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Welfare stigma with decreasing employability

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Abstract

We analyze the effects of income support on unemployment and welfare dynamics when stigma is attached to welfare provision. Stigma has been modeled in the literature as a cost of welfare participation; in this paper we analyze the effect of income support on unemployment and welfare dynamics by assuming that welfare stigma also leads to progressive loss of employability. Unemployment and welfare participation are studied under the cross-sectional and dynamic perspectives. While traditional models predict lower unemployment rates with welfare stigma, in our model unemployment rates follow a non-monotonic pattern: as a consequence, in addition to reducing take-up rates, welfare stigma may also contribute to increase unemployment.

Keywords

job-search models, welfare dependence, stigma, agent-based modeling, forecasting ability

1. Introduction

Goal of welfare programs is to alleviate poverty by providing income support to those who are in need. Stigma is acknowledged as one of the determinants of welfare participation (Hernanz *et al* 2004) and there is wide evidence that it negatively affects take-up rates. Keeping stigma low is one of the aims of program design as it is recognized that welfare policies will have a limited impact if a significant share of those who are entitled for the benefit do not claim it.

Yet, there is ample consensus that transfer programs reduce work effort. The effect of income support policies has been the object of extensive theoretical (Rogerson *et al*, 2005) and empirical research (Moffitt 1992; Moffitt, 2002; Blank 2002). The focus is on work disincentives: if the benefit is high enough with respect to wages, individuals choose welfare and stay out of the labor market. Hence, the concern is that anti-poverty programs may indirectly foster unemployment and poverty, by triggering the ‘welfare trap’.

In this respect, welfare stigma may exert a positive role. Starting from the seminal work of Moffitt (1983) traditional models characterize stigma as a fixed cost of being on welfare and predict that stigma lowers take-up rates but reduces unemployment, contributing to offset the negative consequences of income support programs. Moreover stigma may help preventing moral hazard, and may serve to reduce the number of undeserving claimants on welfare (Besley and Coate, 1992).

In this paper we analyze the effect of income support on unemployment and welfare dynamics when social disqualification is attached to welfare provision by assuming that, in addition to affecting the utility of being on welfare, stigma also yields to progressive reduction of the recipient’s employment probability. The motivation is that stigma might entail psychological mechanisms such as loss of self-confidence or nourish unfavorable attitudes of potential employers.

Assuming we are dealing with poorly endowed individuals, with low skills and job opportunities, we develop a partial equilibrium job-search model, where labor market features are taken as given. The unemployed choose whether to search for a job and whether to be on welfare. In this setting, it is difficult to derive analytical solutions. For this reason we study how welfare stigma affects welfare take-up rates, unemployment and welfare participation rates and unemployment and welfare spell length by means of an agent-based simulation, which is analyzed in the stationary state.

Further, we relax the hypothesis of perfect forecasting ability, which we find particularly at odds with our focus on weak subjects: individuals do not have an infinite time horizon as in standard models, but assess the value of their alternative options by looking ahead for a finite

number of periods. We analyze the behavior of the relevant economic outcomes as time horizon increases. Moreover, individuals may not be able to anticipate the psychological effects of being on welfare giving rise to loss of employability; for this reason we let the unemployed be able or not to forecast such decay.

The most relevant finding is that stigma may have no positive drawbacks: while traditional models predict lower unemployment rates with welfare stigma, in our model unemployment rates often *rise* as stigma grows stronger.

This result might appear trivial, at first sight, given our assumption that stigma negatively affects employment prospects of welfare participants. However, individuals who anticipate the loss of employability might defer welfare entry, and thus search more intensively. In other words, the employability component of stigma might work as an additional deterrent, on top of the utility component, and thus reinforce the standard result. The fact that this is not the case is far from obvious. Moreover, even if individuals do not anticipate the future loss of employability, the composition of the two effects of stigma – the utility component increasing employment and the employability component increasing unemployment, is *a priori* undetermined.

Few data are available on welfare stigma. Some evidence on the strength of stigma can be found in the World Values Survey, which provides harmonized questions on values and attitudes for an extensive set of countries at different times. Welfare stigma varies considerably across countries, and unemployment and poverty rates appear to be positively related with stigma, even after controlling for institutional labor market features and the business cycle. While standard job-search models predict the opposite result, the model we propose is consistent with the empirical evidence.

The paper is organized as follows. Section 2 deals with the theoretical and empirical literature on welfare stigma. The model is described in Section 3. Theoretical implications on the behavior of decision makers are derived in Section 4. The simulation design is described in Section 5. Results are discussed in Section 6. Section 7 is devoted to empirical evidence. An index of welfare stigma is proposed, and the relation between stigma and the relevant economic outcomes analyzed. Concluding remarks follow in Section 8.

2. Welfare stigma in the literature

Stigma is defined as “an attribute which is deeply discrediting” (Goffman, 1963); it is attributed to a personal characteristic that negatively portrays deviants. Those labeled deviant have violated highly accepted rules or norms: the devaluation of deviant individuals and groups entails a

negative assessment of personal character. With respect to welfare recipients, Paugam (1997) argues that: “It is from the moment they are assisted, maybe from the moment their condition might entitle them to social assistance [...], that they become part of a group which is characterized by poverty. This group is not unified through the interaction between its members, but through the *collective attitude* society as a whole adopts towards it”. The perception that being on welfare is recognized by some societies as a deviant behavior generates in recipients feelings of lack of self-respect and negative self-characterization (Rainwater, 1979).

Stuber and Schlesinger (2006) distinguish between *identity stigma*, defined as a negative self-characterization, led by the widespread stereotypes which are internalized also by the recipients themselves, and *treatment stigma*, the anticipation of negative treatment, related to the concern of being treated poorly by others. Yaniv (1998) defines welfare stigma as the negative feelings of shame and disrespect arising from being on welfare. He suggests that there is a *self-afflicted* component “emanating from one’s own recognition .. independent of other people’s knowledge of one’s participation, that could arise even if one’s identity were kept in complete secrecy”, and a component involving other people’s attitudes and beliefs, which needs *public exposure* to operate, and thus others who become aware of one’s participation.

A strand of the empirical sociological literature (Kerbo, 1976; Rogers-Dillon, 1995; Jarrett, 1996; Stephenson, 2001; Stuber and Schlesinger, 2006) aims at understanding how stigma is generated and how welfare recipients manage with it. Welfare stigma appears to be related to the reportedly negative treatment of applicants by staff in welfare offices and the often intrusive nature of the personal information required upon application.

Besley and Coate (1992) examine how stigma is generated by a broader perspective. The equilibrium level of stigma in a given society is derived under two alternative theoretical models: i) the *statistical discrimination model*, according to which stigma depends on the perceived personal characteristics of welfare claimants: society is deemed to value certain individual characteristics such as self reliance and willingness to work hard; welfare claimants are treated poorly because they are believed to possess fewer of these characteristics, *on average*; ii) the *taxpayer resentment view model*, where taxpayers, who finance the program, may regard the benefit level to be too generous; the amount of resentment is an increasing function of the difference between the actual benefit level and that which is regarded to be desirable. The authors emphasize the relationship between program design and stigma, and derive under both models that a rise in the benefit increases welfare stigma, while improved targeting and workfare should reduce it; they also claim that stigma may help to reduce the number of undeserving claimants.

Stigma is commonly regarded as being one of the determinants of welfare participation (see Currie, 2004 and Hernanz *et al.*, 2004 for extensive reviews). Welfare participation rates (the proportion of *individuals* on welfare) and take-up rates (the proportion of the *eligible* on welfare) are the focus of an extensive body of work. The attempt is to explain the observed variation in the caseload and the relation between program features and participation. The interest on welfare participation rates rests on the aim of keeping low the overall number of people who rely on government support for living, which can be accomplished by reducing the number of people in need. On the other hand, since take-up rates are generally far from complete coverage in most programs and countries, the concern is that welfare policies will have a limited impact on the goal of alleviating poverty if a significant share of those who are entitled for the benefit do not claim it.

Assuming rational individuals who do not make systematic forecasting errors and maximize their utility, stigma is incorporated in a number of models for welfare participation decisions (Moffitt, 1983; Besley and Coate, 1992; Anderson and Meyer, 1997; Yaniv, 1998; Blundell *et al.* 1998; Riphahn, 2001). Following the seminal work of Moffitt (1983), stigma is most often modeled as a fixed cost of being on welfare. Moffitt (1983) jointly models the choices of entering welfare and the number of hours of work. In addition to the flat component, stigma is also allowed to represent a cost proportional to the size of the benefit, although this component does not appear to be empirically relevant. The utility function parameters are allowed to vary across individuals, thus welfare participants are a self-selected sample of the population, who would work less than non-participants even in the absence of the program. Income support affects the available choices of everybody; and those who are not initially eligible may modify their behavior in order to gain access to the program. In this framework, given the level of the benefit, take-up and participation rates are expected to decrease with the amount of stigma. Moreover, by reducing the incentives of being on welfare, stigma is expected to have a *positive effect on labor supply*.

Yaniv (1998) develops a static model for welfare participation and welfare spell length, in the context of workfare programs with mandatory work. Public exposure, elicited by mandatory work, is the channel through which social stigma is inflicted upon a claimant. Yaniv argues that the flat disutility component of Moffitt (1983) or Besley and Coate (1992) is not adequate if “public exposure (and thus the number of significant others who become aware of one’s participation) varies with the *amount of time on welfare*”. Stigma and fraud are modeled under the same framework: his conclusion, as opposed to Besley and Coate (1992), is that stigma

effects are stronger in reducing the application rates of eligible individuals than in discouraging fraud.

There is also a growing interest in the role of social networks in welfare use (Borjas and Hilton, 1996; Bertrand *et al.*, 2000; Aizer and Currie, 2004, Stuber and Schlesinger, 2006); these studies emphasize that social networks might reduce the cost of participation by favoring information sharing or reducing stigma.

3. The model

Job-search models (Pissarides, 2000; Rogerson *et al.* 2006) analyze the rational, maximizing behavior of the unemployed with respect to their search intensity, and of the firms with respect to the number of vacancies to open. In their simplest form, conditional on the level of search intensity the unemployed are subject to random job offers, that may be accepted or rejected according to the future value of utility associated with the different options. Benefit provisions (e.g. unemployment or poverty subsidies) increase the reservation wage: the larger the subsidy and the longer its expected duration, the less individuals are attracted by work, triggering the so-called ‘welfare trap’.

We develop a partial equilibrium model where we focus on the choices of the unemployed, who experience a decay in their employment prospects as unemployment duration increases. We leave the choices of the firms as exogenous; this is justified by the fact that we are interested on a weak segment of the working age population, the low-skilled, low-productivity, at risk of poverty. Hence, we can assume that the individual behavior of those we model does not affect the choices of the firms with respect to the number of vacancies to open, and does not shape the employment prospects of other individuals, due to increased or reduced competition for the existing vacancies. The higher degree of homogeneity of these individuals allows to consider an exogenous and constant wage for those who become employed. We assume that this wage is low enough for not allowing savings and thus wealth accumulation. As a consequence, in absence of welfare assistance, unemployed individuals are also poor.

We model two individual choices: whether to *search for a job* and whether to *be on welfare*. The effect of search is standard: search activity lowers current utility by reducing time for leisure; however, it also increases the probability to find a job, and thus expected future utility. The effect of being on welfare is not as straightforward, as we will now discuss.

The distinctive feature of our model is the way we treat stigma. In line with Moffitt (1983), we assume that stigma entails a fixed cost on welfare participation. We relate this cost to the

negative self-characterization due to living on public support (*identity stigma*), but also to the *concern* of being treated poorly by others (*treatment stigma*, Stuber and Schlesinger, 2006).

In addition to this *direct* effect on utility, however, we also consider an *indirect* effect of stigma, bringing about a decrease in the employment prospects, which in turns affects the job-search decision.

If living on public support exposes the individual to social disqualification, behavior may be affected by psychological factors, in line with the “expectancy” model of welfare dependence described in the influential work of Bane and Ellwood (1994). They argue that prolonged welfare participation “[...] may result when people lose a sense of control over their lives, when they cease to believe that they can realistically get off welfare. People become overwhelmed by their situation and lose the ability to seek out and use the opportunities available”. Loss of confidence “[...] may reflect a lack of information. [...] people often incorrectly perceive their level of control over their destiny”. These effects may imprison welfare recipients in marginal social networks and isolate them, even more than being unemployed, from those social contacts which help to gain access to work opportunities. Since psychological effects are likely to take place gradually, the result may be a *progressive reduction of the employment probability*.

Beside affecting the recipient’s self-confidence, stigma may also affect the behavior of prospective employers. According to Yaniv’s idea of *public exposure*, as time elapses more people will become aware that recipients are on welfare, increasing the likelihood that potential employers will not hire them. Hence, once in welfare, recipients may actually *experience* negative treatment, further reducing the employment probability¹.

The second peculiarity of our model is that decision makers are assumed to have limited forecasting ability, thus they cannot adopt an infinite time horizon as posited in standard models: instead, they evaluate the value of the alternative options they face by looking ahead for h periods. The assumption of limited forecasting ability is consistent with a bounded rationality approach (Simon, 1982), where individuals seek a sequential search solution to an optimization problem with deliberation and information processing costs (Day, 1963). As Pingle (2006) puts it: «people do maximize, but cognitive scarcity leads the decision maker to simplify a more complex problem by decomposing it into a sequence of simpler problems. The form of the problem at each stage in the sequence is conditioned by past decisions and by observed changes in the decision environment. Solutions at each stage are optimal. However, because each stage

¹ The empirical evidence of decreasing employment probability as elapsed time on welfare grows longer, however, is weak. Still, as Bane and Ellwood (1994) argue, research on this issue is limited and difficult to interpret. Moreover, they say, “It seems ludicrous to argue that motivation and self-worth are not linked closely to behavior, especially to behavior on welfare.” (Bane and Elwood, 1994; pg. 118). The empirical strategies used in the literature will be discussed more thoroughly in Section 3, footnote 5.

examines only a fraction of the available set of alternatives, the decision sequence need not to converge to a global optimum». Despite the fact that there are practical (i.e. computational) reasons for assuming a finite time horizon, we find this perspective convincing, and coherent with our focus on weak individuals².

In a similar perspective, we also consider that individuals may not correctly anticipate the decay of employability due to *being on welfare*: on the one hand, they might be able to foresee the negative attitude of potential employers, on the other hand, it is unlikely that they will predict the psychological effects. In this respect, we consider two versions of the model, that may be considered as benchmarks: in the first, we assume that individuals correctly anticipate this decay; in the second, we assume that individuals do not anticipate it at all. Given that forecasting ability is altogether imperfect as individuals look ahead for only h periods, we will refer to the first as *strong forecasting*, and to the second as *weak forecasting* model

3.1 Model specification

Current utility

Let $U = U(C, L)$ be the current utility function associated with consumption C and leisure L . With no stigma there is no cost of entering welfare, thus the unemployed will always claim the benefit. Moffitt (1983) proposes the following model to incorporate stigma:

$$U(C, L, a) = U(C, L) - \phi a \quad (1)$$

where $a=1$ if the individual is on welfare and 0 otherwise, and ϕ is the fixed cost of being on welfare. The negative effect of stigma might outweigh the higher level of consumption provided by the subsidy: individuals are now called to choose whether to search for work and whether to claim the benefit³.

To simplify the environment, we operate in a rigid labor market with full time jobs only. Unemployment benefits and social assistance are treated in a unified framework. People are assumed to consume all their earnings (there are no savings, nor other sources of income), thus consumption amounts to current income: C_E if employed, C_0 if unemployed with no benefit, and

² Note however that since the contribution to expected utility of periods far away in time becomes negligible (because individual discount future utility), and since h can be in principle increased at will, the results for high values of h should not differ much from those with an infinite time horizon. The consequences of decreasing employability with time elapsed in unemployment alone (due to loss of skills) are the focus of a related paper (Richiardi and Contini, 2009), under the assumption that individuals perfectly forecast their future prospects with an infinite time horizon. In that context, the optimal behaviour is derived analytically.

³ We assume that stigma is the only factor responsible for take-up behaviour. Various potential explanations of low-take-up rates for welfare benefits have been addressed in the literature, other than social and psychological costs (stigma), e.g. pecuniary determinants, information costs, administrative costs, (Hernanz *et al.*, 2004).

C_B with income support, where $C_0 < C_B < C_E$. We assume that benefits leave people below the poverty threshold, so that *all the unemployed are poor* (and vice-versa). A universalistic policy is considered: all the unemployed are eligible for welfare benefits (the means test being always satisfied in our setting), which are in principle of unlimited duration.

Standardizing total time to 2, we fix the minimum time for leisure L to 1; time for work is 1 and time devoted to job search is either $s=0$ or $s=1$. Hence, non employed individuals either undertake full search in the reference period, or no search at all. This binary choice can be a reasonable simplification if the duration of each period is limited; alternatively, it can be derived as a corner solution of the utility maximization problem if both the individual utility and the probability of finding a job are linear in s , as in Richiardi and Contini (2009)⁴. No search on the job is allowed, so that $L=1$ for the employed and $L=2-s$ for the unemployed. Market wage is always higher than individuals' reservation wage: $U(C_0,2) < U(C_E,1)$, implying that, if no benefits are provided, it is better to work rather than not work.

We will refer to the following conditions, which might or might not be satisfied:

$$U(C_E,1) > U(C_B,2) \quad (\text{condition E})$$

$$U(C_B,s) > U(C_U,s) \quad (\text{condition A})$$

Condition E states that the utility from being employed is higher to that of being on welfare, irrespective of search behavior, since $U(C_B,2) > U(C_B,1)$. Condition A states that the utility from being assisted is higher than the utility from not being assisted, given search behavior.

In this framework, equation (1) becomes:

$$U(C,L) = [U(C_0,2-s)]^{1-a} [U(C_B,2-s) - \phi]^a \quad (2)$$

For computational purposes, the actual specification of the term $U(C,L)$ in (1) will be based on the simple Cobb-Douglas function $U = C^\alpha L^\beta = C^\alpha (2-s)^\beta$.

Employment probability

The probability of finding a job is allowed to decay with elapsed time in *unemployment*, as skills tend to become obsolete and social contacts facilitating the match between labor supply and demand loosen (Granovetter, 1995). Moreover, we assume that stigma can be the cause of a further progressive reduction in employment prospects as time spent on *welfare* grows longer. The employment probability is thus specified as follows:

⁴ We do not distinguish here between the unemployed and the non-employed. In our model those who do not work are in principle willing to work: if they don't it is because they are discouraged and/or the value of work is too low.

$$p_t = \gamma_0 (1 - \theta_U)^{\tau_U} (1 - \theta_A)^{\tau_A} \quad (3)$$

where γ_0 is the corresponding probability at the beginning of the unemployment spell. Loss of skills developing with time elapsed in unemployment is related to θ_U , while reduction of work opportunities triggered by welfare participation, occurring when stigma is present, is related to θ_A . τ_U and τ_A are respectively the time elapsed in unemployment and on welfare. Since people can delay welfare entry, $\tau_A \leq \tau_U$. With no search the probability of receiving job offers is 0. For simplicity, we assume that employment is an absorbing state⁵.

Letting the employment probability change with time elapsed in unemployment, although theoretically well founded, may seem to be an unnecessary element of the simulation design, as it is not the focus of the investigation. Notice however that there is an important practical reason for it: fixing $\theta_U > 0$ amounts to introducing time variability in the individual employment probability, which is necessary to have the possibility of an unemployed individual changing behavior over time. If $\theta_U = 0$, an individual who chooses at time t not to enter welfare will face exactly the same conditions at time $t+1$: hence, she will never find it convenient to enter welfare; moreover, she will have no incentives to change her searching behavior, too. Since, as we will show below, individuals never want to exit welfare once they are in, this amounts to have either individuals who are always assisted, or individuals who are never assisted.

⁵ A large body of research has focused on unemployment exit rates and has provided strong evidence of decreasing employability ($\theta_U > 0$ in our model). On the other hand, as we have anticipated in footnote 1, empirical evidence of decreasing employability due to being on welfare is limited. As claimed by Bane and Ellwood, this effect is difficult to identify empirically. Some studies are aimed at assessing whether welfare exit rates exhibit (true) negative duration dependence (ndd): ndd means that exit becomes more difficult as elapsed time on welfare grows longer, and many authors interpret this pattern as evidence that welfare has a corruptive effect on recipients (see Contini and Negri, 2007 for a discussion on this point). Yet, this not a sound empirical strategy. As we show in Section 6, $\theta_A > 0$ is a sufficient condition for ndd in our model (it is not a necessary condition, because declining exit rates may also be due to $\theta_U > 0$); hence no duration dependence would indeed be a proof that $\theta_A > 0$. In a more complex environment, however, a flat empirical hazard rate may still be consistent with $\theta_A > 0$. First, people may exit welfare for reasons other than employment: benefit can be withdrawn because it is of limited duration or individuals no longer meet other eligibility requirements, or because people migrate or die. In this light, welfare to work transitions should be analyzed in place of welfare exit rates. Second, if income support is not unlimited, individuals are likely to increase their job-search effort near the exhaustion of the benefit (Pellizzari, 2005), making it difficult to identify the effect of θ_A if the model is not properly specified. Third, since it is well known that ndd may be a spurious effect due to neglected heterogeneity, empirical studies estimate the baseline hazard after (observed or unobserved) heterogeneity has been taken under control. Typically, this is done under the assumption of proportional hazards; if it does not hold, however, (because different sub-groups behave differently or because of interaction effects) a flat mixture hazard may show up even if the exit rate is decreasing for some categories of recipients. These caveats notwithstanding, works focusing on the shape of welfare exit rates results are inconclusive: Walker and Shaw (1997) and Gustaffson et al (2002) report no duration dependence for social assistance benefits in some European countries; mild evidence of ndd is provided in O'Neill et al (1987), Blank (1989), Fitzgerald (1991), Sandefur and Cook (1998) on the US program AFDC (*Aid to Families with Dependent Children*), and in Fortin and Lacroix (1998) on Canadian social assistance, while strong evidence is found in Chay et al. (2004) on AFDC. Dahl and Lorenzen (2003), analyzing the welfare to work transition for Norway, find no evidence of ndd.

In order to distinguish between the two effects of stigma, parameter ϕ will be referred to as the *utility* component of stigma and θ_A as the *employability* component of stigma.

3.2 Cognitive features

In making their decisions, our unemployed individuals only consider a limited plan horizon h , i.e. they only look at what may happen h periods ahead. Hence, search effort and welfare participation at time t are determined by $\max_{(s_t, a_t)} V_t$, where V_t is given by:

$$V_t = \sum_{i=0}^h E[U_{t+i}] R^i \quad (4)$$

$E[U_{t+i}]$ is the expected utility at time $t+i$, and $R \in (0,1)$ is a discount factor. The parameter $h \in [1, \infty)$ determines the cognitive boundaries of the individuals. When $h = 1$ the model is trivial: since if the future is not considered at all, the most convenient choice is taking the benefit while not searching.

A second departure from full foresight capacity regards the correct anticipation of the decay in employability due to being on welfare. We will consider two versions of the model: one where individuals compute their employment prospects in (4) making use of the correct formula (3), (in short, *strong forecasting* ability); the other (*weak forecasting* ability) where individuals implicitly assume $\theta_A = 0$ in equation when they compute their expected utility in (4). In any case, to prevent the model from the deadlocks described above, individuals are assumed to correctly anticipate θ_U , their decay in employability due to prolonged unemployment⁶.

Individuals make plans for action over the entire plan horizon h , that is, they identify a strategy $\{s_t^*, \dots, s_{t+h}^*; a_t^*, \dots, a_{t+h}^*\}$ conditional on being still unemployed up to time $t+h$; however, they always implement only the first step of this strategy, $\{s_t^*; a_t^*\}$, and re-evaluate it in the next period, as in a sort of moving window.

4. Individual behavior

⁶ It can be argued that correctly forecasting the loss in employability due to unemployment is an easier task than correctly forecasting the loss due to welfare participation: the first being mainly originated from a change in individual characteristics (decay of skills, etc.), while the second being originated by psychological factors or by a change in the way others evaluate individual characteristics (stigma).

We posit that actual individual choices can be summarized by two numbers: the time at which the individual stops searching, t_s^* , and the time at which the individual enters assistance, t_a^* . We therefore rule out the possibility that an individual starts searching after some periods of inactivity, and the possibility that an individual exit welfare: inactivity and assistance are two absorbing states.

In order to argument that this is the optimal behavior, we explore analytically a simplified setting with a planning horizon of 2 periods. We prove that in such a setting the behavior described above is indeed optimal. We then discuss why this result should hold also for longer planning horizons.

4.1 The model with 2-period planning horizon

The proof that with a planning horizon of 2 periods individuals never go back to searching after they have stopped, and they never exit welfare once they are in, is in two steps: (i) we show that individuals never *plan* to do that, and (ii) we show that when they re-evaluate their optimal strategy period after period, they never actually *do* it.

Optimal strategy

If we limit the planning horizon to two periods, in each period individuals have to choose among $4 \times 4 = 16$ alternatives, as shown in Table 1:

Table 1. Possible choices, 2 periods planning horizon

$t = 0$		$t = 1$
$s = 0, a = 0$		$s = 0, a = 0$
$s = 0, a = 1$	×	$s = 0, a = 1$
$s = 1, a = 0$		$s = 1, a = 0$
$s = 1, a = 1$		$s = 1, a = 1$

We have to show that any strategy with $\{s_0 = 0, s_1 = 1\}$ or $\{a_0 = 1, a_1 = 0\}$ cannot be optimal. As for what regards the first condition, it is enough to notice that it is never optimal to plan searching in the last period of the planning horizon, since searching comes at a utility cost, but the benefits fall outside the planning horizon. In a two-period planning horizon, ruling out any strategy with $s_1 = 1$ is enough to show that individuals never revert to searching. The constraint $s_1 = 0$ restrict the set of alternatives to the following eight choices (Tab. 2):

Table 2. Relevant choices, 2 periods planning horizon

	$t = 0$		$t = 1$
1.	$s = 0, a = 0$	×	$s = 0, a = 0$
2.			$s = 0, a = 1$
3.	$s = 0, a = 1$	×	$s = 0, a = 0$
4.			$s = 0, a = 1$
5.	$s = 1, a = 0$	×	$s = 0, a = 0$
6.			$s = 0, a = 1$
7.	$s = 1, a = 1$	×	$s = 0, a = 0$
8.			$s = 0, a = 1$

The value attached to each choice is shown in equation 5:

$$\begin{aligned}
V_1 &= (1+R)2^\beta C_0^\alpha \\
V_2 &= 2^\beta C_0^\alpha + R(2^\beta C_B^\alpha - \phi) \\
V_3 &= 2^\beta C_B^\alpha - \phi + R2^\beta C_0^\alpha \\
V_4 &= (1+R)(2^\beta C_B^\alpha - \phi) \\
V_5 &= C_0^\alpha + (1-p_0)R2^\beta C_0^\alpha + p_0RC_E^\alpha \\
V_6 &= C_0^\alpha + (1-p_0)R(2^\beta C_B^\alpha - \phi) + p_0RC_E^\alpha \\
V_7 &= C_B^\alpha - \phi + (1-p_a)R2^\beta C_0^\alpha + p_aRC_E^\alpha \\
V_8 &= C_B^\alpha - \phi + (1-p_a)R(2^\beta C_B^\alpha - \phi) + p_aRC_E^\alpha
\end{aligned} \tag{5}$$

with p_0 and $p_a = p_0(1 - \theta_A)$ being the probability of finding a job, conditional on active search, respectively without and with assistance at time $t = 0$.

To further restrict the set of available choices, note that it cannot be convenient to defer welfare entry, if an individual has already stopped searching. This is because unemployed individuals who do no search do not mind a further depreciation of their search effectiveness: thus, they either immediately enter welfare, or they never do, depending on ϕ and C_B . Alternative 2 is therefore always dominated, either by alternative 4 or by alternative 1, depending on whether condition A holds.

To show that it is not optimal to plan to exit welfare, we compare V_3 with V_4 and V_7 with V_8 . In both cases, the decision to exit welfare at time $t = 1$ would be optimal if and only if condition A does not hold, and $C_0^\alpha > C_B^\alpha - \phi$. However, if this was the case, it would have been optimal not to enter welfare in the first period, at $t = 0$. This shows that, if the original decision to enter welfare was rational, it is not convenient to subsequently reverse it. This finally restricts the set of relevant choices to the five alternatives labeled 1, 4, 5, 6 and 8 in Table 2.

Re-evaluation of the optimal strategy

We now look at what happens when the optimal strategy is re-evaluated one period ahead. First, note that, if the optimal strategy at time t was strategy 1 or 4 (that is, if no search was undertaken

in t), it has to be confirmed at time $t+1$. This occurs because employment prospects deteriorate (hence, V_5 , V_6 and V_8 decrease), but this does not matter if the choice was not to search anyway (V_1 and V_4 do not change). This proves that individuals never actually revert to searching.

In order to show that individuals never exit welfare once they are in, it is enough to prove that, if the optimal strategy in t was strategy 4 or 8 ($a_t = 1$), it must be the case that in $t + 1$ the optimal strategy is still either strategy 4 or 8 ($a_{t+1} = 1$). We have already shown that strategy 4 is absorbing; we now look at what happens to strategy 8.

If V_8 was the maximum value in t , it must be that condition A holds: this is easily verified by comparing V_8 with V_6 , and noting that $p_a < p_0$. Condition A means that $2^\beta C_B^\alpha - \Phi > 2^\beta C_0^\alpha$, which in turns implies $V_1 < V_4$ and $V_5 < V_6$. Therefore, we only have to show that if $V_8(t) > V_6(t)$, it cannot be that $V_6(t+1) > V_8(t+1)$. This is easily done by noting that $p_a < p_0$ irrespective of t^7 . This, together with condition A and condition E, ensures $V_8(t+1) > V_6(t+1)$.

4.2 Discussion

We have shown that, in a 2-period planning horizon model, the optimal behavior can be summarized by (t_s^*, t_a^*) , which identifies the moments in which the individual stops searching and enters assistance. In principle: $t_s^* \in [0, \infty)$ and $t_a^* \in [0, \infty]$. When $t_s^* = 0$ the individual never searches; if $t_a^* = 0$ she enters welfare immediately, if $t_a^* = \infty$ she never does. An individual can enter welfare before she stops searching, but she will never find it optimal to do it afterwards: either $t_a^* \leq t_s^*$, or $t_a^* = \infty$, i.e. she never enters welfare.

To argue that this characterization is also valid for longer planning horizons, we first invoke the result of Richiardi and Contini (2009), who show that with no stigma and infinite planning horizon ($\phi = 0, \theta_A = 0, h = \infty$) the optimal strategy is to stop searching at some time t_s^* . In this context, granting a benefit (which is automatically accepted since it entails only positive utility effects) produces an anticipation of the time at which the individual stops searching.

Finally, although in the simulations below we assume that individuals never *plan* to exit welfare once they are in, no restrictions are imposed on *actual behavior*. In principle recipients are allowed to exit welfare even if still unemployed, because their strategy is re-evaluated period after period; the fact that this is *never* observed confirms that the results for the 2-period planning horizon are of more general validity.

⁷ if $a_t = 1$, then $p_0(t+1) = p_0(t)(1 - \theta_U)(1 - \theta_A)$, and $p_a(t+1) = p_0(t)(1 - \theta_U)(1 - \theta_A)^2$

4.3 Expected effects of stigma

We now discuss the expected effects of the stigma parameters ϕ and θ_A on the relevant outputs of the process: welfare take-up rates, job-search, unemployment rates, welfare participation rates, unemployment and welfare spell length.

With respect to longitudinal outputs, let T_U and T_A be the random variables describing the length of the unemployment and welfare spells. Then $h_U(t_U) = P(T_U = t_U | T_U > t_U - 1)$ is the discrete unemployment hazard function: the hazard is defined as the conditional probability of exiting unemployment (i.e., finding a job) given survival up to time t_{U-1} . Similarly, the welfare hazard function is $h_A(t_A) = P(T_A = t_A | T_A > t_A - 1)$; in the light of the previous discussion it does not prove to be rational to move out of welfare once entered, thus finding a job is the *de facto* condition for exiting welfare as well. According to equation (3), the employment probability depends on elapsed time in unemployment and elapsed time on welfare. Hence, both the unemployment and the welfare exit rates depend on past unemployment and social assistance behavior and exhibit true negative duration dependence if $\theta_U > 0$ or $\theta_A > 0$. The unemployment exit rate conditional on (t_s^*, t_a^*) is given by:

$$h_U(t) = \begin{cases} \gamma_0(1-\theta_U)^{\tau_U} & \text{if } (t < t_s^*) \cap (t < t_a^*) \\ \gamma_0(1-\theta_U)^{\tau_U} (1-\theta_A)^{\tau_A} & \text{if } (t < t_s^*) \cap (t > t_a^*) \\ 0 & \text{if } (t > t_s^*) \end{cases} \quad (6)$$

and the corresponding welfare exit rate is:

$$h_A(t) = \begin{cases} \gamma_0(1-\theta_U)^{\tau_U} (1-\theta_A)^{\tau_A} & (t < t_s^*) \cap (t > t_a^*) \\ 0 & \text{if } (t > t_s^*) \end{cases} \quad (7)$$

Expected effect of the utility component of stigma

ϕ represents a cost of welfare participation and thus reduces the value of being on welfare. Not all the eligible claim the benefit with stigma: take-up rates steadily decline with growing ϕ . Also the value of unemployment decreases, hence search effort is positively affected by ϕ . Since more people undertake an active job-search with stigma with respect to a no-stigma environment, ceteris paribus unemployment rates decline. Accordingly, welfare participation rates (given in our framework by the product of the take-up rate and the unemployment rate) are negatively affected by ϕ . These results are discussed by Moffitt (1983), who implicitly refers to the case $\theta_A=0$, but the same arguments should hold for fixed value of $\theta_A > 0$. ϕ does not affect behavior

once on welfare: welfare exit rates, given elapsed unemployment, do not depend on ϕ . However, only lower employment prospects individuals enter welfare as ϕ increases: due to this self-selection, we expect longer welfare spells.

Expected effect of the employability component of stigma

Welfare take-up behavior

If individuals are able to forecast the loss of employability due to welfare participation, the future reduction of the value of being on welfare is correctly anticipated. θ_A will act, like ϕ , as a disincentive: ceteris paribus, welfare entry will be delayed until employment prospects fall below a certain level. Entry will not be affected, instead, if individuals do not anticipate the reduced probability to find a job.

Search behavior

We expect individuals to stop searching earlier once on welfare as θ_A increases, since the unemployment exit probability declines at a higher speed. Yet, if the loss of employability is correctly anticipated we also expect time of welfare entry t_a^* to be delayed, and time of no-search t_s^* to be postponed⁸. Hence, with strong forecasting the direction of the effect is theoretically *undetermined* and potentially not monotonous. On the other hand, t_a^* is not affected if the effect of employability stigma is not anticipated; search effort should decrease with rising employability stigma with weak forecasting.

Welfare spell length

Welfare exit rates decline faster with higher θ_A , hence, welfare spell length *increases*. This a behavioral effect. With perfect forecasting a selection effect is at work as well. Since individuals anticipate their lower future employment prospects, the threshold t_a^* increases and welfare entry is delayed: welfare spells are longer also because only the less endowed individuals actually claim the benefit.

Unemployment spell length

⁸ The result is a generalization of Proposition 2 in Richiardi and Contini (2009), with respect to infinite time horizon forecasting, no stigma, and loss of employability driven by θ_U .

Given welfare participation, unemployment exit rates decrease with rising θ_A : consequently unemployment spells should grow *longer* for welfare recipients. On the other hand, with full forecasting ability, individuals will delay welfare entry; the employment probability remains higher and the unemployment spell length is *reduced*. The effect of θ_A is theoretically *undetermined* in this case.

Unemployment rates

Since all individuals in the model are unemployed ‘at birth’, unemployment rates behave as unemployment duration. The longer the unemployment spells, the higher the unemployment rates. Hence, with imperfect forecasting unemployment rates should grow steadily with θ_A , while with perfect forecasting the effect should be *undetermined*.

Welfare participation rates

The percentage of individuals who are on welfare in a specific point in time depends on the number of unemployed (the eligible), the proportion of eligible claiming income support and the length of welfare spells. With weak forecasting: welfare spells get longer with θ_A , take-up rates remain unchanged, unemployment rates rise; thus welfare participation rates *rise* with θ_A . With strong forecasting: welfare spells grow longer, take-up rates decrease, while the effect on unemployment rates is a priori not clear: as a consequence the net effect of θ_A on welfare participation rates is theoretical *undetermined*.

5. The simulation design

The model is investigated by means of a discrete-time agent-based simulation (Tsfatsion 2006)⁹. At time 0, a population of N unemployed individuals is created. All individuals are identical, except for their age, which is randomly distributed between 0 and $maxAge$. Age measures experience in the labor market: hence, an agent with age 0 is a new entrant; an agent with age $maxAge$ retires, independently of how many periods of employment she has experienced. In each period t , every individual computes her optimal strategy over the planning horizon (from t to $t+h$), and implements it for the current period (with behavior $\{s_t, a_t\}$). When an individual reaches age $maxAge$, she is replaced by another individual of age 0. Hence, the initial conditions (all individuals start as unemployed) affect the state of the system for exactly

⁹ The simulation is build on the open source JAS simulation platform (Sonnessa 2004). The Java code can be downloaded from <http://utenti.dea.univpm.it/richiardi/code/Stigma.rar> or requested to the authors.

$maxAge$ periods, when the system, which clearly is stationary and ergodic, converges to its long run behavior.

There is no interaction between different individuals. However, considering a large number N of individuals with uniformly distributed age allows to compute aggregate statistics. As an example, the resulting unemployment rate has a double interpretation: on the one hand, it is the aggregate (cross-sectional) unemployment rate of the specific population of individuals considered; on the other hand, it is the expected (longitudinal) fraction of time passed in unemployment, for any individual, over its stay in the labor market. The pseudo-code is reported in Figure 1.

```

At  $t = 0$ :
- initialize a population of  $N$  identical individual, with age
  randomly extracted in  $[0, maxAge]$ 

At every period, for every unemployed agent:
- compute optimal threshold strategy  $\{s_t^*, a_t^*\}$  over planning horizon
- implement it for current period:
  -- if  $a_t = 1$ : get benefit
  -- if  $s_t = 1$ : search for a job
  --- if a job is found exit unemployment

At every period:
- replace old individuals with newborn (unemployed)
- compute statistics

```

Figure 1. Pseudo-code of the simulation

6. Results

In order to analyze the behavior of the model, we first perform a sensitivity analysis for the relevant parameters around a default configuration, in the stationary state. By letting each parameter change one at a time, we compute the equivalent of the partial derivatives at the equilibrium. We report the results for the (cross-sectional) take-up, unemployment and welfare participation rates, and the (longitudinal) unemployment and welfare spell length. We then analyze the effects of a joint variation of both components of stigma, around the default configuration. Finally, we test the general validity of the crucial relationship we identify – the effect of the employability component of stigma on the unemployment rate – by repeating the sensitivity analysis for a high number of randomly chosen configurations of the parameters.

6.1 Local analysis

The values of the parameters used for the sensitivity analysis are reported in Table 3. The parameters in panel (b) are allowed to vary one at a time, while all the others are held constant, according to the values reported in panels (a) and (c). This allows to analyze the behavior of the economic outcomes of interest with respect to each of the relevant parameters, *ceteris paribus*.

The parameters are not empirically calibrated. “Reasonable” values are employed when possible. As an example, market wage is set to four times charity income (recall that we are dealing with of a weak sector of the labor force), while the benefit lays somewhere in between, mimicking the fact that in some countries it is near the subsistence level while in others it is close to minimum wage.

The time unit can be thought as a month; being a very small span, the discount factor is close to 1. Individuals are followed for 120 time units, hence “life time” is 10 years.

The exponents in the utility function are set to $\alpha = 2$ and $\beta = 0.5$: these values are chosen to keep low the value of leisure, in order to make the search option sufficiently likely, given the values for the consumption levels.

The parameters over which the sensitivity analysis is performed are ϕ and θ_A , characterizing stigma, and the planning horizon h , symbolizing individual’s cognitive boundaries. We also allow variation in the initial employment probability γ_0 (as it is likely to change greatly within time and space) and in the benefit level C_B (modifiable by welfare policy). Wishing to keep the value of current utility with no benefit lower than that with income support (otherwise no one would ever enter welfare), ϕ never exceeds C_B^2 .

Table 3. *The default configuration of the parameters*

(a) Fixed parameters	
<i>Income</i>	$C_0 = 1$ $C_E = 4$
<i>Utility function</i>	$\alpha = 2$ $\beta = 0.5$
<i>Life length</i>	$maxAge = 120$
<i>Discount factor</i>	$R = 0.99$
<i>Loss of employability/ Unemployment</i>	$\theta_U = 0.05$
(b) Variable parameters	
<i>Benefit</i>	$C_B \in (1,4)$
<i>Stigma cost</i>	$\phi \in [0, C_B^2]$
<i>Initial employment probability</i>	$\gamma_0 \in [.05, .35]$
<i>Loss of employability/ Welfare stigma</i>	$\theta_A \in [0, .2]$
<i>Time horizon</i>	$h \in [1, 12]$
(c) Default configuration for variable parameters	

$$C_B = 2.5, \phi = 4, \gamma_0 = 0.15, \theta_A = 0.1, h = 6$$

The effects of ϕ , C_B and γ_0 are in line with those predicted by standard models: an increase in the utility component of stigma reduces take-up rates and unemployment; an increase in the amount of the benefit increases take-up rates and unemployment; an increase in the initial employment probability lowers take-up rates and unemployment. They are therefore not discussed in further details.

The effect of θ_A

Our main findings are depicted in Figures 2 and 3. With weak forecasting, the probability of active job-searching decreases and the unemployment rate will steadily rise with θ_A . Instead, with strong forecasting the share of job seekers follows a U shape. Symmetrically, the unemployment rate decreases until it reaches certain threshold after which it starts increasing. The intuition is that when stigma is low individuals enter welfare at the beginning of the unemployment spell; unemployment rises because search effectiveness diminishes and the less endowed stop searching. On the other hand, when θ_A is too high, individuals anticipate the higher risk of welfare trap and decide to postpone welfare entry and keep searching.

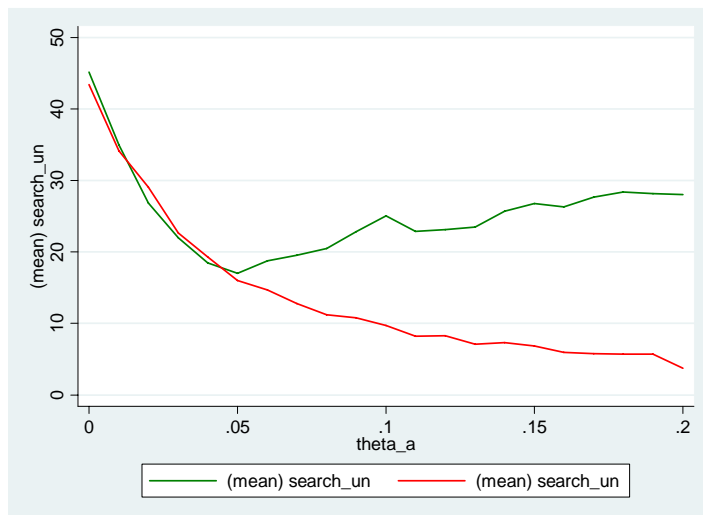


Figure 2. Percentage of active job seekers with varying θ_A

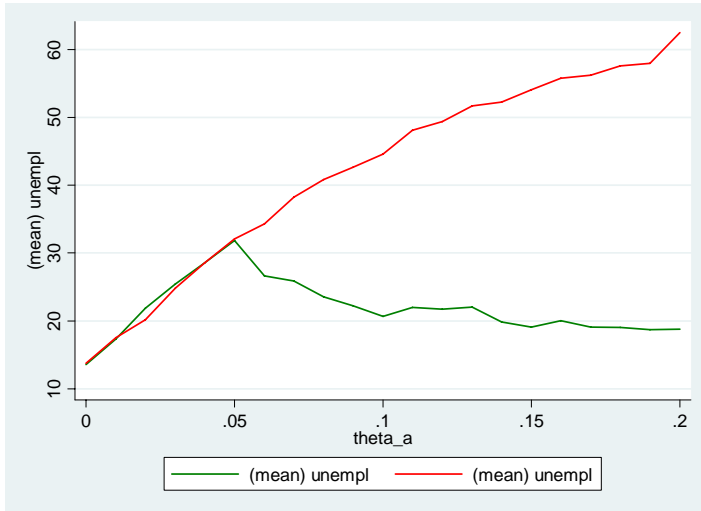


Figure 3. Unemployment rates with varying θ_A

The job-searching behavior among welfare recipients is depicted in Figure 4: the share of those actively seeking for work decreases as θ_A increases. Consequently, welfare spells grow longer (Figure 5). Consistently with the expectations, these patterns are more pronounced with strong forecasting, as a relevant selection effect adds to the behavioral effect (see Section 4.3).

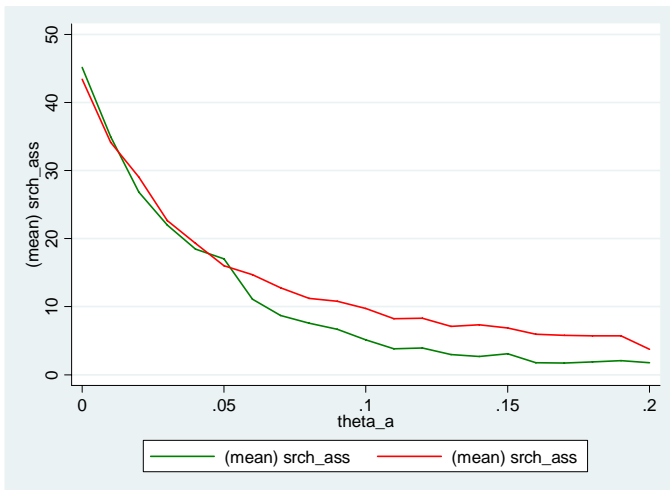


Figure 4. Search behavior among assisted with varying θ_A

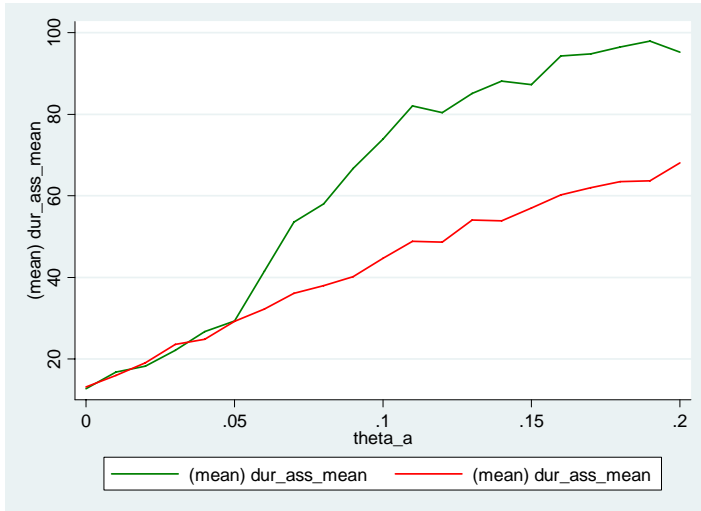


Figure 5. Welfare spell length with varying θ_A

The percentage of the eligible claiming the benefit is not affected by θ_A with weak forecasting; given the behavior of unemployment rates, also welfare participation rates rise with θ_A . On the other hand, since take-up rates fall and unemployment rates are reversed U-shaped, also the welfare caseload is non-monotonic with strong forecasting..

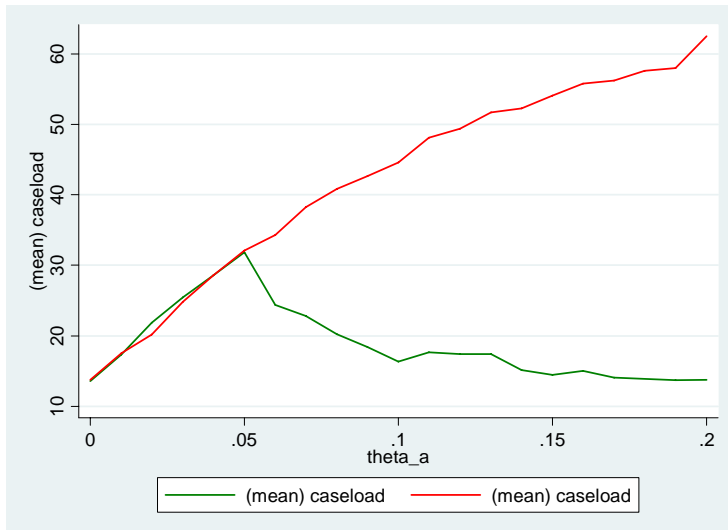


Figure 6. Welfare participation rates with varying θ_A

Overall, these results are consistent with the expected effects described in Section 4.3. The simulations reveal a non-monotonic pattern of the outcomes for which, with strong forecasting, the direction of the effect could not be predicted at the theoretical level. For weak forecasting, all relevant economic outcomes worsen as θ_A increases.

Effect of cognitive features

The differences regarding weak and strong forecasting are marked, and have already been highlighted. The behavior of the unemployment rate as h increases is depicted in Figure 7. As the individual capacity to look ahead augments, unemployment rates sharply go down. The reduction is even stronger if she correctly anticipates the detrimental effect of θ_A on employment prospects. Summing up these findings, the stronger the individual's forecasting skills, the better the overall economic outcomes. If we are willing to cast doubts on individuals' capability to evaluate future prospects, these results demonstrate that if we incorrectly assume perfect forecasting we are likely to make predictions which could be largely too optimistic.

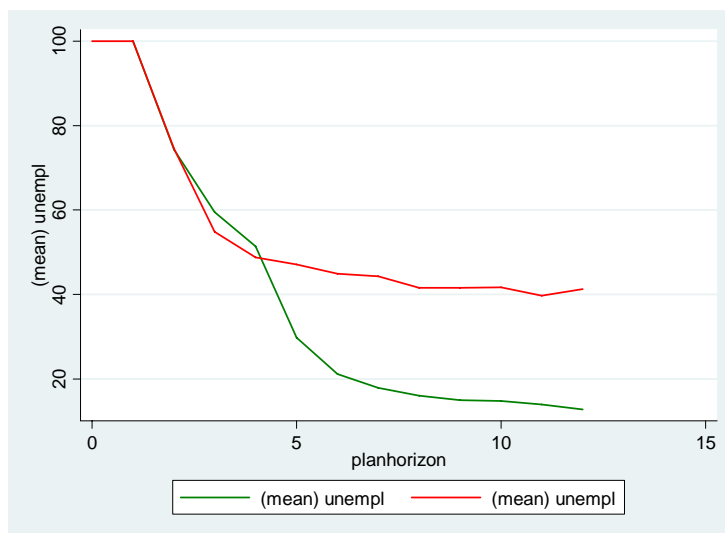


Figure 7. Unemployment rate with varying h

Rising stigma

We have analyzed so far the behavior of the economic outcomes of interest as each of the stigma components ϕ and θ_A varies while the other one remains fixed. Summing up the results on unemployment rates, if ϕ increases unemployment decreases, while if θ_A increases the pattern is more complex: rising rates with weak forecasting and reversed U-shaped with strong forecasting. However, *both* parameters are likely to be affected if the level of stigma changes, hence, the net effect on unemployment is a priori undetermined.

In this light, we have also carried out simulations where all combinations of (ϕ, θ_A) are considered. The surfaces in the tri-dimensional plots depicted in Figure 8 represent the unemployment rate for varying (ϕ, θ_A) . Our claim that unemployment rates do not necessarily go down with growing stigma is confirmed. Similar results also hold for welfare participation rates.

Summing up, this is our most relevant finding. The strengthening of stigma implies higher values of the utility component and/or the employability component of stigma. Whether unemployment rates rise or fall depends critically on the direction of the change and the former value of (ϕ, θ_A) .

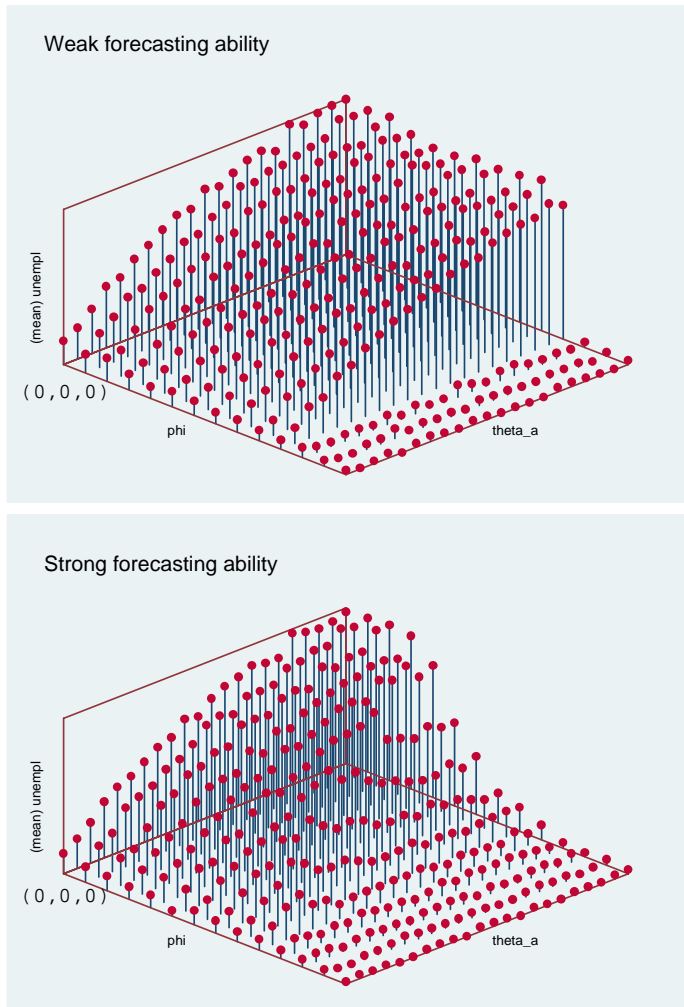


Figure 8. Unemployment rate with varying ϕ and θ_A by forecasting ability

6.2 Global analysis

In order to test whether the qualitative results of the sensitive analysis around the default configuration are of more general validity, we have performed a *global analysis* (Leombruni et al., 2005) of the relationship between the unemployment rate and the employability stigma parameter, θ_A . That is, we have run a high number of simulations with randomly extracted values of the relevant parameters, and for each configuration of parameters we have performed a sensitivity analysis by letting the value of θ_A systematically vary. The other parameters remain

fixed. The interval or value for each parameter is the same as in the sensitivity analysis (see Table 3). For each configuration, a population of $N = 1000$ individuals is created, and evolved from $t = 0$ to $t = 240$ ($2 * maxAge$). The average unemployment rate between $t = 120$ and $t = 240$ is then recorded.

Of course, for many random configurations the system remains stuck in a corner solution: nobody finds it convenient to engage in job search, and everybody remains unemployed. We have disregarded such configurations, and continued sampling until 100 valid configurations each are obtained, respectively with strong and weak forecasting.

Results, strong forecasting

In order to test the general existence of an inverse-U shaped relationship between θ_A and the unemployment rate, in the case of strong forecasting, we have fitted a second order polynomial on the artificial data resulting from each configuration we have tested. We focus on the sign of the second order coefficient, i.e. on the curvature of the parabola. A positive coefficient would undermine the general validity of our finding; on the other hand, a zero or not significantly different from zero coefficient would still be coherent with a inverse-U shaped relationship, since for particular values of the parameters the curve could be stretched out and appear as a straight line. The coefficient turns out to be negative and significant (at the 10% confidence level) in 43 out of 100 configurations, while it is positive and significant in only 2 configurations (Table 4). If the confidence level is raised to 5%, 34 configurations have negative and significant second order coefficients, while there are no configurations with positive and significant coefficient.

Table 4. *Global analysis: sign of the second order coefficient, strong forecasting*

<i>Coefficient</i>	<i>Number of configurations</i>
Negative and significant	43
Negative but not significant	40
Positive but not significant	15
Positive and significant	2
Total	100

Note: 10% confidence level

Figure 9 shows the relationship between θ_A and the unemployment rate for the 2 configurations where the sign of the second order coefficient is positive and significant (panel (a) and (b)), and for other two configurations where the sign is negative and significant (panel (c) and (d)).

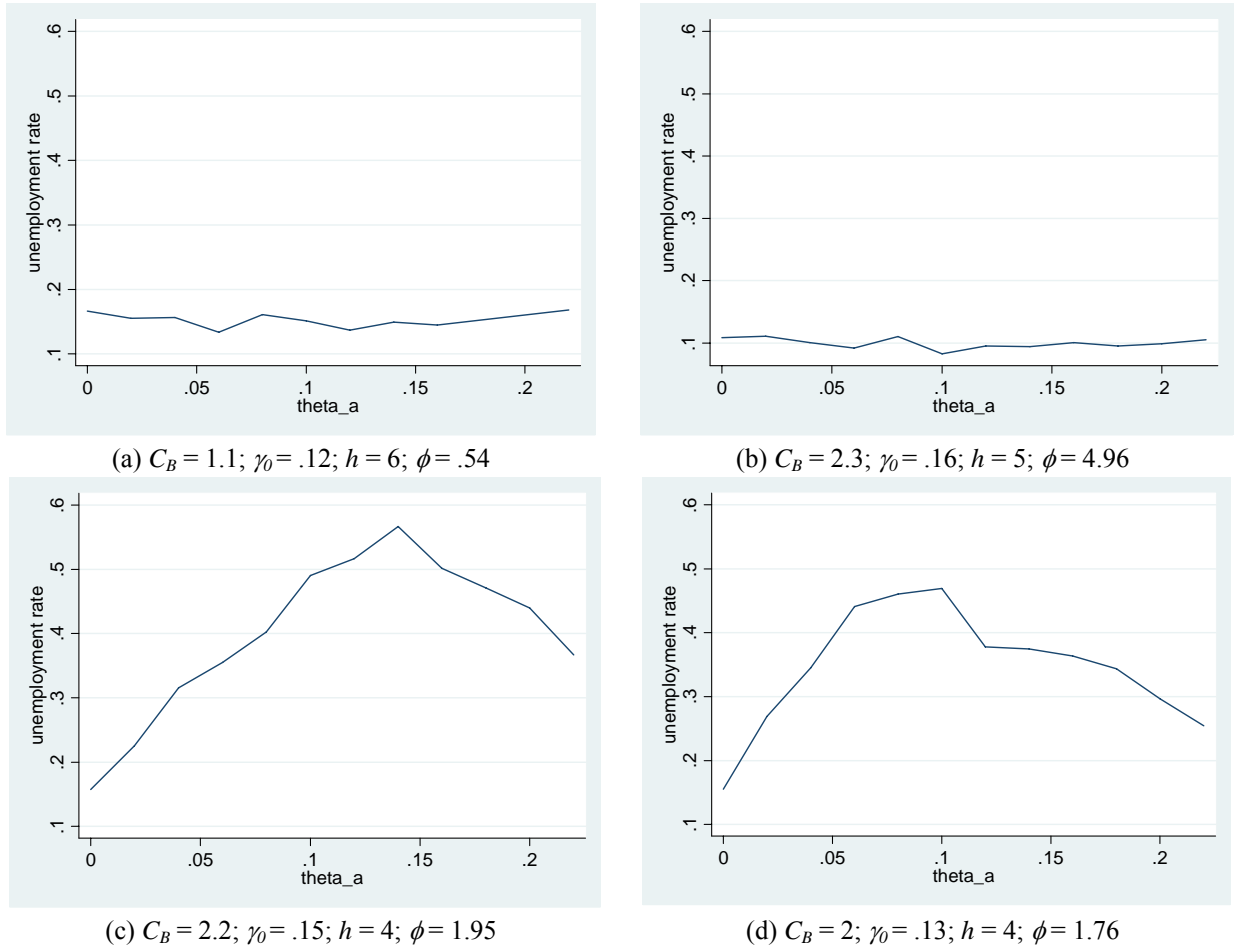


Figure 9. Effect of θ_A on unemployment, different configurations of the parameters.

In the two configurations of panel (a) and (b), the unemployment rate is almost constant as θ_A varies. The combination of parameters are such that θ_A appears to be almost non relevant, for the unemployment rate. This is confirmed by re-running the experiments and extending the range of variation of θ_A . Thus, these two configurations cannot be considered as a rejection of the general inverse-U shaped relationship between the employability stigma and the unemployment rate. Finally, among the 43 configurations with a negative and significant second order coefficient, the maximum of the parabola (the highest level of the unemployment rate) is found inside the sampled interval for θ_A in more than 60% of the cases; in all the others, the maximum is found for a level of θ_A above 0.2, which implies an observed increasing relationship between θ_A and unemployment.

Results, weak forecasting

In order to test the general existence of a positive relationship between θ_A and the unemployment rate, in the case of weak forecasting, we have fitted a linear model on the

artificial data resulting from each configuration we have tested. The sign of the first order coefficient is positive and significant in 60 out of 100 configurations, while it is negative and significant in only 2 configurations (Table 5)

Table 5. *Global analysis: sign of the θ_A coefficient, weak forecasting*

<i>Coefficient</i>	<i>Number of configurations</i>
Positive and significant	60
Positive but not significant	15
Negative but not significant	23
Negative and significant	2
Total	100

Note: 10% confidence level

Again, visual inspection of the two configurations with negative and significant coefficient shows a very small variation in the level of the unemployment rate. Moreover, the sign of the coefficient is not robust to additional runs of the experiments in the same configurations of the parameters.

We can thus conclude that our results are of general validity: the relationship between θ_A and unemployment is inverse-U shaped with strong forecasting, and monotonically increasing with weak forecasting.

7. Empirical evidence

The aim of this Section is to provide empirical evidence on the extent to which welfare stigma varies across countries and how stigma is related to unemployment and poverty rates. We will show that the level of stigma is related to welfare policies, and that it is positively correlated with unemployment and poverty, even after taking other institutional characteristics and features of the labor market under control. While not in line with the traditional models of welfare stigma, these findings are consistent with our theoretical model.

Income support: institutional features

We first briefly review the characteristics of income support policies across countries. Benefit provision is subject to different rules across countries. Unemployment Insurance is a temporary compensation for lost earnings, and eligibility is related to employment or contribution requirements. In some countries (such as France, Germany, Spain, UK) another form of unemployment compensation - Unemployment Assistance - is available when Unemployment

Insurance expires; work and contribution requirements are less stringent than for Unemployment Insurance, and claimants must be actively looking for work. Benefit levels depend on family income and are generally lower and less dependent on previous earnings. Social assistance is a last resort provision to secure a minimum standard of living for those who do not qualify or who are no longer eligible for Unemployment Insurance. Eligibility is subject to means testing: it does not depend on the claimant's work history; it is related to income and assets, and refers to household's resources. Benefits often "top up" income from other sources, and are set below the resulting poverty thresholds in most countries, although the level of the benefit varies greatly across countries¹⁰. As an incentive to enter paid employment, some countries allow to complement benefits with low paid work. Additional requirements such as looking for work, training or workfare activities apply in some countries. In Italy and Greece there is still no universal minimum income scheme for working age individuals [OECD, 2004].

Given that social assistance requires means tests while unemployment benefits are insurance based, it is likely that the latter are perceived more as a worker's right, we thus expect welfare stigma to be stronger for social assistance. Evidence on this topic is weak. Given that stigma is considered an important determinant of welfare participation, as a proxy we could look at take-up rates for the different programs. Reliable data on take-up rates is limited in most OECD countries: most of the evidence refers to the United Kingdom and the United States and is derived from empirical studies which differ both their approach and the benefits covered. Nonetheless, some broad results from Hernanz *et al.* (2004, pg 10) seem to support our claim: "[...] take-up levels of welfare benefits are often low across many countries and programs. This is particularly the case for (means-tested) social assistance, where most estimates are in a range between 40% and 80%. [...] Insurance-based unemployment benefits are less exposed to problems of non-take-up, and are typically collected by about 60% to 80% of those eligible" .

Measurement of welfare stigma

Little empirical evidence is available to measure welfare stigma. Some evidence on it stems from the cross-sectional World Values Survey¹¹, which provides harmonised questions on values and attitudes for an extensive set of countries at different times. The following question in particular appears to be directly related to welfare stigma: "*Do you agree with the following statement? It is humiliating to receive money without having to work for it*". Answers are coded from 1 (strongly disagree) to 5 (strongly agree). The higher the level of agreement, the stronger

¹⁰ Just to give an example, for a family with head, partner and two children, benefit varies from 71% of the average worker production wage in Denmark to 17% in the US

¹¹ www.worldvaluessurvey.org/

is the negative attitude towards welfare recipients, which at the collective level gives rise to stigma. Our measure of welfare stigma (Table 6) is the normalized country mean value. The index varies between 0, indicating no stigma (everybody strongly disagrees with the statement) and 1, indicating maximum stigma (everybody strongly agrees)¹².

Available data refers to year 1999, when the item was introduced in the questionnaire, and to year 2005, when the question was repeated for a subset of countries (Finland, Germany, Italy, Spain and Sweden). For these countries stigma appears to be quite stable over time, and within countries differences are much lower than those across-countries¹³ (the average within-country standard deviation of the stigma index, measuring time variability, is 0.010; the between-countries standard deviation is 0.075 for 1999 and 0.064 for 2005).

Table 6. *Index of stigma across selected European countries.*

Country	Stigma index 1999 ¹	Index rank 1999	Stigma index 2005	Welfare regime ²
Netherlands	0.411	14	-	Social Democrat
Finland	0.521	7	0.527	
Sweden	0.509	10	0.472	
Denmark	0.472	13	-	
Germany	0.503	12	0.525	Corporatist
Belgium	0.517	8	-	
Austria	0.512	9	-	
France	0.523	6	-	
Portugal	0.607	3	-	Mediterranean
Spain	0.532	5	0.535	
Greece	0.633	2	-	
Italy	0.702	1	0.665	
UK	0.504	11	-	Liberal
Ireland	0.562	4	-	

1. Year 2000 for Finland

2. According to the definitions of Esping-Andersen and Ferrera.

Stigma and welfare policy

¹² The concept of stigma differs substantially from that of civic attitudes. Algan and Cahuc (2006) measure civic attitudes from the WVS by referring to the question regarding the justifiability of claiming government benefits without having the right to do so. Another item related to civic attitudes is that regarding the justifiability of cheating on taxes. The correlation coefficient between the rankings of Algan and Cahuc's measure of civic attitudes and our measure of welfare stigma across the countries of Table 3 is -0.63. This evidence could be explained as follows: with strong civic attitudes a high cost is paid for being an undeserving claimant; if income support is perceived as a citizen's right and people take advantage of it only as long as it is really needed, without cheating or reducing search effort, no stigma should be attached to welfare participation.

¹³ Most of the cross-country differences are statistically significant at the level 0.01; within country differences are significant for only for Sweden and Italy.

The relationship between program design and stigma is highlighted by Besley and Coate (1992), (see Section 2). Their conclusion is that a rise in the benefit increases welfare stigma, and that targeting policies may improve to keep low the level of stigma, as only those perceived as deserving would receive the income support. On a different perspective, Saraceno (2002) argues that both the demographic and social profiles of income support beneficiaries and their pattern of welfare participation are highly dependent on how welfare systems ‘construct’ and select social assistance recipients, and that these factors affect the process by which individuals become poor or social excluded. She concludes – differently from Besley and Coate – that universalistic (and more generous) welfare policies are likely to lower welfare stigma.

Going back to Table 6, we see that Southern European countries rank highest, Denmark and Netherlands (and also Sweden in 2005) rank lowest, while continental countries and Finland, Great Britain and Ireland, exhibiting similar values, are in between. The ranking seems to be related to the welfare regime: stigma is highest in the countries belonging to the Mediterranean-residual welfare regime, in particular in Italy and Greece, where no minimum income scheme exists. It is generally much lower in Social Democrat regime countries, and also in Germany, where the minimum income scheme has a long-standing tradition. Thus, stigma seems to be weaker where benefits are generous and the welfare system has a universalistic character, while it is stronger where income support is low and benefit provision categorized (OECD 2004; Saraceno 2002).

Stigma, unemployment and poverty

The level of stigma is positively related to poverty and unemployment rates (Table 7). Correlation at the cross-sectional level is always positive and varies between 0.5 and 0.7, the correlation with poverty being higher than that with unemployment. There is a positive association also at the within country level, although variations over time can be evaluated only for the countries for which data on stigma is available for 2005. As highlighted before, this piece of evidence is *not* in line with the classical models of welfare stigma, according to which the stronger stigma, the lower unemployment and poverty rates¹⁴.

¹⁴ In the table we look at country unemployment rates as reported by the official statistics, whereas our model refers only to ‘weak’ individuals: accordingly, the unemployment rates reported in Section 6 represent the percentage of unemployed within this segment of the society. In this light, the comparison between simulated and real data is not strictly coherent. Nonetheless, even if we believe that the comparisons regarding poverty and long term poverty are more appropriate, we find the empirical evidence for unemployment interesting, and worth being reported.

Table 7. *Correlation between welfare stigma and unemployment, poverty and long-term poverty¹*

	(1)	(2)	(3)	(4)
	UNEMPLOYMENT	POVERTY (EUROSTAT)	POVERTY (OECD)	LONG-TERM POVERTY
$\rho(Y_{99}, S_{99})^2$	0.503	0.663	0.632	0.695
$\rho(Y_{05}-Y_{99}, S_{05}-S_{99})^3$	0.372	- ⁴	0.588	- ⁵

1. Sources: Col (1) OECD <http://stats.oecd.org>; Col (2) EUROSTAT, <http://epp.eurostat.ec.europa.eu>; Col (3): OECD; Col (4) EUROSTAT
2. All countries in Table 1, Col (3) UK excluded, no data available for 1999; Col (4) Denmark and Sweden excluded, no data available for 1999
3. Five countries (Italy, Spain, Sweden, Finland, Germany)
4. The reported poverty-rate changes uniformly for the four countries for which data is available
5. No available data for long-term poverty in 2005

Multivariate analysis

The positive correlation between the economic outcomes unemployment, poverty, long-term poverty rates and welfare stigma cannot be unambiguously interpreted in causal terms. Our claim is that the level of stigma directly affects unemployment and poverty (recall that in our simple model the two situations overlap); nevertheless, we cannot rule out reverse causation. Besley and Coate (1992) for example claim that the level of stigma decreases if welfare recipients are perceived as ‘deserving’ (note however that if in the low phases of the business cycle unemployment rises and people are laid off, at least at the within country level their theory should predict a negative correlation between unemployment rates and stigma).

Given this potential simultaneity, disentangling the direct and feedback effects between these variables is not an easy task. Good theory and good longitudinal data are required. Good theory, because unemployment and poverty depend on institutional factors and market features in potentially complex ways. Moreover, if our claim that welfare stigma affects unemployment/poverty is true, the issue is to determine the correct time lag. The same problem holds for the potential feedback effect of unemployment/poverty on the level of stigma (in this respect, recall that according to the evidence derived from the WVS, the level of welfare stigma changes little over time). As regards data, the main problem is that evidence on welfare stigma is available only for one-two points in time.

These remarks notwithstanding, a descriptive empirical assessment of the relation between welfare stigma and unemployment and poverty at a multivariate level can be carried out. We estimate a panel data model for unemployment, poverty and long-term poverty rates employing the stigma index derived above and a set of explanatory variables describing institutional and labor market features at the country level. We consider the time interval 1999-2005, in order to

stick to the period for which data on welfare stigma is available. For the countries with 1999 and 2005 data, the variable STIGMA is defined by linear interpolation for the years in between; for the other countries, we consider the 1999 value throughout the whole period. The model is:

$$y_{it} = \mu_i + \beta s_{it} + \gamma_1 x_{1it} + \gamma_2 x_{2it} + \dots \gamma_k x_{kit} + \varepsilon_{it} \quad i=1..n, t=1..T$$

where y represents in term unemployment, poverty and long-term poverty rates for country i in year t , s is STIGMA as defined above, and the x 's are the control variables. Errors are i.i.d. across time and countries, while the within country correlation over time is captured by the country-specific intercept μ_i .

The set of control variables is largely drawn on Scarpetta (1996), who models unemployment rates for the years 1983-93¹⁵. We take into consideration only the variables which he finds to be statistically significant; we now briefly describe them (but for a deeper discussion of the rationale underlying their inclusion and expected effects, see his paper):

- Active labor market policies (training programs, job-search counseling, job-brokerage services and subsidized employment). By raising the search effectiveness of job seekers these policies are expected to lead to shorter unemployment spells; on the other hand the existence of generous active programs may raise wage pressure, pushing upwards the duration of unemployment. The government's commitment to active labor market policy is proxied by expenditure on active measures per unemployed person relative to output per capita (ALMPU)¹⁶;
- Unemployment benefits may be expected to raise beneficiaries' reservation wages, reducing their search efforts and their willingness to accept job offers. On the other hand, as highlighted by Scarpetta, unemployment benefits act as a subsidy to job search, contributing to better job matching and, thus, may lower unemployment. The index we employ is based on a simple average of gross replacement rates for individuals with different durations of the unemployment spell, different levels of earnings and different family situations (UB)¹⁷;

¹⁵ Interestingly enough, the results of Scarpetta (1996) can be nearly reproduced for the period 1983-93, by employing the same set of explanatory variables (mild discrepancies can be attributed to a recent change in the definition of EPL). On the other hand, if we estimate the same model for the period 1999-2005 (without stigma as a dependent variable), many variables are no longer statistically significant.

¹⁶ Source: <http://stats.oecd.org>.

¹⁷ Source: OECD, Tax-Benefit Models. www.oecd.org/els/social/workincentives

- In order to account for the income support for long term unemployment, differently from Scarpetta, we also include a measure of the out of work benefits (OUT)¹⁸, the average of net replacement rates over 60 months of unemployment (provided by unemployment benefits plus additional social assistance) in percent of earnings level;
- The freedom of firms to hire and fire workers is often limited by employment protection regulations (EPL). These regulations are likely to operate in two directions. They may reduce arbitrary dismissals, lower contracting costs by setting general rules and standards, encourage on-the-job training and human capital formation. On the other hand, firms may become cautious in hiring, or prefer part-time and temporary labor contracts which offer them more work force flexibility. The measure is calculated as a weighted average of the index for regular employment and the index for temporary employment¹⁹;
- The wage bargaining process can play an important role in determining labor market conditions. One common indicator of the character of industrial relations is union density (UDENS) measured by the proportion of workers who are members of trade unions²⁰; another indicator is given by the degree of coordination (COOR), the extent to which decisions taken by trade unions and employers' associations are concerted²¹. Union density and coordination might lead to higher wages and thus higher unemployment rates, although they could also be an indicator of how the overall conditions of the labor market are taken into account in the wage setting process, which might help to keep low the incidence of working poor;
- At any point in time, countries can differ in their relative position in the business cycle. To account for these factors, the output gap (GAP), the percentage difference between actual and the long-run trend output is employed²².
- In the poverty equations, we also include a measure of social spending (SOCIAL_GDP) defined in the *OECD Social Expenditure Database* (OECD, 2007) under the heading "Other social policy areas"²³.

¹⁸ Source: OECD, Benefit and Wages: Main tax benefit indicators, www.oecd.org/els/social/workincentives

¹⁹ Source for EPL: OECD, Employment Data, Employment protection legislation, labour market programmes and union membership, Time series of EPL changes (1985-2003), OECD Employment Outlook (2004). Source for (permanent/dependent) and (temporary/dependent): OECD, <http://stats.oecd.org>.

²⁰ Source: OECD, Employment Data, Employment protection legislation, labour market programmes and union membership, Union members and employees, <http://stats.oecd.org>

²¹ The indicator is the sum of the union coordination index and the employer coordination index. Source: Nickell (1998), *The Economic Journal*, 108, 802-816.

²² As argued by Scarpetta the output gap measure is not an exogenous variable, although it is reasonable to assume that it is economically predetermined (changes in the cycle drive changes in unemployment and not vice versa). Source: OECD, Economic Outlook No 83, June 2008, Annual Projections for OECD Countries <http://stats.oecd.org>.

We use similar variables for the unemployment and poverty equations. Our argument is that poverty is (mainly) due to lack of work; thus we expect poverty rates to be driven up and down by much the same factors that affect unemployment. However, given that the number of countries and time series length are small, to keep the number of control variables low we have excluded GAP and UDENS for the poverty equations, as they are likely to affect poverty only in the long run, and UB, having privileged the replacement rate for long-term unemployment OUT and SOCIAL_GDP.

Four different estimation methods are employed. (i) The *fixed effect* model takes the country-specific intercepts μ_i 's as nuisance parameters, possibly correlated with the explanatory variables. The method exploits only the within-country variability, thus time constant variable coefficients are not identified and dropped from the analysis. Given the limited time variability of STIGMA the corresponding estimate is not very efficient; (ii) The *between groups* estimator exploits instead only the between country variation in the explanatory variables (it corresponds to OLS applied to the over time average country equation); (iii) The *random effect* model takes the country-specific intercepts μ_i 's as realizations of a random variable with a normal distribution, and requires the additional assumption that this variable and the explanatory variables are independent. The GLS estimator is a weighted average of the fixed effect and between groups estimators (Hsiao, 2000). We also estimate (iv) a *cross-sectional* model for year 1999. Its obvious limit is that it exploits only the between country variability for that year (with a consequential very low sample size); on the other hand since the stigma index refers for most countries precisely to that year, measurement error is kept as low as possible.

Results are summarized in Table 8 for each economic outcome²⁴. Two sets of regressions were run, one with all the variables described above [column (1)], the other including only the variables turning out to be significant in at least one model [column (2)]²⁵.

The coefficient of welfare stigma is *positive* and statistically significant in most specifications; in the few cases where it is negative, it is not significant. The stigma coefficient is always positive and significant in the long-term poverty models. In the models for poverty rates

²³ Source: OECD, the Social Expenditure Database (SOCX), <http://stats.oecd.org>. The OECD Social Expenditure Database groups benefits with a social purpose in 9 policy areas: old-age, survivors, incapacity-related, health, family, active labour market policies, unemployment, housing, other social policy areas. The latter include non-categorical cash benefits to low-income households, other social services. We consider the index given by the social spending at constant prices 2000/GDP at prices 2000*100.

²⁴ Goodness of fit tests are summarised at the bottom of each panel, under the heading "Fit". The hypothesis system is the conventional one for regression models (all explanatory variables coefficients are zero under the null hypothesis, at least one of them is different from zero in the alternative one). The Wald test is reported for the random effects model, while the F test for the other ones. Within and the between groups R^2 are also reported for panel data models, and the standard R^2 for the cross-sectional model in the last columns.

²⁵ The coefficient of COOR cannot be estimated in the fixed effect model because there is only one observation for the whole period, and thus it is taken as time invariant.

the between country variability is responsible for the positive sign (the coefficient is positive and significant with the between effects estimation method and in the cross-section for year 2000; while it is negative in the fixed effect model). On the other hand, it is the within country variability in the stigma index which is responsible for the positive sign in the unemployment models. The reasons underlying these results, beyond the scope of the present work, should be the object of further investigation.

In conclusion, the finding of main interest is that unemployment/poverty and welfare stigma are *not* negatively correlated as predicted by the traditional models on welfare stigma, even when institutional and labor market features are kept under control. On the other hand, these findings, although not necessarily conclusive, are consistent with our model.

Table 8. Poverty rates, long-term poverty rates, unemployment rates

Panel a. Poverty rates (1999-2005)								
	<i>random effects</i>		<i>Fixed effects</i>		<i>between groups</i>		<i>year 1999</i>	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
STIGMA	9.03	21.95**	-19.50	-26.92	44.583*	30.90**	49.22*	49.22*
SOCIAL_GDP	-1.83		-3.30		-3.048		-5.474	-5.474
ALMPU	-0.007		-0.007		0.020		0.018	0.018
OUT	-0.040		-0.037		0.061		0.112	0.112
COOR	-1.84**	-2.10**	-	-	-1.890**	-1.99**	-2.032**	-2.032**
Constant	21.37**	11.95**	29.13**	28.96**	-4.474	6.786	-8.73	-8.73
Fit (1) 88 observ 13 countries	Wald-chi2(5)=52.20 p-value=0.0000 R ² w=0.057 b=0.808		F(1,74)=1.89 p-value=0.1213 R ² w=0.096 b=0.065		F(5,7)=11.02 p-value=0.0033 R ² w=0.062 b=0.887		F(5,7)=10.44 p-value=0.0038 R ² =0.882	
Fit (2) 88 observ 13 countries	Wald-chi2(2)=54.10 p-value=0.0000 R ² w=0.033 b=0.854		F(4,71)=2.51 p-value=0.1175 R ² w=0.033 b=0.442		F(2,10)=33.46 p-value=0.0000 R ² w=0.033 b=0.870		F(2,10)=26.63 p-value=0.0001 R ² =0.842	

Panel b. Long-term poverty rates (1999-2003)								
	<i>random effects</i>		<i>Fixed effects</i>		<i>between groups</i>		<i>year 1999</i>	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
STIGMA	35.61**	27.89**	119.99*	125.7**	44.63*	25.76**	46.87**	25.82**
SOCIAL_GDP	-2.41		-4.95		-2.95		-11.31*	
ALMPU	0.007		-0.004		0.014		0.022	
OUT	0.050		-0.013		0.092		0.115*	
COOR	-1.11**	-1.196**	-	-	-1.142*	-1.202**	-1.239*	-1.465**
Constant	-7.880	-0.892	-52.02	-57.54*	-15.24	0.279	-17.67	1.07
Fit (1) 39 observ 12 countries	Wald-chi2(2)=33.61 p-value=0.0000 R ² w=0.108 b=0.838		F(4,23)=1.96 p-value=0.134 R ² w=0.255 b=0.554		F(5,6)=7.14 p-value=0.0165 R ² w=0.072 b=0.856		F(5,5)=14.00 p-value=0.0058 R-sq=0.933	
Fit (2) 39 observ 12 countries	Wald-chi2(5)=37.08 p-value=0.0000 R ² w=0.228 b=0.790		F(1,26)=7.68 p-value=0.010 R ² w=0.228 b=0.512		F(2,9)=17.07 p-value=0.0009 R ² w=0.228 b=0.791		F(2,8)=13.84 p-value=0.0025 R ² =0.776	

Panel c. Unemployment rates (1999-2005)								
	<i>random effects</i>		<i>fixed effects</i>		<i>between groups</i>		<i>year 1999</i>	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
STIGMA	14.76	16.78*	101.24**	49.87**	-59.27	7.71	-88.56	10.84
ALMPU	-0.026*	-0.026**	-0.023*	-0.03**	-0.096	-0.030	-0.121*	-0.020
GAP	-0.295*	-0.171**	-0.31**	-0.16**	0.263	-1.650*	0.939	-1.093
UB	0.019		-0.055		0.149		0.184*	
OUT	-0.015		-0.028		-0.183		-0.286*	
UDENS	0.018		0.218		0.040		0.076	
COOR	-0.025		-		0.220		0.306	
Constant	0.473	-0.491	-50.04**	-17.79*	46.90	4.97	65.29*	4.53
Fit (1) 88 observ 13 countries	Wald-chi2(7)=20.01 p-value=0.0056 R ² w=0.344 b=0.423		F(6,25)=7.80 p-value=0.0001 R ² w=0.652 b=0.129		F(7,5)=2.67 p-value=0.1483 R ² w=0.014 b=0.789		F(7,5)=4.93 p-value=0.0489 R-sq=0.873	
Fit (2) 88 observ 13 countries	Wald-chi2(3)=57.88 p-value=0.0000 R ² w=0.423 b=0.314		F(3,75)=22.03 p-value=0.0000 R ² w=0.468 b=0.244		F(3,9)=4.16 p-value=0.0418 R ² w=0.268 b=0.581		F(3,9)=4.85 p-value=0.0283 R-sq=0.617	

8. Concluding remarks

Low take-up rates of welfare benefits may be a cause of concern for policy makers, as they reduce the probability that welfare programs attain their goal of reducing poverty (Hernanz *et al.* 2004). Welfare take-up rates are shown to be negatively affected by stigma. According to traditional job-search models, however, also unemployment rates tend to decrease with stigma. Hence, although from the former perspective stigma is considered “a bad”, from the point of view of unemployment reduction it may be considered “a good”.

This mainstream conclusion no longer holds if the stigma attached to receiving the benefit, in addition to representing a cost of welfare participation, also entails a reduction of search effectiveness. Under this more comprehensive model unemployment rates are non-monotonically related to stigma. If the assumption that individual employment prospects are not affected by social disqualification appears too strict, we should acknowledge that stigma may well lead to *higher* unemployment and poverty rates.

The role of forecasting capacity is also investigated. We let individuals evaluate the future value of their alternative options by looking ahead for varying periods of time, and compare the situations where individuals forecast the future loss of employability triggered by welfare stigma and where they do not. Incorrectly assuming perfect forecasting ability leads to systematic underestimation of the effects of welfare stigma on unemployment and poverty rates.

Differently from traditional job-search models, our model is consistent with the empirical evidence: unemployment and poverty rates are generally higher with stronger stigma. The positive relation still holds when country institutional and labor market features are controlled for within a multivariate panel data regression model.

Also note that job-search models unambiguously predict that unemployment rates rise with the level and the duration of the benefit. Nonetheless unemployment rates (together with poverty rates and persistence of poverty indicators) are lower in Northern European countries than in the South, despite the fact that social assistance and unemployment benefits are far more generous there. Since stigma is weaker in the North, this inconsistency may be solved within the model proposed, if we are located on a positively sloped branch of the stigma-unemployment curve (see Figure 10).

Our findings suggest that stigma may entail no positive drawbacks, although their relevance in terms of policy implications should be the object of further work. Deeper knowledge on how welfare stigma is generated should be acquired in order to contrast it effectively.

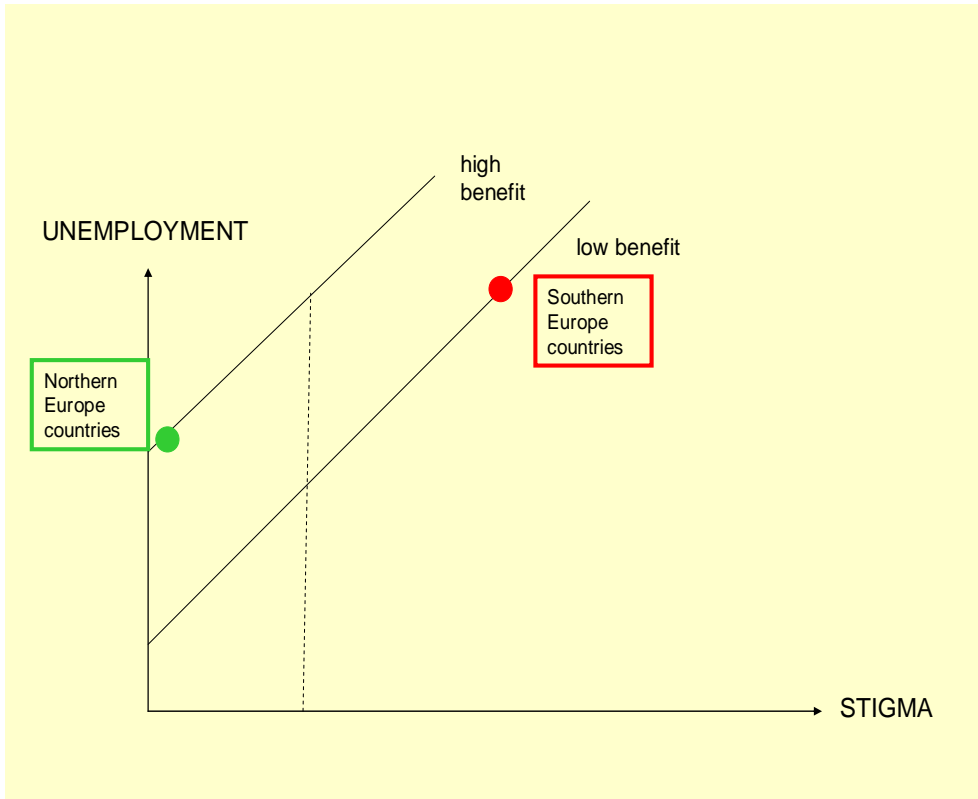


Figure 10. Model implications

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