'PROPOSAL DESCRIPTION – CALL 2020-2021'

BRAIN-BE 2.0 – BELGIAN RESEARCH ACTION THROUGH INTERDISCIPLINARY NETWORKS (2018 -2023)

(Compulsory document – must be completed)

*Before completing, please read carefully the **Information File Call 2020-2021,** the **Submission and Evaluation Guidelines and the Budget rules**. Do not forget to use the **Gender Checklist** to take into account all the gender aspects throughout the proposal.*

PILLAR, TYPE OF PROJECT AND RESEARCH PRIORITY	
Choose one Pillar:	☐ Pillar 1 ☐ Pillar 2 ☒ Pillar 3
Choose one type of project:	☒ National Thematic project ☐ Bottom-up project
If your project is a National Thematic project, provide the research priority/ies:	[2.] SOCIETAL SHOCKS, BETWEEN (R)EVOLUTION AND SOCIETAL RESILIENCE

PROPOSAL's ID	
Project Acronym	BESWEP
Project Title	The Belgian Short-time Work scheme: Economic and Psychological Impacts

Please note that the font used to complete the documents must be Calibri, size 11, with 1.15 line spacing.

0. SCOPE

I. COMPLIANCE WITH THE SCOPE OF THE CALL (max. 0.5 pages)

This research studies the impact of the Belgian short-time work (STW) compensation scheme (known as "*temporary unemployment*" in Belgium) on economic and psychological outcomes *in the short and longer term*. STW is a policy instrument installed *at the federal level* to avoid the costly process of separation and re-hiring during the temporary reduction in production and demand and may thereby also avoid the bankruptcy of firms. From the employees' perspective it avoids the social cost of unemployment and reintegration into the labour market.

STW has had particular resonance during the *COVID-19 pandemic*. At the peak of the lockdown in April 2020, as many as 1.167 million people - about 30% of eligible employees - benefited from a Corona version of STW for at least one day. As highlighted in the Call for proposal, it is of *high policy relevance to investigate the short- and medium-term consequences* of STW on the labour market given the substantial public expenditure implications. Future *reforms of the policy* need to build on *sound scientific evidence* of the factors for success of STW arrangements as response to cyclical fluctuations.

The proposal will mobilize *two disciplines* (economics and psychology). We will look at similar research questions, yet from a different angle, with the focus in psychological research being how STW is appraised rather than intended or implemented. The research will imply *cooperation* between research partners of different communities and universities in Belgium. The team is well balanced in terms of gender and expertise. The economists Bart Cockx (UGent) and Muriel Dejemeppe (UCLouvain) are renown experts in the field of the evaluation of labour market policies. The psychologists Nele De Cuyper and Hans De Witte (KULeuven) and Florence Stinglhamber (UCLouvain) are renown experts in different disciplines of work and organisational psychology, including occupational health psychology, personnel psychology and career research. Beyond mobilizing two scientific disciplines to analyse the efficiency of STW arrangements, the project will address some specific research questions *through a mixed methods study*. In particular, to investigate the effect of the Corona STW scheme on the career prospects of the targeted employees from a broad perspective, both micro-econometric evaluation methods using register files and longitudinal cross-lagged surveys will be implemented. Their results will be thoroughly compared and discussed.

1. IMPACT OVERVIEW

1.1. Position of the project in terms of impact

I. TABLE I: POSITION OF THE PROJECT REGARDING THE STATE OF THE ART

Position of the project regarding the state of the art…	Within	Beyond / Innovative
… in terms of topic	☒	☒
… in terms of methodology	☒	☐

Position of the project regarding…	Within	Beyond / Innovative
…Strategic scientific objectives of the FSI(s)	☐	☐

II. TABLE II: POSITION OF THE PROJECT IN TERMS OF ITS FORESEEN IMPACT

Targeted impact in the domain(s) of…	Not relevant	Minor	Moderate	Strong	Major
Scientific knowledge, future capacities and skills	☐	☐	☐	☐	☒
Economy	☐	☐	☐	☐	☒
Civil society	☐	☐	☐	☒	☐
Culture and Heritage	☒	☐	☐	☐	☐
Policy and public services	☐	☐	☐	☐	☒
Environment, Health and quality of life	☐	☐	☐	☒	☐
Collection management and conservation	☒	☐	☐	☐	☐

1.2. Position of the project with respect to its impact (max. 0.5 pages)

By directly analysing the effectiveness of a policy measure that has never been evaluated in the Belgian context, this research project has obvious relevance for decision makers, other stakeholders (e.g., the National Employment Office, employers' and workers' representatives) and society as a whole. A very large number of employees benefited from Corona short-time working arrangements during the crisis, supported by considerable public resources. By providing scientific evidence on potential benefits and risks associated with STW our research contributes to the debate on whether this form of support of businesses and workers in times of crisis is effective from both an economic and psychological point of view. Furthermore, by interpreting our findings in connection with the international scientific evidence, the decision maker is not only informed about the effectiveness of the Belgian version of the scheme, but also about the implications of a particular policy design. Both national and international evidence helps to move beyond the ideological debate, and facilitates democratic decision making.

In the research we aim at a balanced view on the measured impacts and processes. The employment outcome - having a job or not - has received much attention in the economic literature on STW. Though extremely important, this neglects the quality of employment (e.g., the level of earnings or the degree of job security), the quality of employment relationships (e.g., organisational support versus dehumanization), outcomes associated with sustainable careers, and ultimately worker well-being. Drawing on this, the project will explore a gap in international scientific evidence on the effectiveness of STW schemes by combining economic evaluations of the policy with the assessment of its psychological impacts. The psychological view will imply some level of innovation in producing new data in the form of longitudinal follow-up surveys for workers who have experienced STW in comparison to non-impacted workers or comparable unemployed individuals and temporary workers.

2. RESEARCH DESCRIPTION

2.1. Objectives and state of the art (max. 3 pages without references)

I. RESEARCH OBJECTIVES AND STATE OF THE ART

This research studies the impact of the Belgian short-time work (STW) compensation scheme (known as "temporary unemployment" in Belgium) on economic and psychological outcomes. Our main objective is to assess the effectiveness of STW from both an economic and a psychological perspective. Most of the existing body of evidence on the effectiveness of STW relies on economic studies. We are aware of one recent paper that relates the positive effect of STW on firm profitability in Japan to the psychological concept of "shared adversity" (Kato and Kadoma, 2019). By promoting work-sharing in recession, STW would facilitate team cohesion and strengthen employer organisational commitment. Still, this "shared adversity" is assumed, and yet not tested. The proposal consists of three parts: the micro-econometric evaluations of STW on various firm and employee outcomes (**Part A**), the impact of STW on worker attitudes, well-being and careers from a psychological perspective (**Part B**), and policy guidelines from an integrated perspective (**Part C**). The research objectives are translated into **five research questions**.

Part A. Micro-econometric evaluations of STW on various firm and employee outcomes

Research question 1 (RQ1): The effect of STW on employment and firm survival both pre- and post-Corona periods. We are not aware of any such evaluation study in Belgium. Struyven et al. (2017) and

Vandekerkhove et al. (2020) analyse the consequences of STW during the 2008-2009 and the recent Corona recession, but from a descriptive perspective, rather than evaluative. Although the Great Recession of 2008 triggered a resurgence of STW and a renaissance of international research on the effectiveness of this scheme in saving jobs, the survey of Cahuc (2019, p. 9) recognizes that "much remains unknown about the impact of short-time work compensation on employment" and that "empirical studies relying on firm data do not yet provide clear-cut results". Exploiting data collected at the company level, recent studies provide new insights on the impact of STW on employment and firm survival (Cahuc et al., 2018; Gehrke and Hochmuth, 2018; Guipponi and Landais, 2020; Kopp and Siegenthaler, 2019; Tracey and Polachek, 2018). Their findings all point in the same direction: STW has large and positive effects on employment when firms or the economy as a whole face a deep negative shock, but not in the case of smaller shocks or a more persistent recession. In the latter context, STW has a negative reallocation effect "which distorts employment towards low productivity firms rather than high productivity firms" (Guipponi and Landais, 2020, p. 84). STW is also shown to increase firm survival. There is some evidence that this effect is concentrated on firms with pre-crisis liquidity constraints or highly levered (Cahuc et al., 2018).

Research question 2 (**RQ2**): **The dynamic impact of STW on individual labour market outcomes**. We will evaluate the relative success of the COVID-19 version of STW on employment probabilities, working hours and total income (distinguishing earnings and transfers). We will pay specific attention to the heterogeneity of the effect across workers, with a special focus on women and youths, two groups that were severely affected by the crisis (CSE, 2020; OECD, 2020), and across time (short and medium run). The impact of STW on the labour trajectories of workers has received little attention in the economic literature. To the best of our knowledge, Guipponi and Landais (2020) are the only researchers who, based on Italian individual data, contrast the dynamics of labour outcomes between employees who accessed STW and comparison groups of similar workers employed in firms not eligible for this scheme or experiencing a layoff from such a firm. Concerning the latter comparison, they find, for instance, that STW treated workers have in the short run a much larger probability of employment, but as soon as the STW arrangement is over, this difference gradually disappears, suggesting that STW offers short-term insurance only.

Research question 3 (**RQ3**): **The effectiveness of experience rating in STW**. We will evaluate the effectiveness of taxing firms for *over*using the STW compensation scheme, i.e. of "experience rating" the contributions firms have to pay. In Belgium such experience rating has been introduced by the "Responsibility Contribution" in 2005 in the STW regime for blue-collar workers in the construction sector, generalized to other sectors in 2012 and thoroughly reinforced in 2017. While the effectiveness of experience rating in regular unemployment insurance has been studied (for an overview see Guo and Johnston, 2020), we are not aware of any empirical study that evaluates this within STW compensation schemes. The optimal level and form of the experience rating cannot be determined by empirical analysis alone. They require developing a theoretical model that mimics the main features of the responsibility tax and that will be used to simulate counterfactual systems. Although experience rating in standard unemployment insurance has been amply covered in the literature since the seminal paper of Feldstein (1976), it has hardly been discussed in the context of STW arrangements. On this subject, the literature has focussed on theoretical questions (Braun and Brügemann, 2017; Burdett and Wright, 1989; Cahuc et al., 2018; Cahuc and Nevoux, 2019).

Part B. Impact of STW on worker attitudes, well-being and careers: A psychological perspective

Psychological studies about STW are virtually non-existent. This is both surprising and unfortunate. It is surprising given that work and organisational psychologists have a long tradition in studying flexible forms of employment (De Cuyper et al., 2008) and unemployment (Paul and Moser, 2009). It is unfortunate, as it could bring potential benefits but also unintended risks to the fore that go unnoticed or that are only

assumed in an economic analysis. Those benefits and risks relate to how STW is appraised by workers rather than how it is intended or implemented by policy-makers and employers. We formulate two research questions connected to RQ1 and RQ2, respectively.

Research question 4 (RQ4) concerns **the extent to which STW has a positive or negative impact on worker attitudes and well-being** (relative to workers who are not affected). This is important as demotivation and strain are extremely costly for individuals, organisations and society alike, as illustrated in the massive attention to the costs associated with burnout (Eurofound, 2008). The intention behind the implementation of STW is securing jobs and firm survival. Yet, little if anything is known about how workers appraise the use of the STW scheme. **On the one hand**, workers may feel grateful that their jobs are secured (Kato and Kodama, 2019), and they may perceive STW as a signal that the employer cares about their well-being and values their contributions. In line with social exchange theory (Blau, 1964), they reciprocate by favourable attitudes to the organisation, for example expressing commitment. **On the other hand,** saving jobs through STW automatically implies that jobs were at risk: this could induce a sense of job insecurity among workers. Furthermore, STW could be perceived as prioritizing company profit by treating workers as instruments that can be easily disposed, coined "organisational dehumanization" (Bell and Khoury, 2016). Research has convincingly shown that feeling insecure or dehumanized has negative effects (e.g., Caesens et al., 2017; De Witte et al., 2016). Our **objective** is to test these seemingly conflicting views, i.e. the bright and dark sides of STW in terms of workers' attitudes and well-being. Our hypothesis is that the bright and dark side is conditional on situational factors (e.g., duration and type of STW) and workers' previous experiences (e.g., repeated use of STW, ongoing change in the organisation).

Research question 5 (RQ5) probes **the impact of STW on individual careers**, in particular the worker's feeling of being employable. Perceived employability is critical in crafting a sustainable career (e.g., De Vos et al., 2020): it facilitates career success and reduces career insecurity. Yet, barely nothing is known about how STW is appraised and affects career-related matters. **On the one hand**, STW is designed to avoid career disruptions, such as unemployment or cycling between temporary jobs. A plausible assumption then is that workers affected by STW fare relatively well in comparison to workers entering regular unemployment insurance and temporary workers: they may feel more employable in the short term and more successful and less insecure in the longer term. **On the other hand,** STW for some workers may come as a career shock. A career shock is disruptive and triggers a deliberate thought process (Akkermans et al., 2020). Being in STW may trigger such reflection and may easily lead workers to think that careers are vulnerable and only to some extent makeable: this could negatively affect their feeling of being employable and career success, and trigger career insecurity. Our **objective** is twofold. First, we will compare workers in STW, unemployment and temporary employment on perceived employability and career success and insecurity (**RQ5a**). Second, we will study perceived employability of workers on STW over time (**RQ5b**). Our hypothesis is that career prospects are conditional upon type of STW (e.g., COVID versus non-COVID) and aspects that make workers potentially more vulnerable in the labour market (e.g., gender and age).

Part C. Lessons for the design of STW scheme in Belgium

In Part A and Part B of the research proposal, we look at similar questions from a different perspective. In this part we will aim at **bringing together** the findings from the two disciplines and the existing literature as to obtain a coherent interpretable story for the findings. Based on this integrated view, we will formulate guidelines for the design of STW policy in Belgium, with a particular concern for their implications for women and other disadvantaged groups, such as youth.

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II. SCIENTIFIC RISK OF THE PROJECT IN RELATION TO ITS OBJECTIVES

Part A. With regards the economic perspective the main risks are (delays in) data availability and the validity of the quasi-experimental evaluation methods. These risks are, however, minor. In section 2.2.II.A. we describe a number of alternative identification strategies that we can implement as fall-back scenario's if our benchmark scenario does not work. As we make use of administrative data, issues regarding data availability are minor. Delays can be accommodated for by frontloading some of the work that does not require data (literature review, acquiring methodology, theoretical model).

Part B. A psychological perspective on STW is relatively new and, as with any innovation, it carries a number of risks.

With respect to **RQ4,** a strong feature of the proposed study is that we consider both the bright (through perceived support from the organisation) and the dark (through job insecurity and dehumanization) side of STW: this provides broad coverage of psychological mechanisms. However, it is very likely that these mechanisms do not capture the entire psychological reality of workers experiencing STW. Other variables than those at the core of RQ4 may be at stake. To illustrate, a plausible assumption is that workers differ in how they cope with STW. Some workers may use the time off work to recover, for example by engaging in hobbies or community work, while others may ruminate and feel tense. This difference between problem-focused versus emotion-focused coping has different effects on well-being (e.g., Waters, 2000). As another illustration, some workers may naturally feel more optimistic and others more pessimistic, coined positive versus negative affectivity, and this too may affect the pattern of results (Kaplan et al., 2009). Our response here is twofold. First, though our focus will be on the variables highlighted earlier (see section I), we will include additional variables into the surveys as long as space permits, in order to test alternative explanations: this selection will be inspired on the literature on precarious employment. Second, in the run-up to the project, we will interview workers who were impacted during the COVID-19 crisis with the explicit aim to probe additional underlying dynamics that we are unaware off. Those interviews are part of

an ongoing project on labour market attachment and the potential additional labour market, co-supervised by Nele De Cuyper.

With respect to **RQ5**, perhaps the main challenge is to account for the different career trajectories: STW is intended to provide workers with a stable career and thus many of them will return to their job. Yet, a significant minority may make one or multiple labour market transitions and those can be diverse: from STW to unemployment, sequences of temporary employment, to another job or to another employer. Similarly, transitions are even more likely among groups of unemployed and temporary workers. This could blur comparisons related to outcomes on the longer term. We will account for those transitions in two ways. First, we will follow-up all groups (STW, unemployed, temporary workers) over time and use this information to interpret and enrich findings on comparisons (**RQ5a**). Second, we will account for different trajectories of STW when describing the development of employability over time: depending on the share and complexity of trajectories, we will adapt our analytical strategy accordingly.

2.2. Translation of the research objectives into appropriate and well-described methodology (max. 10 pages)

I. METHODOLOGICAL APPROACH (check ▤ Gender checklist, fill out ▤ Ethics form)

We focus here mainly on the two main parts of our research proposal (**Part A** and **Part B**) which require sophisticated methodological tools (references quoted in in this section are listed at the end of section 2.2.II).

Part A. Micro-econometric evaluations of STW on various firm and employee outcomes

To estimate the impact of STW on firm outcomes (employment and firm survival) in **RQ1**, we need to account for the fact that the use of STW and its intensity are possibly selective and its impact heterogenous. STW usage depends on a number of company features, such the resilience to economic shocks, which is notably a function of the firm's ability in flexibly diversifying activity and of its production storage and labour hoarding capacity. If this selectivity is not controlled for and is related to the outcomes of interest in the absence of STW, then this biases the estimates of the STW effects on these outcomes. For instance, STW is used more intensively by firms that are less resilient against economic shocks and, hence, more at risk of employment loss and bankruptcy during downturns. This means that simple identification strategies that use prior STW take up as instrumental variable (IV) or propensity score matching methods that do not capture these endogenous firm features tend to underestimate the effects of STW (Cahuc et al., 2018; Cahuc, 2019). More sophisticated identification strategies are therefore required, in particular when the treatment effects display *essential* heterogeneity, i.e. effects vary with unobservable firm features (see e.g. Imbens and Angrist, 1994; Heckman and Vytlacil, 2007).

Recently, a couple of researchers have aimed at addressing this selectivity issue with more sophisticated methods. Tracey and Pollacheck (2018) implement a non-parametrically weighting method to control for aforementioned workforce dynamics at the firm level in the absence of STW. Kopp and Siegenthaler (2019) use an Event Study Difference-in-Differences (DiD) approach combined with propensity score matching, contrasting the outcomes of firms that have applied successfully to STW allowances to those that were denied these allowances. They essentially exploit idiosyncrasies in cantonal approval decisions in Switzerland after controlling for firm characteristics. Kato and Kodama (2019) use a similar method on

Japanese data. Finally, Cahuc et al. (2018) as well as Giupponi and Landais (2020) both use Instrumental Variables (IV) methods. The former authors exploit proximity to another firm using STW before the recession and regional responses in the administrative assignment to STW in France, while the latter authors use as IV the interaction between sector codes and firm size which are eligibility criteria for STW in Italy. Essential is that these IVs introduce variation in the use of STW that is exogenous to the outcomes of interest. As explained in more detail below, we propose to use a variant of the last mentioned IV method as identification strategy with regards to RQ1. We will innovate by complementing this analysis by a Regression Discontinuity Design (RDD) to assess the impact of extending the length of the scheme beyond 5 months. The approach of Tracey and Pollacheck (2018) will be considered as a robustness analysis or fall-back solution if the IV strategy does not work.

In **RQ2** we aim at identifying how the take-up of STW affects individual labour market outcomes. This requires controlling for individual selectivity in addition to firm selectivity. To this purpose we will follow a similar approach as Giupponi and Landais (2020) who are the first in this literature to compare the labour market histories between STW recipients and various non-eligible groups based on a worker-level Event Study DiD with individual fixed effects combined with propensity score matching on not only individuals, but also job characteristics at the event time, i.e. the (counterfactual) assignment to STW.

Finally, in **RQ3** we will study the response of experience rating on both the intensity that STW is used by firms and on the consequences it has for individual labour market outcomes. In order to identify these responses, we will rely on the recently *bunching* approach originally developed to evaluate the effectiveness of various tax policies (Kleven, 2016; Saez, 2010). To the best of our knowledge, it has never been applied to evaluate the response to experience rating. As we will see, this approach naturally combines with a theoretical model that we aim at developing to evaluate the optimal form of experience rating in the STW scheme.

The **gender perspective** will receive a particular attention in this research. For women, the current crisis, by its nature, differs from other economic crises experienced in the past. On the one hand, there are sectors in which women are more represented and which have been severely affected by the COVID-19 crisis (e.g., hotels and restaurants, services). Conversely, employment of women is prevalent in the vital sectors, such as the health care and the distribution of food products. Despite this, the rise in regular unemployment is much more marked for women during the Coronavirus crisis than during the 2008 financial crisis (CSE, 2020). Finally, the closing of nurseries and schools also played a role in the effect of the current crisis on women's employment. Some studies mention, for example, the possible link between being temporarily unemployed or laid off, and having young children (CSE, 2020). As the economic crisis continues, it is likely reinforcing the disadvantage faced by women with regard to professional careers and having lasting effects on their incomes. We will therefore pay a particular attention on studying the role of gender as a moderating factor of the estimated effect of STW on the individual level. At the firm level a particular attention is paid to the moderating effect in typically female oriented sectors.

Part B. Impact of STW on worker attitudes, well-being and careers: A psychological perspective

Data collection

We will collect two longitudinal datasets using worker surveys to address **RQ4** and **RQ5** concerning the psychological perspective on STW.

- Regarding **datasets**: Dataset 1 will be collected from specific organisations: this is needed in view of **RQ4** in which the focus is upon differences in attitudes and well-being between workers in STW in comparison to non-impacted workers. Such comparisons are only reliable when contextualized, i.e., when workers share the same environment. Dataset 2 will be collected from the general population: this is needed in

view of **RQ5** concerning career prospects of workers in STW compared to those in regular unemployment and temporary employment.

- Regarding **design**: we aim at a panel cross-lagged design in both datasets. This means that we will follow-up workers over time, using repeated measures. For Dataset 1, we plan to collect three waves, separated six months apart: three waves are needed to probe mediation, for example when STW at Time 1 affects worker attitudes and well-being at Time 3 through organisational support, job insecurity or dehumanization at Time 2. A six-month time lag allows to study outcomes that are more distal, such as well-being. For Dataset 2, we plan to collect five waves, separated three months apart: more waves with shorter time lags match the idea to study the development of employability.

Regarding **samples:** we will aim at a sample in which impacted and non-impacted workers are matched in terms of gender, age and occupational position (i.e., blue- vs white-collar jobs) in Dataset 1, and a sample that is balanced in terms of gender and age in Dataset 2. We discuss samples and sample size in more detail in section 2.2.II.

- Regarding **surveys**: we will use validated scales that have been used successfully internationally, and both across organisations (e.g., in terms of size and sector) and worker types and profiles (e.g., in terms of age and gender). We refer to section 2.2.II for more information. To facilitate response over time, we will keep the surveys as short as possible (i.e., max. 10-15 minutes per survey). This seems particularly important for individuals in more precarious labour market positions for whom the survey is not embedded in a larger initiative supported by the organisation (as will be the case for **RQ5** for example). In addition, we will interview Human Resource managers from each of the participating organisations to provide the contextualization that is needed to interpret results related to **RQ4**.

Data analysis

We will use advanced methods to analyse the data, both variable-centered and person-centered approaches. This combination is relatively uncommon in the field and could provide particularly rich information from different angles. In addition, we will pay particular attention to the role of age and gender.

- **A variable-centered approach** is common in studies in the broad area of work and organisational psychology: the focus is upon how variable X affects variable Y in the total group of respondents or in predefined subgroups. This approach is used to assess interindividual differences and to study causality. A cross-lagged panel design is considered most advanced for this purpose (Finkel, 1995) and it has become best practice in the field of work and organisational psychology. This approach is used to address **RQ4** and **RQ5a** using Structural Equation Modelling.

- **A person-centered approach** has attracted much attention recently (e.g., Mäkikangas et al., 2012) and allows to test entirely different questions, namely questions related to intraindividual differences. This is particularly well-suited to study **RQ5b** on development of employability over time. Specifically, we will test RQ5b using growth mixture modelling or related techniques.

- **Gender and age** have particular resonance in both **RQ4** and **RQ5**. As highlighted under Part A above, women and men are differently affected and hence they may appraise the situation differently. In addition, the labour market is clearly gendered, implying that career prospects naturally differ between men and women. Similarly, the COVID-19 pandemic has hit youngsters particularly hard and this may affect their attitudes, well-being and career prospects. We will account for gender and age in our analyses, for example by using multiple group structural equation modelling in the variable-centered approach (i.e., separate models for men and women and for different age groups) and by linking gender and age to

development in the person-centered approach (i.e., gender and age are used to predict development of employability over time).

Part C. Lessons for the design of STW schemes in Belgium

The aim in this part will be to bring together the findings from Part A and Part B, and to organise discussions between economists and psychologists as to obtain a coherent interpretable story for the findings that emerge from different perspectives and methodological approaches. These discussions will be organised not only at the end of the project, but also each time the main results of each research question are revealed. In this way the findings in one discipline may cross-fertilize by improving the interpretation in the other discipline or it may possibly suggest innovative hypotheses or methods to explore. Based on the coherent story that will emerge from these discussions and from the relevant international literature, we will propose orientations of reforms, if these turn out necessary. Also here a particular attention will be paid to how policies can strengthen the position of women in the labour market.

II. METHODOLOGY (check ▤ Gender checklist, fill out ▤ Ethics form)

Part A. Micro-econometric evaluations of STW on various firm and employee outcomes

Part A: RQ1. The Effect of STW on employment and firm survival

As mentioned above, we identify various sources of exogenous variation in the use of STW that can be used in an IV approach. We first list these potential sources and then explain how we can use them in an estimation strategy. In Belgium one of the first measures to cope with the forced lockdown of economic activity mid-March 2020 induced by the spread of COVID-19 was to simplify the application procedure for firms with regards to the entitlement to STW compensation of their employees. As a consequence, STW was quasi-automatically awarded, so that it is impossible to exploit exogenous idiosyncrasies in assignment decisions by administrators to take into account the selectivity of STW use on the estimation of its impact (Kopp and Siegenthaler, 2019). However, while the eligibility criteria for STW prior to the Coronavirus crisis no longer apply, we argue that they nevertheless induce some exogenous variation in the take-up rate of STW, because past users face less hurdles in using the scheme. In particular, since the eligibility conditions for STW prior to COVID-19 are different and much simpler for blue-collar than for white-collar workers, the presence of blue-collar workers in a company prior to the economic shock must partly exogenously increase the take-up rate of STW. Second, if the use of STW post-lockdown is affected by its prior use, then also idiosyncrasies in the assignment procedure in the past may have a persistent influence the take-up of STW. Prior to the lockdown compliance to the eligibility rules was verified by the 16 regional unemployment agencies. Similar as exploited in the study of Cahuc et al. (2018) in France, this could induce regional heterogeneity in the (speed of) take-up of STW. Furthermore, take-up is expected to be enhanced by coincidental information transmission between firms. Cahuc et al. therefore use the (physical) distance to the closest multi-establishment firm which used STW in the recent past as IV. The aforementioned sources of exogenous variation can also be used to evaluate the use of pre-COVID-19 STW. Such an analysis will permit the identification of longer term effects and the evaluation of the effectiveness of the scheme according to the intensity of the economic shock.

There are also a few potential sources of exogenous variation that are only relevant for the post Corona period and that induces some exogenous temporal variation in the use of STW which can be exploited to obtain some

evidence on the optimal duration of STW compensation and how the effectiveness of the scheme changes with the intensity of the epidemic:

(1) some *non-vital* sectors were forced in lock-down in the early stages of the crisis, while others were either forced to remain operational or could choose to lock down;

(2) some places were most affected by COVID-19 infections (Verwimp, 2020), others (such as Antwerp and Brussels) were quicker and more heavily affected by the arrival of the second wave of infections between the end of July and the beginning of August;

(3) from September 2020, the simplified procedure for the STW application is only available to companies demonstrating that they used STW for more than 20% of their working hours in the second quarter of 2020, or that they belong to a sector that still suffers from the restrictive measures taken by the government to contain the spread of the infection. The aforementioned threshold of 20% suggests that the effect of the extension of STW beyond September 2020 can be identified locally by a RDD.

The aforementioned factors induce some variation in the outcomes that are unrelated to the outcomes of interest. Nevertheless, part of the variation is arguably still endogenous, so that the aforementioned IVs cannot be used as such. We must disentangle the exogenous from the endogenous components in their variation. In a benchmark analysis, we aim at following the approach that is similar to that of Giupponi and Landais (2020). In Italy the eligibility for STW depends on sector and firm size. The researchers allow for endogeneity of these eligibility criteria by controlling for fully flexible interactions of both the sector codes and the firm size threshold (15 employees) with time effects since the onset of the recession. The identifying assumption is that the triple interaction of these eligibility conditions and the time after the onset of the recession is unrelated to the counterfactual outcomes in the absence of STW use. In our context, this would translate to assuming that the triple interaction of two of the IVs in the aforementioned list with the indicator of time after the onset of the recession is unrelated to these counterfactual outcomes. A notable difference in the approach is that the IVs that we consider do not determine eligibility for STW, but rather a higher propensity of using STW. It therefore identifies rather a local average treatment effect (LATE) of complying firms than an average treatment effect on the treated. The two coincide only in the absence of essential heterogeneity.

To check whether such a triple interaction can yield a sufficiently strong instrument in our context, we conducted a pre-analysis on directly available aggregate data on STW use by sector and province for the first 3 months since the onset of the COVID-19 recession. We found that after controlling for interactions of time effects with, respectively, sector and province dummies, an indicator selecting sector-province combinations with more than 10% blue-collar workers in the 2019 workforce is highly significantly and positively correlated with the use of STW after the onset of the Corona crisis in Belgium, which suggests that this triple interaction is a sufficiently strong IV to result in reliable inference in a standard IV approach without *essential* heterogeneity. This evidence is obviously only suggestive and requires modification when the analysis is performed on disaggregated firm level data.

As in Giupponi and Landais (2020), the validity of this triple interaction IV must be checked by placebo tests on the period before the onset of the recession and a number of robustness analysis. If these tests would reveal that the identifying assumption is rejected, we can still choose an alternative pair of IVs among the aforementioned list, or follow the IV approach suggested by Cahuc et al. (2018). Even if none of these approaches would work, the non-parametric weighting method that uses firm information to proxy workforce dynamics prior to the onset of the recession to control for endogenous selection in STW remains a fall-back scenario (Tracey and Pollacheck, 2018).

Part A: RQ2. *The dynamic impact of STW on individual labour market outcomes*

Few studies on STW efficiency has focused on individual worker outcomes. There are studies that analyse employment trajectories and later employment outcomes of workers on STW (or other forms of temporary

layoffs) as well as the factors that determine these outcomes (e.g., Nekoei and Weber, 2020; Struyven et al., 2016), but few attempts to compare the relative effectiveness of STW to being employed in or laid off from a firm that does not make use of STW. With this second research question we aim at getting more insight into the consequences of STW for the individual worker's labour market trajectory, such as employment, working hours, earning and income (including transfer income). By focusing at the individual level and at heterogeneous effects along various dimensions (such as gender, age, schooling level, etc.), this analysis forms a natural point of comparison and input for a dialogue with the psychologists in this research team.

The analysis will be based on an event study DiD analysis at the worker level in the same vein as the one presented by Giupponi and Landais (2020), i.e. combined with propensity score matching (or weighting) to make workers in two comparison groups as similar as possible based on individual and job characteristics as measured prior to the onset of the recession. An important distinction is, however, that aforementioned researchers can contrast workers eligible for STW to workers who are not eligible. We cannot do this, because the aforementioned IVs generate rather exogenous variation in the take-up *rate*. This means that we may have untreated individuals in the treatment group and treated individuals in the control group. In such a setting the event study DiD will rather identify an intention-to-treat effect of STW. We will investigate whether we can then apply the Fuzzy DiD methodology of De Chaisemartin and d'Haultfoeuille (2018, 2020) to identify the LATE, which to the best of our knowledge has not yet been applied in an event study DiD. We will also study the moderating impact of gender, age, employment status, job and firm characteristics and labour market history.

Part A: RQ3. *The effectiveness of experience rating in STW*

In 2012, the blue-collar regime of STW for economic reasons was reformed in Belgium. In order to limit the excessive reliance on this system in a number of firms, the federal government introduced an employer's experience-rated contribution rate, similar to the one that had been in place in the building industry since 2005. The basic principle is as follows: when the number of days in STW surpasses 110 for a worker during the previous calendar year, the employer must pay a special social security contribution, which is proportional to the number of days beyond this threshold; the contribution increases in stages according to the number of excess days. In 2017, the contribution system changed deeply. If the limit of 110 days is crossed, the contribution is no longer due only for the number of excess days, but for the *total* number of days of STW during the quarter in which the limit is surpassed. In addition, the reform imposed a quarterly contribution and a reference period that starts running from the current quarter and includes the three preceding quarters.

The experience rating system in the Belgian STW scheme is different than the one that we observe in other countries, such as in Italy and the United-States, that implement some form of experience rating (Cahuc and Nevoux, 2019). In Belgium the experience rating occurs at the *intensive* margin (the number of days), while in other countries it rather applies to decisions at the *extensive* margin (the decision to use STW or not). Moreover, in Belgian the experience rate is calculated at the individual worker's level, while elsewhere it is usually only determined on aggregate at the firm level. This means that we will focus on other features than in the existing literature. In particular, by imposing the contribution at the worker level, the experience rating in the Belgian system may also have an impact on the distribution of STW over the firm's workforce, as it becomes costly for the firm to concentrate STW on a few workers. We therefore aim at not only studying the implications of experience rating on firms' behaviour, but also on workers' labour market outcomes and the distribution of the burden of the economic shock across the workforce. In this analysis, the input of the psychological perspective will be particularly relevant.

Empirical evaluation (RQ3)

The form of experience rating in the Belgian STW scheme makes it natural to analyse the behavioural reactions of firms and workers to it by the bunching approach (Saez, 2010; Kleven, 2016). The idea of "bunching" is linked to that of RDD and RKD (regression kink design), but the difference is that the assignment variable (running variable)

can be directly manipulated while the validity of RDD and RKD depends on the condition that the assignment variable cannot be manipulated. In our case, the introduction of an experience-rated contribution tax introduced a discontinuity, at 110 days in the *marginal* employer's contribution rate, i.e. a "kink", for using STW for a particular employee. Its reinforcement in 2017 introduced a discontinuity in the *average* contribution rate at the same point, i.e. a "notch". As the assignment variable, i.e. the number of days in STW, can be manipulated by the company, it can be expected that there will occur a "bunching" of STW use at 110 days. The method exploits the importance of "bunching" to estimate the elasticity of STW use to the contribution rate. The advantage of this method is that it allows to identify effects (although only locally) without requiring control groups. In the presence of optimization frictions or reference dependence, non-parametric identification of these effects becomes difficult (Kleven, 2016), but this limitation is less relevant here as firms are expected to behave more rationally than individuals.

The bunching method can be directly applied to identify the impact of the experience rating on the demand for STW at the individual level and, after aggregation at the firm level. However, we also aim at estimating its impact on other outcomes measured at the firm or worker level. We will therefore need to follow a two-stages estimation procedure as in an IV approach, but where the first stage is estimated by bunching. We are not aware any other study that follows such a two-stage approach.

Theoretical model (RQ3)

In order to make policy recommendations with respect to the design of the STW scheme, we have to go beyond the reduced form analysis of treatment effects. We therefore aim at building a theoretical model that can capture the essential efficiency trade-offs of a STW scheme and in which experience rating is modelled as the main policy instrument. This model will then be calibrated using in part the estimations of the empirical analysis as to obtain insights in the efficiency of the current experience rating scheme and directions of improvement.

The efficiency of the STW essentially depends how the cost induced by the slowing down of the relocation process of labour trades off against the benefit of preventing inefficient lay-offs by credit-constrained firms. It is therefore essential that the theoretical model captures these main ingredients. A potential model that shares these features is the one that has been developed by Cahuc et al. (2018). It is a directed search and matching model with multi-worker firms that generalizes the model of Cooper et al. (2017). But alternatives exist, such as the implicit contract model of Braun and Brügemann (2017). One of the tasks in this research is to further explore this literature and to determine which model is best suited for our purposes.

Cahuc and Nevoux (2019) argue that experience rating in STW is counterproductive, because it reduces the attractiveness of firms to prevent inefficient lay-offs, which is precisely the main aim of the scheme. They show that it is therefore better to combine a STW scheme that is not experience rated with a regular unemployment insurance scheme that *is* experience rated. However, this conclusion is based on experience rating that sanctions the use of STW at the *extensive* margin. Intuitively, there may still remain an issue that employers may *over*use STW at the *intensive* margin. The Belgian experience rating scheme in STW precisely addresses this issue. One of our objectives is therefore to verify whether or not the intuition that sanctioning overuse at the intensive margin is useful can be confirmed in a theoretical model and, if so, how the sanction should be designed.

Part A*: The data*

The micro-econometric evaluations of STW schemes will be based on administrative records. A major source for research is the Crossroads Bank for Social Security (CBSS)(*). The CBSS links data from the different Belgian Social Insurance institutions and selects linked data available for the researchers. These data are gathered in the so-called "Data Warehouse Labour Market and Social Protection".

The main advantage of the Data Warehouse is that researchers have direct access to the linked data without needing to get approval of each institution separately. The research team introduces one single request to the

relevant committee of the CBSS. This procedure also guarantees that the privacy of citizens is preserved: only pseudonymous individual data are delivered and it is ensured that the identity of individuals and firms cannot be recovered on the basis of the personal information contained in the variables transferred to researchers. The procedure nevertheless takes time. This is a major reason why we don't plan to start the first econometric estimations of the project within the first 9/12 months after the start of the project. There are also serious delays in data becoming available (at least two years). This is not an issue for RQ3 since the most interesting policy reform of the Responsibility Contribution took place in early 2017. In order to evaluate the Corona version of the STW scheme (RQ1 and RQ2), we can fortunately rely on the very recent data (year 2020) that the BCSS has made available for policy support and scientific research purposes in the context of the COVID-19 crisis.

CBSS' administrative data cover the entire Belgium population and contain, among others, information on workers' characteristics (gender, age, wages, hours worked, number of days of STW, place of residence, time spent in sickness and disability insurance) and their employers (sector, company's size and location) as well as on receipt of Social Security allowances, among which the STW compensation. The main interest variable of the analysis, i.e. STW usage at the firm and worker level, is therefore available from this source. It is a panel dataset with unique identifiers for workers and firms. This panel dimension will be exploited in the econometric estimations.

For RQ1 and RQ3, the Data Warehouse does not contain all required information. In particular, the CBSS dataset contains limited information on firms. Using the unique firm identifier, CBSS data will be linked to Bel-first (**), a panel dataset on firm performance (value-added, labour cost, profit). Linkages between these two data sources have already been realized successfully in other research in Belgium (e.g., Vandenberghe, 2016). The matched data will provide us with a rich firm level dataset in which information about the level and the structure of the workforce coexists with more traditional firm outcomes. We must however consider the fact that coupling these two sources of data will lengthen the time to obtain the complete dataset. Moreover, for multi-establishment firms, Bel-first contains only information at the level of the parent company. This can be an advantage though if we want to use the (physical) distance to the closest multi-establishment firm as IV (see discussion in RQ1 above).

The Data Warehouse contains only partial information on the income received by employees on STW. Supplements paid by the employer or the sectoral committee -which might be important- are not complete in the Social Security records. For RQ2, we plan to request complementary information from the fiscal data using the unique worker identifier of the BCSS dataset. We identify two constraints that may hinder this data matching process. First, there is at least two years delay in the fiscal data, which makes it difficult to use them to evaluate the Corona version of the STW scheme. Second, there also seems to be longer delays in the data request procedure to CSBB when fiscal data are required. The analysis on this information will therefore planned during the end phase of this research.

(*) See https://ksz-bcss.fgov.be/fr

(**) See https://belfirst.bvdinfo.com/version-2020714/Login.serv?product=belfirstneo&SetLanguage=fr

Part B. Impact of STW on worker attitudes, well-being and careers: A psychological perspective

Part B: General

In order to achieve the objectives related to RQ4 and RQ5, two longitudinal datasets will be collected using worker surveys. This investment is needed given the overall shortage of psychological research and hence datasets on STW in Belgium and elsewhere. When datasets do exist (e.g., Data Warehouse, EAK, LFS), few psychological variables are included and if so, only proxies for workers' appraisals are used. In addition, those datasets do not provide the contextualization that is needed for interpretation of psychological processes. To increase transparency and to maximize impact of the project, the datasets generated during the project will be made

available through the universities' repository after an embargo period. Such embargo allows the researchers to achieve the aims and objectives of this research project and to generate publications associated with the project.

Sample size for both datasets will be a function statistical considerations and anticipated response rate (see RQ4 and RQ5 below for details). Under First, we comply with the recommendation by Hair et al. (2014): sample size will be based on the complexity of the model tested and the characteristics of the basic measurement model. In particular, we will account for (a) the number of latent factors included in the model, (b) the number of items (observed variable) per latent factor and (c) the size of the communalities. In addition, Hair et al. (2014) suggest increasing sample size in the case of multivariate non-normality, too many missing values (>10%) or particular estimation methods. Under Second, Anseel et al. (2010) have convincingly demonstrated that a response rate of about 60% can be expected when surveying the type of respondents (e.g., non-working respondents or non-managerial respondents) we will target in the present research project. This information will serve to determine the initial versus actual sample size needed at Time 1 to run our statistical analyses. Note that we will use a method for estimating missing values (Hair et al., 2014) so that sample attrition between measurement times does not reduce the size of the final sample on which the analyses will be performed.

Part B: RQ4. *The impact of STW on worker attitudes and well-being*

In RQ4, we probe the potential bright and dark side of STW by comparing impacted and non-impacted workers from within the same organisations on attitudinal and well-being indicators along with underlying dynamics(***).

We will recruit organisations that differ in size and come from different sectors, and with specific attention to gender and age distribution in those sectors. Sample composition will be defined in consultation with the Centre of Expertise for Labor Market Monitoring (CELM; https://www.steunpuntwerk.be/) based on recent figures on characteristics of the group of workers in STW. We have good contacts with the coordinator of CELM based on earlier and ongoing collaborations. We do not anticipate problems in securing access to organisations: we have a large and complementary network, with easy outreach to organisations in different sectors and with additional excellent contacts with other labour market actors (e.g., trade unions, policy-makers). To illustrate, we successfully collected data on related and sensitive topics, for example temporary employment across organisations in the context of the European Project Psycones (Guest, Isaksson and De Witte, 2010) and diverse samples on worker employability (project G.0987 funded by FWO, project OT/11/010 funded by KULeuven). To make a strong appeal on organisations, we will reward participation by a feedback report at the level of the organisation.

Given that (a) we have at least 7 latent factors with (b) minimum three items per latent factor (see below) and (c) that we anticipate good "communalities" (based on prior studies using the same scales), actual sample size at Time 1 should be at least 500 people following Hair et al.'s (2014) recommendations. To be on the safe side and to allow for subgroup analyses (e.g., on the basis of gender), we will aim at a sample size of N = 600 at Time 1: indeed, multi-group analyses require a minimum of 300 people per group (Hair et al., 2014). Anticipating a response rate of approximately 60% (see above; Anseel et al., 2010), this means we will reach out to 1000 workers at the start (see Table 1 below for details). We anticipate a response rate of 70% in later waves: this is slightly higher than initial response rate because of the foot in the door effect and in line with earlier studies in similar contexts. To increase initial and repeated participation, we provide incentives for participation: 5 euro per worker per wave, totalling 6600 euro for Dataset 1. Workers will be contacted via their work mail address or via regular mail in the organisation if they do not have or do not currently have access to work mail. Waves will be linked on the basis of those mail addresses or based on an individual code created by the respondent him/herself.

Table 1. Dataset 1: Sample size and costs (in Euro) per wave

	Recruit	T1	T2 T1+6m	T3 T1+12m
Impacted worker	500	300	210	150
Non-impacted worker, impacted organisation	500	300	210	150

Total sample size	1000	600	420	300
Costs per wave, in Euro		3000	2100	1500

The survey that will be distributed at each measurement time will be made up of validated and frequently used scales, most of which are available in both Dutch and French. In the following, we will pay specific attention to the variables that are at the core of our research model. Perceived organisational support will be measured with the short 8-item scale for perceived organisational support developed by Eisenberger et al. (1986) and used still today (see e.g., Eisenberger & Stinglhamber, 2011; sample item: "the organisation really cares about my well-being"). Job insecurity will be measured with the 4-item scale developed by De Witte (2000) and validated by Vander Elst, De Witte and De Cuyper (2014; sample item: "I feel insecure about the future of my job"). Organisational dehumanization will be assessed through the 11-item scale developed by Caesens et al. (2017; sample item: "My organisation considers me as a tool to use for its own ends". Employee attitudes refer to affective (sample item: "I really feel that I belong to this organisation"), continuance (sample item: "I have no choice but to stay with this organisation") and normative commitment (sample item: "It would not be morally right for me to leave this organisation now"). We will use scales used by Stinglhamber et al. (2002), based on the work by Meyer et al. (1993). Finally, worker well-being concern both motivation and strain, in the form of work engagement and burnout, respectively. Work engagement will be measured with the short 3 item version of the UWES (Schaufeli et al., 2019; sample item: "At my work, I feel bursting with energy"). Burnout will be assessed with the newly developed and internationally validated Burnout Assessment Tool (BAT; De Beer et al., 2020; Schaufeli et al., 2020; sample item: "At work, I feel mentally exhausted").

In addition to the survey, we will interview the HR managers of our recruited organisations to probe their views on STW: the focus will be on motives for using STW, how STW is implemented in the organisation and the potential consequences for both organisations and workers. This information will be used to provide contextualization.

(***) Although some studies have questioned its actual existence (Baruch and Hind, 2000), particular attention will be paid to the possibility that the "survivor syndrome" (highlighted in the literature on organisational changes and restructurings, and showing that workers who remain in an organisation after an organisational change experience the adverse impact of this change as profoundly as those who have left) may arise in the examination of the effects of STW in terms of workers' attitudes and well-being. If such an effect were to occur, adjustments in the methodology for RQ4 could be introduced using non-STW impacted organisations as benchmarks.

Part B: RQ5. *The impact of STW on individual careers*

In RQ5, we probe the impact of STW on individual careers, relative to those in regular unemployment schemes and temporary employment (RQ5a) and over time (RQ5b). Data will be collected from the general population, balanced for gender and age.

We will collect data using panel providers. We are well aware that this particular sample of workers affected by STW, those in unemployment and temporary workers is difficult to reach. We decided to work through panel providers to secure a guaranteed response and a buy-in of expertise on how to recruit respondents from those particular groups. Panel providers are successful in recruiting individuals currently without work or on more precarious forms of employment, as those individuals are both available for surveys and willing to participate in view of a financial return (Anseel et al., 2010). We are confident about the feasibility given our earlier and successful experiences with various panel providers. Panel providers will be hired by an output-commitment based on sample size. Expected cost varies between 15.000 and 20.000 euro.

We aim at an actual sample size of 400 workers affected by STW at Time 1: given a response rate of approximately 70% for each measurement time, this will lead to a sample size of 100 workers at T5 (see Table 2). We will sample 200 individuals in regular unemployment schemes and 200 temporary workers at Time 1: this will allow comparisons between groups (RQ5a). We will follow-up those group at T3 (T1 + 6 months) and T5 (T2 + 12 months)

to study longer term impact. Note that we oversample workers affected by STW at Time 1 in view of RQ5b which ideally requires more waves, hence with the risk of larger dropout. The specific means (electronic survey, interviews, paper and pencil) are still undecided but will be an important point for discussion with panel providers.

Table 2. Dataset 2: Sample size per wave

	T1	T2 T1+3m	T3 T1+6m	T4 T1+9m	T5 T1+12m
Workers in STW	400	280	200	140	100
Regular unemployment scheme	200		140		100
Temporary worker	200		140		100
Total sample size	800		480		300

The survey that will be distributed at each measurement time will be made up of scales measuring perceived employability and career success and insecurity as a core outcome. Specifically, perceived employability will be measured with the four-item scale by De Cuyper and De Witte (2010) and used successfully across employee profiles (Forrier et al., 2015; A sample item: "I am optimistic that I could find a/another job if I looked for one"). Career success will be measured with four subdimensions from the scale developed by Shockley et al. (2016), namely authenticity (3 items; sample item: "Considering my career as a whole, I have chosen my own career path"), personal life (3 items; sample item: "Considering my career as a whole, I have been able to have a satisfying life outside work"), growth and development (3 items; sample item: "I have stayed current with changes in my field") and satisfaction (3 items; sample item: "my career is personally satisfying"). The other subdimensions (recognition, quality of work, meaningful work and influence) are conditional upon having a job and therefore not included. Finally, career insecurity will be measured with the scale currently being developed by Spurk, Hofer, De Cuyper and De Witte: career insecurity relates to individual's concerns and worries that central content aspects of the future career may develop in an undesired manner. The measure has eight subdimensions all with particular resonance for this project: (1) career opportunities, (2) prestige and qualifications requirements, (3) contractual employment conditions, (4) unemployment prospects, (5) change of workplace, (6) retirement, (7) work-non work interactions and (8) mismatch between personal resources and work demands.

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