regions may appear to be higher than in the Mezzogiorno, formal tests do not reject the null of mean equality, and – just to give a rough and impressive piece of information – the two regions with the highest suicide rates are Valdaosta and Sardinia (the former is located in the North, the latter in the Mezzogiorno) and, symmetrically, the two regions with the lowest rates are Campania and Liguria (the former in the Mezzogiorno and the latter in the North). A map of suicide rate by regions is provided by Figure 2.

3. Methodology

A panel of 13 annual data (2003–15) for 20 subjects is considered in the present study. The subjects of the panel, that is, the 20 Italian regions, are not the outcome of casual

draw; they differ as far as individual fixed features, constant over time, are concerned – let us think, e.g., of the surface, and also to demographic characteristics which are stable over time – so that the fixed-effect (FE) estimator is the appropriate one, beyond any statistical tests (by the way, all the statistical tests do support that individual constant terms are significant, different across regions, and generally correlated with the included explanatory factors, in all regressions that follow). However, in dynamic specification regression, the FE estimator is known to be inconsistent and biased, especially in the presence of a short time-span dimension (Arellano & Bond, 1991; Blundel & Bond, 1998). Thus, in the case of dynamic specification, the present analysis will resort to the "System GMM" estimator, under the two-step procedure, which is more efficient and robust to heteroskedasticity and autocorrelation within the panel.

Formally, the regression equations under consideration are as follows. The (initial) static specification is:

$$y_{i,t} = \alpha_i + \sum\nolimits_{j=1}^{M} \beta_j X_{i,t}^j + \varepsilon_{i,t} \tag{1}$$

where the dependent variable $y_{i,t}$ is the suicidal rate in region i at time t (with $i \in [1, 20]$ and $t \in [2003, 2015]$), separately for males and females in different regressions; α_i is the fixed effect (i.e., the constant term, specific for each region); X is the vector of M explanatory variables including income and its powers, unemployment rates, participation rates, school rates (as measured by the percentage of adult population with secondary education or more), divorce rates – all variables moving both across regions and over time; $\varepsilon_{i,t}$ is the error term assumed to be white noise).

The dynamic specification is:

$$y_{i,t} = \alpha_i + \gamma \cdot y_{i,t-1} + \sum\nolimits_{j=1}^{M} \beta_j X_{i,t}^j + \varepsilon_{i,t}\,; \tag{2}$$

where a 2nd order autoregressive process is considered for the error term, that is, $\varepsilon_{i,t} = \varpi_1 \varepsilon_{i,t-1} + \varpi_2 \varepsilon_{i,t-2} + \eta_{i,t}$, with $\eta_{i,t}$ as white noise (then, tests for $\varpi_1 = 0, \varpi_2 = 0$ are performed).

4. Econometric evidence

Results from static specification are reported in Table 2. Income, as measured by the GDP in real per-capita terms, is statistically significant. However, the relation between suicidality and GDP is not linear. Interestingly, the cubic relationship (i.e., N-shaped functional form), already found by Antonakakis & Collins (2018) for some segments of population in a large panel of world countries, is confirmed in the case of the Italian regions, for both males and females. I propose here an interpretation of the cubic relationship, already suggested by previous analyses: at the early stage of development, the economic growth induces concern, apprehension and deep discomfort in people deprived from the hope related to growth; in an intermediate phase, the optimistic perspective and a wide diffusion of growth opportunities prevail, and economic growth is associated with reducing suicidal rates; in a mature phase of growth, dis-satisfaction with reached income levels and restlessness feed a positive nexus between growth and suicides again. However, different or complementary explanations are possible: though conjectural, one can

imagine that wealthier areas tend to have greater life expectancy, and the rate of suicide is larger among elderly people, so beyond a given income threshold, wealthier areas could have higher suicide rates, because of a population composition effect.

As far as the variables related to job market are concerned, both the participation rate and the unemployment rate are significant in the case of male suicidal rate, with the expected signs: larger unemployment favours suicide, while a larger participation rate tends to limit male suicidal rate (see model [M1] in Table 2). No relationships with participation and/or unemployment emerge in the case of females (Model [F1] in Table 2). This outcome is not in conflict with the results of previous investigations concerning different countries and times: in general, it is well known that the economic determinants of suicides are clearer in the case of male suicide than female suicide. If the statistically insignificant regressors are omitted, the final specification reported in column [F2] obtains. Moreover, the unemployment rate and the participation rate of the *other* gender are not significant, in the case of both male and female suicidal rates, and their inclusion or omission do not modify the coefficients of other explanatory factors.

The tests on statistical significance, for a set of variables which have proved to be significant in previous analyses referred to different case-studies, are evaluated. In particular, the divorce rate, the secondary school rate, and a dummy variable capturing years of recession (as defined by a contraction of GDP) are considered.

The dummy variable for economic recession is insignificant, for both male and female suicide rate, irrespective of whether GDP is included or not in regression specification, and irrespective of linear, quadratic or cubic relation under consideration (the test of variable addition, with reference to the dummy variable for years of economic recession, provides $F_{1,234} = 1.27$ with $p = 0.26$, and $F_{1,234} = 0.19$ with $p = 0.66$, for specification [M1] and [F1], respectively). Moreover, there is no structural break in the relation of suicide rates with GDP, depending on whether the year is of growth or recession (the appropriate test rejects the structural break for the GDP effect on suicide rate). Thus, while there is an influence of economic conditions upon suicide, one can conclude that there is *not* an immediate sensitivity of suicide to economic recessions.

The school rate variable and the divorce rate are significant for males, but not for females. A higher secondary school rate associates with a higher male suicidal rate; a higher divorce rate associates with a lower male suicidal rate (this holds for both contemporary and lagged divorce rates).

Model [M2] and [F2] in Table 2 can be considered as the best specification in a static regression analysis framework. However, all previous analyses in economic literature, as well as the data in the present investigation, show that suicide rate are auto-correlated over time. Such a statistical property could be related to the well-known "imitation theorem" that points out that suicide stories, reported by the media, trigger copycat suicides (Stack, 1990).

Thus, the analysis proceeds, by considering a more appropriate dynamic specification, in which the first lag of the dependent variable is included among the regressors. In this case, in order to overcome the biasedness and inconsistency of the estimates in the presence of fixed effects, the two-step System-GMM estimator

Table 2. Suicide determinants: static specification; dynamic specification.

	$SUIC_{Male}$		$SUIC_{Female}$	
Dept. var.:	Model [M1]	Model [M2]	Model [F1]	Model [F2]
Fixed effects	Yes	Yes	Yes	Yes
GDP	0.924***	0.936***	0.292**	0,271**
	(3.49)	(3.39)	(2.23)	(2.13)
GDP_squared (/10)	−0.328***	−0.332***	−0.115**	−0,108**
	(−3.46)	(−3.38)	(−2.27)	(−2.17)
GDP_cube (/100)	0.039***	0.039***	0.014**	0,0143**
	(3.40)	(3.324)	(2.26)	(2.17)
$UNEMP_{male}$	0.021**	0.022**		
	(2.30)	(2.22)		
$UNEMP_{female}$			0.003	
			(0.70)	
$PART_{male}$	−0.024**	−0.025**		
	(−2.32)	(−2.04)		
$PART_{female}$			−0.004	
			(−0.72)	
Sec School rate		0.012**		
		(2.54)		
Divorce rate		−0.189**		
		(−2.53)		
R2	0.799	0.801	0.471	0.469
F test on diff individual eff	$F_{19,235} = 31.48$ [$p = 0.000$]	$F_{19,233} = 26.90$ [$p = 0.000$]	$F_{19,235} = 4.18$ [$p = 0.000$]	$F_{19,237} = 6.22$ [$p = 0.000$]

Note: *t*-stat in parenthesis; ***,**,* denote statistical significance at the 1%, 5%,10% respectively. *F* test is on the difference of individual intercepts; *p*-values in squared brackets.

(with the inclusion of equations in level) is adopted.[1] In the language of GMM, with reference to regression equation (2), the relations $E\left(\Delta\varepsilon_{i,t} \cdot y_{i,t-k}\right) = 0, k > 1$, are used as orthogonality conditions. The "from the general to the particular" procedure is followed, to select the appropriate regression specification. Beyond the first lag of the dependent variable, the explanatory variables considered in the general specification include: income (in level, squared and cubic terms), a dummy for recession years, the unemployment rate and the participation rate (both rates for both males and females), the secondary school enrolment rate, and the divorce rate (number of divorces per 10,000 inhabitants). I then omit, one by one, the variable with the highest *p*-value. Initial and final specifications, for the male and the female suicide rate are reported in Table 3.

Admittedly, in spite of the fixed effects and the lagged dependent variable among the regressors, unobservable heterogeneity – let us think, e.g., of mental-health related variables – might remain not controlled and might simultaneously shift participation and the suicide rate. Thus, endogeneity could be an issue. However, it is worth noticing that the macroeconomic variables, here used as the instruments (such as income and labour market variables), are safely assumed to be exogenous with respect to suicide, by the whole body of available literature on suicide.[2] Moreover, the over-identification restriction Sargan test always support the considered specification.

[1]The software Gretl (DPANEL – GMM SYS procedure) is used.

[2]Not surprisingly, formal tests, e.g., *à la* Hausman, support such an assumption in all cases (that is, in all regressions) of the present study; for instance, the Hausman test concerning the exogeneity of $PART_{Female}$ (assumed to be determined by its lagged value) gives $F_{1,217} = 0.81$ ($p = 0.37$) in model [M4]; and $F_{1,217} = 3.10$ ($p = 0.08$) in model [F4].

Income effects are not statistically significant, after the lagged dependent variable is considered among the regressors. Unemployment rates are not significant. Differently, participation rate emerges to matter; in particular the female participation rate is significant, for both male and female suicide rate. However, the sign is the opposite as expected: the higher the female participation rate, the higher the suicide rate, for both males and females. Divorce rate is significant only on the male suicidal rate, with a negative sign: the larger the divorce rate, the lower the male suicidal rate. This result – which also emerges from the static regressions reported in Table 2 – might not be totally surprising. The influence of divorce on suicide is hard to interpret a priori: while divorce is traumatic and signals a failure, it could be the best option for both spouses (or at least for one of them) if they are in a bad relationship. So in societies where there is no social stigma on divorce, people may have more chances to start anew after divorce, and this could explain the negative sign of the link between divorce and suicide.

In general, the inclusion of the autoregressive term of suicidal rate *reduces* – but it does not delete – the influence of economic factors in explaining suicide pattern, and specifically the female participation rate remains positive and significant. The tests on variable omission – referred, one by one, to any single economic variable under consideration, excluded from [M4] and [F4] specifications – lead to confirm the appropriateness of omission.

5. Comments, discussion and concluding remarks

The interesting point, emerging from this analysis, is the effect of female participation rate, which appears to be suicide-enhancing, for both males and females. Is there any rational explanation behind such a conclusion, which could be judged as a fruit of patriarchy legacy?

Participation in the labour market is a variable absorbing not only economic factors, but also social and cultural values. Some possible interpretations can be offered and some others can be excluded, on the basis of the aggregate data at hand.

First of all, I would exclude that the link has to do with education, even if education and participation rates appear to have positive correlation: the simple correlation between secondary school rate in adult population and participation rate is 0.26 for males and 0.33 for females in the databank under scrutiny. However, the simple correlation between education (as measured by the secondary school rate under present consideration) and suicide rate, for both males and females, is not significant. Moreover, in multiple regression analysis, education shows unstable signs and significance, conditional on participation rate. Thus, one cannot find robust evidence permitting to provide a sensible explanation of the link between suicide and female participation rate, connected with the role of education.

One cannot exclude that the link between suicidal rates and female work participation has to do with difficulties in work-life-balance, especially in the case of Italy where the welfare services supporting families and childcare are undersupplied. In this perspective, though provocative, one could argue that a larger participation of women to the job market, at least in Italy, entails family instability and stress, leading to higher suicide rates for both males and females.

Table 3. Suicide determinants: dynamic specification; system GMM estimator.

	$SUIC_{Male}$		$SUIC_{Female}$	
Dept. var.:	Model [M3]	Model [M4]	Model [F3]	Model [F4]
Fixed effects	Yes	Yes	Yes	Yes
Lagged Dept. Variable	0.48***	0.30***	−0.253*	−0.236**
	(2.64)	(2.88)	(−1.87)	(−2.25)
GDP	−0.065		−0.001	
	(−1.40)		(−0.04)	
GDP_squared	0.007		−0.0007	
(/10)	(0.94)		(−0.18)	
Recession	−0.031		−0.002	
	(−1.08)		(−0.29)	
$UNEMP_{male}$	0.015		0.002	
	(1.67)*		(0.58)	
$UNEMP_{female}$	−0.027**		−0.008*	
	(−2.93)		(−1.72)	
$PART_{male}$	0.021		0.00601	
	(1.44)		(0.92)	
$PART_{female}$	0.016***	0.019***	0.007***	0.007***
	(2.58)	(8.93)	(3.10)	(7.74)
Sec School rate	−0.002		−0.003*	
	(−0.27)		(−1.86)	
Divorce rate	−0.239***	−0.204***	−0.043	
	(−3.68)	(−2.98)	(−1.08)	
AR(1), z	z=−2.575***	z =−1.980**	z=−1.047	z=−1.103
[p-value]	[0.010]	[0.048]	[0.295]	[0.270]
AR(2), z	z = 0.022	z= −0.364	z = 0.769	z = 0.821
[p-value]	[0.982]	[0.716]	[0.441]	[0.412]
Sargan over-identif test, χ^2 [p-value]	χ^2_{76} = 9.55	χ^2_{76} = 17.44	χ^2_{76} = 13.07	χ^2_{76} = 19.26
	[1.00]	[1.00]	[1.00]	[1.00]

Note: two step GMM, with equations in level is considered. z-stat in parenthesis; p-value in squared brackets. ***/**/* denote statistical significance at the 1/5/10% level, respectively.

Another explanation could have to do with the work-related stress, which – according to some analyses – is larger for females than males. For instance, De Sio et al. (2018, p. 4), analysing data from US, provide evidence that "female workers, compared to male workers, are more vulnerable to psychosocial risks, regardless of contract typology, and this increases their susceptibility to develop work related stress". Interestingly, De Sio et al. (2018) associate the work-related stress – larger for women than men – to the uncertainty entailed by economic crisis. Again, Aydin et al. (2012) document cases of lower general job satisfaction for women than men. A possible explanation could rest on the mismatch between personal skills and job duties, which could be larger for females than males. However, available analyses do not show unanimously that this is the case: some recent analyses show the opposite, at least for the OECD countries. For instance, Adalet McGowan & Andrews (2015, p. 20) document that "Across OECD countries, females are less likely to be mismatched in terms of skills [. . .]; this is mainly driven by the fact that females are less likely to be over-skilled [. . .], while the relationship between gender and under-skilling is not significant". Similar results are found by Quintini (2011). These pieces of evidence are contrary to the commonplace that that women are more likely to be over-skilled due to family constraints or to the wish to improve their work-life balance, but they are not at odds with the finding that females are generally more prone to work-related stress than males. More in general, a recent investigation of Blanchflower and Bryson (2022) provides evidence supporting the conclusion that women are unhappier than men – something which of course does not match the pattern

that suicide are higher among men! Again, Case and Deaton (2015) do not find any clear empirical relation between suicide and self-reported wellbeing. For sure, these links are debatable, and it is hard to draw clear conclusions, here, regarding the link between female work participation rate, work-related stress, and aggregate suicidal rates.

Other factors, of different nature, can be also considered. Higher participation rates associate with lower fertility rates, and the absence of family ties (including the absence of children) and loneliness are known to be linked to suicidal behaviours (see, e.g., Stravynski & Boyer, 2001, among many others). However, this explanation would be more appropriate for the long-run, than for the short-run evidence under analysis in this study.

More convincingly – also considering the timespan under scrutiny, which is short and characterized by repeated economic crises- one could point out that a segment of the female labour force has entered the labour market, to provide additional economic support to the household in response to situations of economic crisis. From this perspective, the suicidal behaviour (of both males and females) is an effect of the economic stress jointly with the necessity for females to enter the job market, with the latter phenomenon representing a possible determinant of suicidal behaviour.

Clearly, all the considerations above are tentative, partial, and in some cases openly provocative. Admittedly, the present study has some limitations, concerning the empirical approach and the findings. Basically, the analysis has proposed a reduced-form model, and potential endogeneity cannot be excluded; a structural model would be suitable for studying different mechanism and the appropriate policy measures. However, it is no exaggeration to say that the link between female participation rate and suicide rates is a strong piece of evidence in the present analysis of Italy with a regional perspective. Thus, further investigation to put light on this relation and its robustness, and to assess whether the relation also emerges for other countries and time periods, is worth to be considered in future analyses.

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