Université de Strasbourg

BETA Bureau d'économie théorique et appliquée UMR 7522

Augustin Cournot Doctoral School

UNIVERSITÉ DE STRASBOURG

ÉCOLE DOCTORALE AUGUSTIN COURNOT ED 221

BUREAU D'ÉCONOMIE THÉORIQUE ET APPLIQUÉE UMR 7522

THÈSE

pour l'obtention du titre de Docteure en Sciences Économiques

Présentée et soutenue le 12 Décembre 2022 par

Agathe SIMON

Essays on unemployment benefits systems and poverty in Europe

---

Préparée sous la direction de Amélie BARBIER-GAUCHARD et Mathieu LEFÈBVRE

Membres du jury :

Bertrand KOEBEL	Professeur des Universités, Université de Strasbourg	Président du Jury
Alain JOUSTEN	Professeur des Universités, Université de Liège	Rapporteur
Elena STANCANELLI	Professeure des Universités, PSE	Rapporteure
Mathias DOLLS	Senior Economist, ifo Institute, Munich	Examinateur
Amélie BARBIER-GAUCHARD	Maître de conférences HDR, Université de Strasbourg	Directrice de thèse
Mathieu LEFÈBVRE	Professeur des universités, AMSE	Directeur de thèse

Membres invités :

Isabelle TERRAZ	Maîtresse de Conférences, Université de Strasbourg

L'Université de Strasbourg n'entend donner aucune approbation, ni improbation aux opinions émises dans cette thèse ; elles doivent être considérées comme propres à leur auteur.

Direction de la **recherche**
et de la **valorisation**
Collège **doctoral**
Université de Strasbourg

Déclaration sur l'Honneur

Declaration of Honour

J'affirme être informé que le plagiat est une faute grave susceptible de mener à des sanctions administratives et disciplinaires pouvant aller jusqu'au renvoi de l'Université de Strasbourg et passible de poursuites devant les tribunaux de la République Française.

Je suis conscient(e) que l'absence de citation claire et transparente d'une source empruntée à un tiers (texte, idée, raisonnement ou autre création) est constitutive de plagiat.

Au vu de ce qui précède, j'atteste sur l'honneur que le travail décrit dans mon manuscrit de thèse est un travail original et que je n'ai pas eu recours au plagiat ou à toute autre forme de fraude.

I affirm that I am aware that plagiarism is a serious misconduct that may lead to administrative and disciplinary sanctions up to dismissal from the University of Strasbourg and liable to prosecution in the courts of the French Republic.

I am aware that the absence of a clear and transparent citation of a source borrowed from a third party (text, idea, reasoning or other creation) is constitutive of plagiarism.

In view of the foregoing, I hereby certify that the work described in my thesis manuscript is original work and that I have not resorted to plagiarism or any other form of fraud.

Nom Prénom : Agathe Simon
Ecole doctorale : Augustin Cournot ED 221
Laboratoire : Bureau d'Économie Théorique et Appliquée UMR 7522

Remerciements

La réalisation de cette thèse n'aurait pas pu être possible sans le soutien de nombreuses personnes, que je tiens à remercier ici.

Je tiens tout d'abord à remercier chaleureusement ma directrice et mon directeur de thèse, Amélie Barbier-Gauchard et Mathieu Lefèbvre. Merci à Amélie, pour m'avoir donné envie de faire de la recherche et inspirée lorsque j'étais encore étudiante. Je tiens à la remercier de m'avoir accompagnée et suivie depuis maintenant plus de sept ans. C'était avec plaisir que j'ai travaillé avec elle, que ce soit pour les enseignements ou lors de nos co-écritures sur une thématique qui nous rapproche: l'Europe. Merci à Mathieu pour tout son soutien au cours de ces quatres années. Ses conseils toujours pertinents, mais aussi sa bienveillance et son optimisme m'ont grandement aidée dans la réalisation de cette thèse. Je suis très contente d'avoir eu l'occasion d'écrire un chapitre avec lui. J'ai beaucoup de reconnaissance, mais aussi d'admiration à son égard.

I would also like to thank all the members of my jury Alain Jousten and Elena Stancanelli, the two referees, as well as Mathias Dolls and Bertrand Koebel, to have accepted to take part of it. I am grateful to the jury for devoting their time to read my work and honored for their presence at my defense.

I express my gratitude to Mathias Dolls and Isabelle Terraz for giving me a lot of guidance as a member of my Ph.D committee. Merci à Isabelle pour m'avoir initiée à la recherche lors de mon stage de Master sous sa supervision.

Merci également à Bertrand Koebel qui avait discuté mes travaux lors d'un séminaire doctoral, et qui m'a régulièrement apporté des retours très précieux sur mes travaux.

I would also like to thank the co-author of one of my chapters, Xavier Jara Tamayo, for his support. I benefited from his valuable advices, not only for our paper, but during the entire thesis. His commitment went far beyond that of a co-author and I am very grateful to him.

Je remercie le Bureau d'Economie Théorique et Appliquée (BETA) et l'Ecole

doctorale Augustin Cournot pour avoir mis à ma disposition l'ensemble des moyens intellectuels et financiers pour la réalisation de ces travaux. Je tiens particulièrement à remercier Virginie Gothié et Nathalie Hammerschmitt pour leur aide et leur gentillesse.

Je tiens aussi à remercier mes collègues doctorant.e.s et ami.e.s, pour tous les bons moments passés ensemble.

Tout d'abord, merci à celles et ceux qui m'ont si bien acceullie dès les premiers jours de mon doctorat: Benoit, star montante du chant irlandais, Cyrielle, pour tous ces verres au koko et ses précieux conseils, Laetitia, à nos soirées à Kantine et Klimperkasten, Laurène, pour notre passion commune pour SML, Nono, pour nos 'good times' au RU, et Yanto, mon parteneraire CAPSE et ma personne favorite avec qui m'engueuler. Merci pour toutes ces soirées passées ensembles et nos aventures à Konstanz. Une pensée particulière à Benoit, qui a mis mes performances cardiaques à rude épreuve plus d'une fois, mais sur qui je peux toujours compter.

Merci à ma team du bureau 154, Emilieng, référent blagues douteuses et professionel des TD en lendemain de soirée, Guillaume, futur maire du Havre, Mr. Météo et meilleur coach sportif, et Kévin, pour ces fameux week-ends dès le mercredi. Nous nous batterons toujours pour 11h45, la lutte continue. Merci également à Diletta et Shengxi pour nos moments passés ensembles.

J'ai également une pensée pour Anne-Gazelle et ses conseils en optimisation fiscale, Jérôme Frite le king d'Améthis (je t'enverrai un message pour m'excuser tqt), Kenza, mannequin pieds à ses heures perdues, Louis pour ses chorégraphies sur le bar du Korrigan, Romane, la meilleure partenaire de concerts, soirées et de cellule d'enquête interne, Théo pour nos duos sur Womanizer.

Merci à Antoine pour ses précieux retours sur mes travaux en séminaire doctoral. Merci à Samuel d'avoir pris le temps de relire mes travaux ainsi que pour ses conseils.

Je pense également à mes ami.e.s en dehors du domaine universitaire, qui ont toujours été à mes côtés. Alexandra et Charlotte, que j'ai rencontré dans les locaux du PEGE et qui sont devenues de précieuses amies. Merci à Charlotte pour avoir été si présente dans des moments difficiles. On se retrouve bientôt à Marseille. Je pense aussi à Antoine, Ted et Marion (et bien-sûr Neptune).

Merci à mes ami.e.s de toujours, Léo & Valent, Karim, Nils, Valou, Tomy et Yvan, mes frères maudits de Terka. C'est avec beaucoup d'émotion que je pense évidemment à mes meilleures amies, mes soeurs, mes sangs de la veine, les MACF. Inutile de vous expliquer que je n'en serai jamais arrivée là sans vous et votre soutien inconditionnel. Je suis très heureuse de passer cette étape de ma vie, avec une fois de plus, vous à mes côtés.

Mes pensées vont à ma famille, pour tout leur soutien et leur amour. Je suis extrêment reconnaissante envers mes parents, qui m'ont soutenue à chaque étape de mes études, et m'ont toujours valorisée et encouragée dans mes choix. Merci à Marine, ma soeur et à Etienne, mon frère, d'être toujours là pour moi. Je pense aussi

à mon neveu, Arthur, qui m'a apportée beaucoup de bonheur depuis son arrivée dans notre famille. Je remercie aussi ma grand-mère, Suzanne, qui m'a souvent parlé de son rêve de faire des études et me soutenait dans cette direction. Je pense également à ma cousine, Charlotte, qui compte énormément pour moi.

Enfin, je tiens à remercier Pierre, avec qui je me suis toujours sentie comprise. Traverser à ses côtés ces moments de nos vies, si cruciaux et intenses en émotion, m'a énormément aidée. Je ne compte plus le nombre d'heures passées ensemble (avec Marvin mon bébé) à travailler, s'aider et surtout se soutenir. Je repenserai toujours à cette période de nos vies avec beaucoup de tendresse.

Contents

General Introduction

Over the last two decades, European labour markets have shifted from standard full-time and open-ended employment to more flexible forms of employment. This phenomenon is partly a consequence of the recent economic crises and technological and demographic changes, which have led to the development of these new forms of employment.

Atypical or non-standard workers correspond to types of employment deriving from the standard full-time, open-ended contracts. They relate to temporary jobs, part-time work and solo self-employment[1]. These workers, who are more likely to have lower annual hours, also face higher risks of precariousness and poverty. In addition, social protection systems are often designed for full-time standard employment, as they are contribution-based. Consequently, non-standard workers might have lower access or benefits [OCDE, 2018]. Thus, social welfare systems, notably insurance-based benefits, must adapt to flexible employment to be more accessible to these forms of employment.

The recent COVID-19 crisis revealed gaps in access to social protection across workers, and many countries urgently had to extend unemployment benefits entitlement. During the crisis, ten European countries relaxed their eligibility conditions to allow more workers to access unemployment benefits [Denk and Königs, 2022]. In particular, European countries have been encouraged to increase the inclusiveness of their social protection systems as a follow-up to the European Pillar of Social Rights. The recent European Directive (2019/C 387/01)[2] recall that *'regardless of the type and duration of their employment relationship, workers, and, under comparable conditions, the self-employed, have the right to fair and equal treatment regarding*

[1]Both concepts of non-standard or atypical workers are commonly used by ILO, see https://www.ilo.org/global/topics/non-standard-employment/lang–en/index.htm, and the European Commission [2016], and OCDE [2018]

[2]For more details, see https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019H1115(01)

working conditions, access to social protection and training.'.

This dissertation contributes to this discussion. It answers two questions: To what extent do these non-standard forms of employment imply an increased poverty risk for workers? How can unemployment insurance systems perform as a tool to better protect individuals?

Chapter 1 addresses the first question. It studies one type of non-standard workers, temporary contract workers specifically, and assesses how they might face poverty. The following two chapters deal with the second question. Chapter 2 assesses how unemployment benefit systems could be more accessible and protect better non-standard workers. Chapter 3 studies how changes in unemployment benefits affect labour supply decisions and reduce inequalities and poverty for all types of workers.

In the remainder of this introduction, I will first present the development of non-standard forms in Europe and current issues that they may raise in policy and academic debates. I will next present the second object of study of this thesis, the role of unemployment benefit systems and their functioning. Then, I will present the research objectives and methods mobilised in this thesis. The last part will detail the different chapters constituting this dissertation.

New forms of employment in European countries

Part-time work, temporary jobs, and (solo) self-employment have become more prevalent in recent decades. These forms of employment are called non-standard or atypical, in opposition to standard employment, corresponding to full-time, open-ended contracts with a single employer.

Eurostat defines part-time employment as an employment relationship where the usual work hours are less than those of comparable full-time workers [Bollé, 1997]. Other definitions are based on the hours' threshold. Workers are considered part-time by the OECD when they are working less than 30 hours per week in their main job[3]. Temporary employment corresponds to workers who are engaged only for a specific period. Most temporary contracts are fixed-term contracts, but there are other types, such as project or task-based contracts, as well as seasonal or casual work. Temporary employment includes temporary agency employment, where a temporary agency employs workers to perform work at the user company. Tempo-

[3]See https://data.oecd.org/emp/part-time-employment-rate.htm

rary agency work remains relatively marginal (2.1% of employees aged 20-64 years old in the EU in 2019), although this is an increasing type of contract in many countries. Self-employment characterises individuals who are sole or joint owners of an unincorporated company in which they work. In 2021, 13% of employed people aged between 20-64 years in the EU were self-employed. More than two-thirds of self-employed persons (68.2%) in the EU were solo self-employed, while 31.8% were employers.

As noted above, labour markets have been evolving to favour this type of employment. The share of standard workers decreased by four percentage points between 2002 and 2016, amounting to 59% of total employment in 2016 [European Commission, 2018b]. In the EU, part-time jobs represented 17.7% of total employment in 2021. Between 2002 and 2020, the share of part-time workers in the EU increased by four percentage points (Figure 6). Temporary contracts accounted for 12.1% of the total employment in 2021 in the EU. Self-employed amounted to 13% in 2021. Since 2000, temporary employment has represented the majority of job growth in Europe. The share of self-employed people has remained relatively stable in the last decades, while the duration of their contract tends to shorten [Vacas-Soriano et al., 2015]. Solo self-employed have gained a growing share of employment in recent years.

While this type of worker has generally risen in the EU, the prevalence of both types of atypical work remains quite heterogeneous among countries (Figure 7). The share of temporary employment goes up to more than 20% in the Netherlands and Spain, whereas it ranges between 3-15% in other EU countries. Part-time employment is prevalent in the Netherlands, Austria and Germany, where around one-third of the working population is part-time. Part-time workers increased remarkably during the 2000s for these three countries. The share of self-employed over total employment also differs strongly across countries. This type of worker is highly prevalent in Greece, representing almost 28% of employment, but also in Italy or Poland. In contrast, it is still uncommon in Germany, Denmark and Luxembourg.

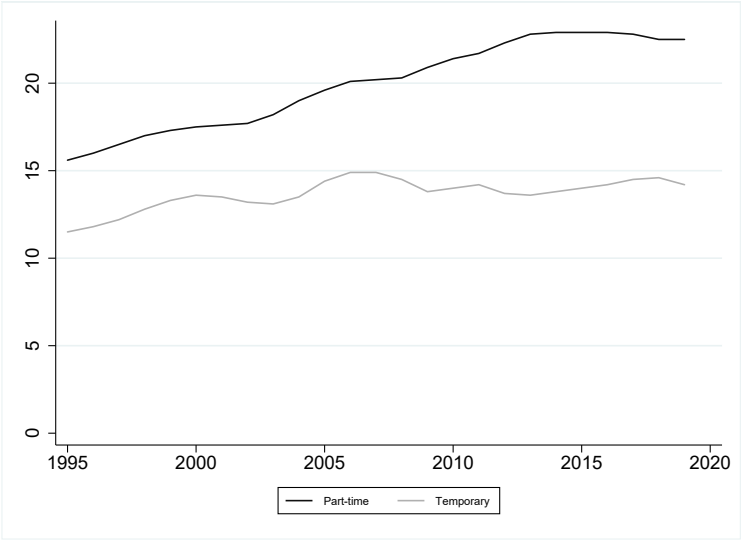


Figure 2: Evolution of temporary and part-time employment (EU-15)

Source: Eurostat

Note: This figure presents the prevalence of temporary and part-time employment between 2002-2019 for EU-15 countries average. Part-time employment is expressed as share of total employment and temporary contract as share of employees.

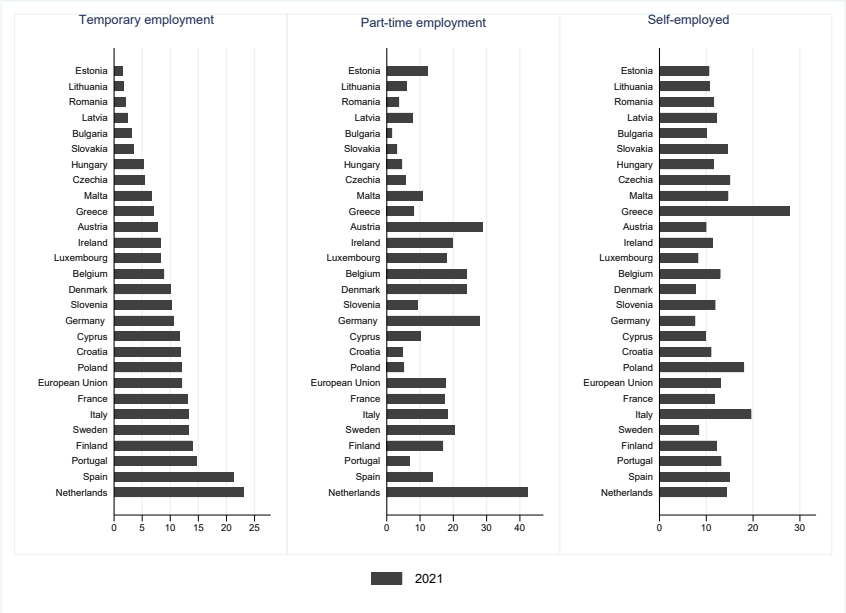


Figure 3: Prevalence atypical workers over total employment by subgroup for 2021

Source: Eurostat

Note: This figure presents the prevalence of both temporary, part-time employment and self-employment over total employment for European countries.

This rising prevalence of non-standard workers is partly the consequence of reforms promoting this type of employment, intending to increase flexibility for firms and reduce unemployment.

At the beginning of the 2000s, countries such as Belgium, Germany, France, Italy, Spain, and Sweden facilitated the use of temporary contracts[4]. A resurgence of these types of reforms happened since the 2010s, especially for countries heavily affected by the crisis such as Greece, Portugal or Spain.

These reforms since the 2000s followed the EU Directive, aiming to promote flexible employment while setting common standards for employment protection of these forms of work. The EU Directive of 1998[5] aimed a promoting part-time, restricting discrimination against these workers, and improving their working conditions. In 1999, the European Commission adopted a Directive on fixed-term work[6] which limited abusive usage of temporary contracts. Following this measure, European countries implemented a maximum duration and a limited number of renewal of temporary contracts, even if this duration differs significantly between countries. For example, in 2003, Germany extended the maximum duration from 2 to 4 years, and Portugal went up to 6 years, while it is around three years in many other countries. A more recent Directive, specifically on temporary agency employment, was adopted in 2008. This Directive aimed more protection for temporary agency workers by ensuring 'equal treatment' (equal condition and pay) as employees for the same work in the same company. However, the protection is minimal compared to the two previous Directives, as no maximum duration or renewals must be imposed. Also, this Directive explicitly allows for derogation of this equal treatment if the social partner agrees on [O'Connor, 2013]. For the self-employed, there are no specific EU Directives and common standards between European countries so far. An agreement on working conditions for solo self-employed is planned[7]. This, as a consequence of the recent developments of solo self-employed, in particular platform work, raising concerns about their working conditions.

As mentioned earlier, the rationale behind the promotion of this type of contract is fighting unemployment and allowing firms to adapt the number of employees to fluctuations in activity. For example, Katz et al. [1999] has shown that the growth of temporary work in the US during the 1990s has accounted for a 0.4 percentage points

[4]See LABREF database https://ec.europa.eu/social/main.jsp?catId=1143langId=enLABREF
[5]See: Directive 97/81/EC.
[6]See Directive 99/70/EC
[7]See: https://ec.europa.eu/commission/presscorner/detail/en/ip$_2$1$_6$620

reduction in the unemployment rate. However, these reforms do not always lead to job creation, as temporary jobs might substitute permanent jobs. Thus, promoting temporary contracts may not reduce the unemployment rate but even increase it [Blanchard and Landier, 2002, Cahuc and Postel-Vinay, 2002]. The recent meta-analysis from Brancaccio et al. [2020] indicates that most literature regarding this aspect tends to find adverse labour market outcomes of temporary employment.

Atypical forms of work are supposedly a source of employment for specific groups usually excluded from the labour market, such as the elderly, low-skilled, young individuals, or women. Young individuals are over-represented in temporary employment, while part-time work is mainly a gendered issue. In the EU, among workers aged between 15-24 years old, the share of the temporary contract was at 43% in 2018, compared with 12% for 25-54 years old (Eurostat). In the EU, the share of part-time among women in-work is 32% while only 9% of men worked part-time in 2017. The development of these contracts does not necessarily lead to full integration into the labour market of usually excluded subgroups, as being in this contract does not necessarily convert to a more stable labour market attachment. Indeed, individuals can be 'trapped' in an atypical form of employment. The possibility of atypical employment becoming a 'stepping-stone' to more stable work depends notably on the country's labour market regulation and unemployment rates [Brancaccio et al., 2020, Filomena and Picchio, 2022].

About this aspect, atypical employment might thus lead to precariousness [Bourdieu, 1998, Rodgers and Rodgers, 1989]. This means that workers have no control throughout their jobs and are insufficiently covered by collective bargaining arrangements and welfare states. Besides this, atypical workers face what is called a 'double penalty, as they work less but also face lower wages [Booth et al., 2002, Blanchard and Landier, 2002, Gebel, 2010, OECD, 2015, Kahn, 2016]. There is no strict consensus regarding that, as this depends on the type of contract and the sector. Other works go more toward a wage premium for fixed-term contracts [Lass and Wooden, 2019, Albanese and Gallo, 2020]. Part-time workers have fewer earnings as they work few hours, but they also seem to face this 'double penalty' [Bardasi and Gornick, 2008, O'Dorchai et al., 2007].

These factors enhance the risk of poverty of atypical workers. Recent studies showed that atypical workers face higher poverty risk than standard workers [Burgoon and Dekker, 2010, Horemans, 2017, 2018]. First, atypical workers tend to work less, which leads to poverty. Second, they will likely have lower wages than

permanent workers, reinforcing their poverty risk. Meanwhile, atypical workers, in principle, would have more access to benefits, either in-work benefits (child care allowances, tax credit etc.) or other social benefits. All this has to be taken into account in order to understand the phenomenon of poverty among non-standard workers. The composition of households must also be considered, as atypical workers are more in households with partners, which also plays a role in poverty. Thus, the relationship between atypical and poverty is more complex than one might think. The family composition and other sources of income lead to different financial situations [Andress and Lohmann, 2008]. Studying the poverty of atypical workers by taking a snapshot of a period is an incomplete and often biased analysis. Poverty is a dynamic phenomenon as previous poverty causes future poverty [Jenkins, 2011]. Understanding the poverty risk generated by developing an atypical form of work, and controlling for sources of endogeneity, is a crucial issue.

I tackle this endogeneity issue when studying poverty in Chapter 1 of this dissertation. I address the question of the poverty incidence of temporary contracts with a focus on the case of Germany. I provide new insights on how temporary contracts lead to a higher risk of becoming and staying poor and how this differs according to gender and marital status.

In addition to the higher risk of poverty while in work, atypical workers might face difficulties in accessing social security provisions, such as sickness benefits, pensions or unemployment benefits. Matsaganis et al. [2016] found a gap in social security entitlement of up to 30 percentage points between standard and atypical workers in Europe. Jara Tamayo and Tumino [2021] showed that atypical workers are less covered by unemployment benefit systems than standard workers, thus exposing them to poverty in case of job loss.

Unemployment benefits play a major role in protecting workers from poverty and social exclusion and facilitating the transition between different labour market statuses. Nevertheless, unemployment benefits are among the most difficult social protection schemes to access for non-standard workers. These systems are usually designed for standard, full-time workers [Spasova et al., 2017]. In Chapters 2 and 3 of this thesis, where I simulate different reforms of unemployment benefits for European countries, I draw some insights into how unemployment benefits can better protect individuals.

Unemployment benefit systems

Income support for unemployed individuals is crucial to social protection and labour market policies. Unemployment benefit systems insure individuals against the risk of income loss caused by unemployment. From a macroeconomic view, unemployment benefits systems serve as automatic stabilizers, helping to smooth aggregate shocks.

Here we will discuss the underlying theoretical background of unemployment insurance systems and then outline how these systems remain heterogeneous across European countries.

Theoretical background

Theoretical work on optimal unemployment benefits consists of a trade-off between the value of consumption-smoothing via income-smoothing and the cost of moral hazard [Baily, 1978, Chetty, 2006]. Moral hazard in the case of unemployment benefits consists of a reduction of job-search and a disincentive to take a job for unemployment individuals. This literature seeks to determine the optimal level of unemployment insurance that will equalise costs, being the moral hazard, and the benefits, being income-smoothing. The generosity of unemployment benefits generally depends on the duration or the replacement rate level, i.e. the proportion of previous income maintained under unemployment benefits.

There is an extensive literature on the moral hazard issue, showing that the unemployment duration might increase in response to an increase in unemployment benefit generosity [Lalive et al., 2006b, Lalive, 2007, Landais, 2015]. Several papers showed that higher generosity of unemployment benefits affects the duration of unemployment via an increase in reservation wage [Feldstein, 1976, Krueger and Mueller, 2016] and a reduction of job search effort [Krueger and Mueller, 2010, Le Barbanchon, 2016, Le Barbanchon et al., 2019]. It is established empirically that the duration of unemployment increases with the unemployment benefits duration. However, this depends on if individuals are at the beginning or the end of their unemployment spell; they have different reactions. The moral hazard tends to be higher at the beginning of the unemployment spell [Kolsrud et al., 2018]. Unemployment insurance must therefore fulfil two objectives: the income protection of individuals, to maintain consumption levels and prevent individuals from falling into poverty while limiting the disincentive to work. In Chapter 3, I examine how various designs of

joint unemployment benefits for European countries might meet these requirements.

Individuals might increase their unemployment duration due to more generous unemployment benefits due to 'liquidity constraint' [Chetty, 2006]. Unemployment individuals have pressure to find a job, even with low-wage or skills mismatch, as they can not wait to find another job. More extended or more generous unemployment benefits would release the pressure. Chetty [2006] showed that an increase in unemployment benefits affects unemployment duration only for constrained individuals. Thus, unemployment benefits generosity might lead to a disincentive to work, but mostly necessarily due to a moral hazard but more to a relaxed liquidity constraint.

Regarding the consumption-smoothing role of unemployment benefits, some works provided evidence in favour of that. For the US, Gruber [1994] showed that an increase in the replacement rate of unemployment benefits significantly reduces consumption drop. This effect is exceptionally high for individuals without partners and other assets.

Besides the consumption-smoothing, unemployment benefits might also have a redistribution role. As explained by Marceau and Boadway [1994], individuals differ in their skills, leading to different economic outcomes. Unemployment benefits should also be used to reduce dispersion in consumption to get an equitable welfare distribution. Unemployment benefits also have a crucial role in protecting individuals from a loss of income due to a job loss. It has been shown that unemployed individuals have a higher risk of poverty and material deprivation due to a loss of income. About half of unemployed individuals were at risk of poverty in the EU in 2016[8].

Heterogeneity of unemployment benefits in Europe

The accessibility to unemployment benefits and the degree to which unemployment benefit systems effectively protect individuals' income in case of job loss depends notably on the entitlement rules. This entitlement criterion differs across European countries, leading to different inclusiveness of unemployment benefit systems. Usually, it is specified in terms of previous employment or contribution records over a specific reference period. Among many others, the critical characteristics of unemployment benefits influencing this trade-off between income-smoothing and the

[8]Source: Eurostat, https://ec.europa.eu/eurostat/fr/web/products-eurostat-news/-/DDN-20180226-1

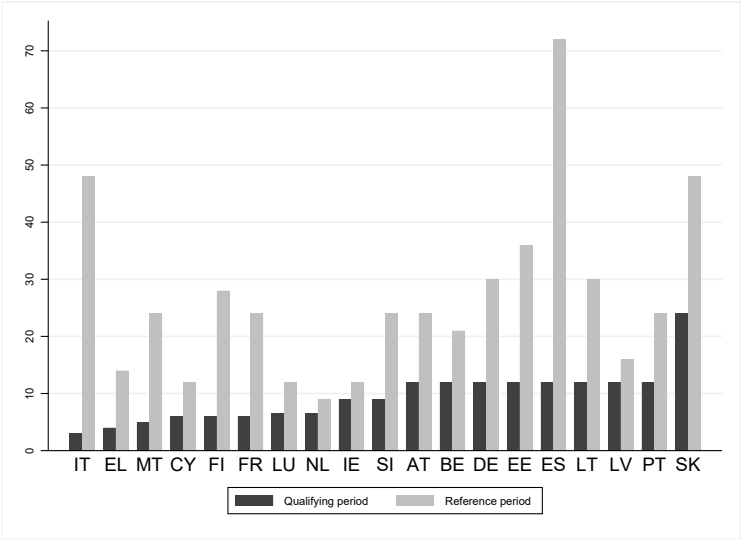


Figure 4: Qualifying requirements and reference period of unemployment benefits in Eurozone countries, in months. (2022)
Source: MISSOC Database

moral hazard of workers are (i) the eligibility conditions, (ii) the duration of benefits and (iii) the level of benefits. Unemployment benefit systems consist of two main instruments: unemployment insurance and unemployment assistance. Unemployment insurance ensures individuals' income, this depends on previous employment duration, and the level of benefits usually are earnings-related. Unemployment assistance is usually means-tested and made for individuals who are not eligible for unemployment insurance or have exhausted their rights to unemployment insurance.

Figure 8 presents the qualifying conditions and reference period of unemployment benefits in terms of months of contribution or employment for Eurozone countries[9]. The accessibility of unemployment benefits differs greatly among European countries. Some countries such as Italy, Greece and Malta have low requirements (below 6 months), sometimes combined with a very long reference period, as for Italy. Spain is also accessible as individuals should have contributed 12 months over the last 72 months. On the contrary, for some countries, being eligible is more challenging such as Slovakia with 24 months or Latvia and Ireland with relatively high qualifying period over a shorter reference period. These disparities inevitably lead to unequal conditions of access to unemployment benefits, thus, unequal protection against the risk of job loss among European countries.

[9]In this thesis, we study and compare unemployment benefit systems of Eurozone countries only as they are concerned by the project of a European unemployment benefit system that we simulate in Chapter 2 and Chapter 3.

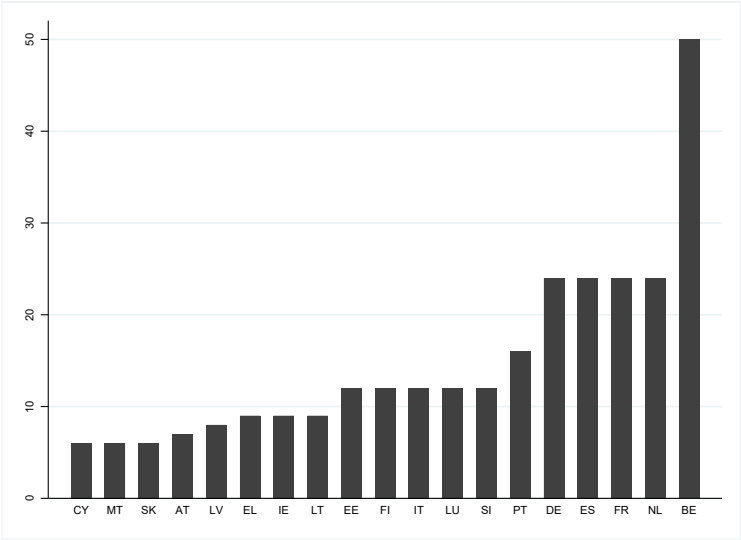


Figure 5: Maximum duration of unemployment benefits in Eurozone countries, in months. (2022)

Source: MISSOC Database

Regarding the generosity of unemployment benefits, the duration and the level of benefits are the two leading indicators shaping the potential income protection effectiveness of unemployment benefits. Figure 9 presents the maximum duration of unemployment benefits. The duration differs across countries, from 6 months in Cyprus, Malta and Slovakia to around 24 months in multiple countries. The unemployment benefit duration is unlimited in Belgium. Maximum duration depends on the previous contributions of the workers but also on the age in many countries.

The level of unemployment benefits, one of the critical features of unemployment benefits, is usually expressed as replacement rates. The calculation rules of the level of unemployment benefit usually depend on previous earnings, except for Ireland, Greece and Malta, where it is a flat amount. For other countries, unemployment benefits are a function of previous earnings, sometimes coupled with a daily fixed amount in the calculation. Unemployment benefit levels are, therefore, proportional to previous earnings. However, some countries have floor and ceiling amounts. This is the case for France, Belgium and Italy, among other countries. In some countries, unemployment benefits are capped to a maximum amount, but no minimum amount is insured for the unemployed.

Several indicators exist to assess the accessibility, inclusiveness and level of protection of unemployment insurance systems. A way to compare the accessibility of unemployment benefits is a *Coverage rate*, computed as the ratio in percentage

between the number of individuals receiving unemployment benefits over the total number of unemployed individuals[10]. One indicator to measure and compare the generosity of unemployment benefits transfers is the *Net Replacement Rate*. The net replacement rate measures the proportion of income maintained by social benefits in the event of unemployment. It is also used to measure the incentives for unemployed individuals to re-enter the labour market.

Research questions

This context of growing non-standard employment leads to several questions: To what extent do these new forms of employment result in a growing risk of poverty? How can unemployment insurance systems be an effective tool to protect individuals? This thesis contributes to the labour economic literature by analysing two topics of great interest in the current economic climate: the poverty risk of workers and the role of unemployment benefit systems.

This dissertation has two main objectives. The first objective is to apprehend better the risk of poverty faced by atypical workers in Europe. The second objective is to assess the role of unemployment benefits in protecting workers from income loss.

This thesis gathers three essays related to these topics. I investigate, first, the poverty risk associated with temporary contract workers. I study how they might become poor and get trapped in this situation. The objective is to better understand the characteristics influencing the risk of poverty (Chapter 1). This Chapter studies the extent to which temporary contracts, as well as other characteristics, cause poverty. Secondly, I focus on the project of a common unemployment benefit system for the Eurozone countries. By inducing upward convergence between countries, I study how this project could be a tool to better protect workers. I investigate how European unemployment insurance systems perform in coverage and income protection for atypical workers experiencing job loss. I then assess how a common unemployment benefit system would improve the income protection of these workers in case of job loss (Chapter 2). As mentioned in the literature, unemployment benefit systems can not be fully addressed by ignoring the cost part, being the potential disincentive to work. I also provide insights on which specific features of unemployment

[10]The OECD uses a 'pseudo-coverage rate' calculated as the share of unemployment benefit recipients over total unemployment individuals following the ILO definition.

benefits would consist of a good trade-off between reducing poverty and inequalities while limiting negative labour supply (Chapter 3). Chapter 2 and Chapter 3 study *ex-ante* the implication, on individuals' income, of a common European unemployment benefit system.

This thesis aims to modestly inform decision-making on reforms aiming to protect more workers with low labour market attachment, such as unemployment benefit systems.

Outline of the thesis

Chapter 1

The first chapter deals with temporary contract employment incidence in poverty, focusing on the case of Germany. Flexible forms of employment, particularly temporary contracts, have become widely used, especially over the last two decades in Germany, following the Hartz reforms. After 2005, Germany created 2.5 million jobs that were mainly part-time or temporary contracts. The share of temporary employment in Germany was around 10-11% in the 1990s, while it amounted to 14% from 2005 until 2015, when a slight downward trend has been observed.

This type of worker generally faces low wages, fewer job opportunities and, therefore, a higher risk of poverty. There is growing literature on whether promoting this type of contract helps individuals integrate into the labour market, or whether it is more of a trap for unstable jobs. A recent meta-analysis from Filomena and Picchio [2022] highlighted that, in more recent years, the dead-end hypothesis is most likely to prevail when the unemployment rate is high. This means that temporary contract workers tend to be trapped in this type of contract. Most empirical studies find that temporary workers receive lower wages after controlling for job characteristics (see Booth et al. [2002], Blanchard and Landier [2002], Gebel [2010], OECD [2015], Kahn [2016]). However, there is no clear consensus on this issue, as some work provided evidence of a 'wage premium' instead of a 'wage penalty for temporary workers' [Lass and Wooden, 2019, Albanese and Gallo, 2020]. Regarding poverty itself, there is still relatively little evidence in the literature. Recent works have shown that being on temporary contracts is associated with high poverty in European countries [Horemans, 2017, Van Lancker, 2013]. They show that household composition plays a essential role in avoiding poverty. These studies are conducted using cross-sectional

data, thus ignoring biasing factors such as endogeneity. We tackle these limitations by explicitly taking into account the state dependency of poverty in our analysis.

This work aims at providing more insight into the relationship between temporary employment and poverty dynamics. I assess the extent to which temporary contract workers face a higher risk of poverty than standard workers and how factors such as household composition influence this risk. Using the Socio-Economic Panel Survey (SOEP) data, I estimate a correlated dynamic random effects probit model with endogenous initial conditions [Wooldridge, 2005], allowing me to take into account the state-dependency of poverty and controlling for sources of endogeneity. I also investigate differences in poverty dynamics of temporary contracts by gender and marital status. I also provide evidence on how marital status shapes the poverty dynamics of temporary workers, which has not been studied. Results suggest that temporary workers face a higher risk of poverty than permanent workers. I find that the risk of entering and remaining in poverty is particularly high for temporary agency and fixed-term contracts for less than one year workers. I show that depending on the family situation, being on a temporary contract has a different impact on the risk of poverty. Single individuals, especially women, face a considerably higher poverty risk when on a temporary contract. In contrast, being on a temporary contract does not seems to impact the poverty dynamics of in-couple individuals.

Chapter 2

This paper evaluates the potential of a common unemployment insurance benefit for the Economic and Monetary Union (EMU-UI) to improve the income protection of atypical workers, namely those in part-time and temporary contracts. The project of a common benefit system for the Eurozone has been extensively discussed after the Sovereign debt crisis. The current COVID-19 crisis and the ensuing Temporary Support to mitigate Unemployment Risks in an Emergency (SURE) plan has revived the debate.

We focus here on the implications of this project regarding the social protection of atypical workers, specifically temporary contract jobs, part-time work, and self-employment, as they have become more prominent over the last years in EU countries. The share of permanent full-time workers has decreased by four percentage points during the last ten years, according to the Economic and Social Development Report (European Commission, 2018). The European Social Right Pillar which aims

at supporting and promoting fair labour markets and welfare systems and proclaims, under principle 12, that "regardless of the type and duration of their employment relationship, workers, and, under comparable conditions, the self-employed, have the right to fair and equal treatment regarding working conditions, access to social protection and training." which aims at encouraging EU countries to allow more accessible social protection for atypical workers including unemployment benefits.

However, atypical workers are characterised by more limited access to unemployment insurance benefits and are more exposed to the risk of poverty [Jara Tamayo and Tumino, 2021]. Existing unemployment benefit systems differ significantly across European countries in terms of accessibility and generosity [Esser et al., 2013]. The recent debate regarding the value-added of an EMU-UI could be put in perspective with the European Pillar of Social Rights requirements, as it would lead to common minimum standards regarding the protection of all types of workers in the event of unemployment. Using the European tax-benefit microsimulation model EUROMOD with representative microdata for the 19 Eurozone countries, we run the counterfactual scenario on policy year 2018. We simulate individual transitions from work to unemployment and compute the potential coverage, net replacement rates and poverty risk under national and EMU-UI systems.

Our results indicate considerable heterogeneity between EMU countries in terms of the prevalence of atypical workers and accessibility to unemployment benefits for those workers. Our work also highlights the current heterogeneity between EMU countries regarding accessibility to unemployment benefits and the share of income preserved in case of unemployment. Potential coverage of national UI systems tends to be lower on average for atypical workers as it is less than 60% in seven EMU countries for part-time and temporary contract workers. Net replacement rates of national systems are, on average, quite similar across countries for the whole working population but show more considerable variation for temporary contract workers.

We show that introducing an EMU-UI would increase UI systems' potential coverage and replacement rates in all countries but to a smaller extent for countries such as France, Belgium of Austria, characterised by quite generous UI systems. The EMU-UI would fill the current gap between countries such as leading to potential coverage above 70% in all countries and increasing net replacement rates in countries initially less generous. This scheme would also protect many workers from falling into poverty when unemployed, especially in Italy, Estonia and Ireland. Allowing self-employed access to EMU-UI would increase net replacement rates, especially in

Greece, Spain, and Lithuania. It would also significantly protect those workers from poverty. Our analysis allows us to assess the effect of a supranational benefit system for the EMU, usually featured as a potential stabilisation tool. As the EMU-UI seems to increase income protection, we could expect EMU-UI to perform as a good stabilisation tool.

Chapter 3

This paper also investigates the potential effects of European unemployment insurance for the Eurozone countries regarding labour supply response. While considerable literature studies the budgetary and stabilisation effect of an EMU-UI, the impact on the behavioural response to this project has never been investigated.

More broadly, there is little work on the labour supply effects for all workers' types of out-of-work benefits, such as unemployment benefits. We tackle this question by simulating the introduction of an EMU-UI using two different scenarios. We implement an EMU-UI, which would partially replace national systems as it can be topped up by national UI systems when more generous. We also consider an alternative scenario characterised by a complete replacement of national UI systems by a common unemployment benefit system. Using the European tax-benefit microsimulation model EUROMOD with representative microdata for the 19 Eurozone countries, we run the counterfactual scenario on the policy year 2018. We estimate a discrete choice labour supply model and compare labour supply elasticities of wages and non-labour income for all countries. We emphasise the change in terms of hours worked in response to the implementation of the EMU-UI; intensive and extensive margins are covered. We estimate a structural labour supply model using mixed logit modelling for accounting for unobserved heterogeneity with random taste variation. Preferences vary between households according to socio-economic variables such as age, presence of children and presence of elderly.

To our knowledge, no studies have looked at the labour supply implications of introducing an EMU-UI system. Though, in changing both the generosity and the duration of unemployment insurance benefits, an EMU-UI scheme is likely to affect labour supply decisions.

We show that the labour supply implications differ greatly regarding EMU-UI designs. We find that a flat-rate EMU-UI, which tends more towards a Beveridgian

model, would imply a powerful disincentive to work, even though the poverty reduction associated is consequent. A basic EMU-UI, fully contribution-related, would limit the distortions on the labour market in most countries but would have limited effects on poverty and inequality. An EMU-UI with a common replacement rate, articulated with floor and ceiling amounts, would allow for upward convergence as it would strongly reduce poverty and inequality in several countries, especially where poverty rates tend to be high, while not inducing too strong labour supply reduction.

Methodological guidelines

Chapter 1 methodology is based on panel data analysis. The German Socio-Economic Panel (SOEP dataset). This dataset is a longitudinal survey of about 11,000 private households in the Federal Republic of Germany from 1984 to 2020 (released in 2022) and the eastern German länder from 1990 to 2020. The first sample, from 1984, was of almost 6,000 households based on a random multi-stage sampling design. A sample of about 2,200 East German households was added in June 1990, half a year after the fall of the Berlin wall. It gathers information on household composition, employment, occupation, earnings, health and satisfaction indicators [Goebel et al., 2019]. In Chapter 1, we select individuals of working age, from 19 to 64 years, who worked at least two years in the observed period. In addition, we select a sample of individuals who are the primary earner in the household. This leaves us with approximately 160,207 observations. We observe about 5000 individuals per year that we tracked for ten years on average. Among these observations, 143,126 are under a permanent contract, and 17,081 are temporary contract individuals. The use of longitudinal data is essential when studying a topic such as poverty, as it is a dynamic phenomenon. Past poverty status and employment status might affect current poverty. It is, therefore, crucial to track individuals over time. As noted by Ryder [1985], *'A person's past affects his present, and his present affects his future.'* From a statistical standpoint, longitudinal panel data also provide a more robust basis for causal inferences, as they are based on within-variation at the individual level, allowing me to control for unobserved heterogeneity. The scope of Chapter 1 is poverty at the household level. Thus, we based our poverty measure on the indicator of *At-risk of poverty rate* (AROP) following Eurostat. This is a prominent indicator in the European Union. The at-risk-of-poverty rate is the share of people with an equivalised disposable income (after social transfer) below

the at-risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income after social transfers. Individuals are considered poor if their equivalent income is below this value. The equivalised disposable income is the total disposable income (income after tax and transfers) divided by the number of individuals in the household converted using the equivalence scale. In our case, we use the 'OECD modified equivalence scale'[11]

As Chapter 2 and Chapter 3 consist of *ex-ante* evaluation of unemployment benefit reforms, I implemented counterfactual scenarios based on microsimulation techniques. We present here in more detail these techniques.

Microsimulation modelling

'The core purpose of microsimulation models is to understand and manage complexity', as mentioned by O'Donoghue and Dekkers [2018]. This complexity is due to population and policy structure and the complexity of behavioural responses to these policies.

Microsimulation models describe different techniques to simulate a policy's effects on economic agents at the individual level. Therefore, it allows us to evaluate the impact of government policies on individuals or households. This study is done at the micro-level, allowing us to identify outcomes on particular subgroups and calculate macroeconomic outcome indicators. A policy simulation assesses the impact of a change in the economic environment, implied by the policy reform, on a set of activity and welfare indicators. The evaluation of policy reforms could be done *ex-post* or *ex-ante*, the latter, the objective of microsimulation. Guy Orcutt, the founder of microsimulation techniques, exposes that *"Current models of our socio-economic system only predict aggregates and fail to predict distributions of individuals, households, or firms in single or multi-variate classifications."* [Orcutt, 1957].

Using microsimulation techniques in policy evaluation has the advantage of taking into account the heterogeneity of economic agents instead of working with 'representative individuals'. Working with thousands of heterogeneous individuals allows us to better apprehend the implication of policy reforms and perform distributional analysis. This technique allows us to identify individuals who might be the 'losers'

[11]The OECD modified equivalence square assigns a value of 1 for the household head, 0.5 for each household member older than 14 years old and 0.3 for each child. See Hagenaars et al. [1994] for more details.

and the 'winners' of some reforms [Bourguignon and Spadaro, 2006]. Another advantage of microsimulation techniques is that tax rules and rules determining who is eligible for some benefits are usually highly nonlinear and sometimes have discontinuous jumps. Microsimulation models relatively easily fit such functional forms [Klevmarken, 2001].

Microsimulation modelling ignoring behavioural implication, usually characterised as *arithmetical models*, applies change in budget constraint of individuals induced by the policy reform. This modelisation allows us to study the distributional implication of a specific policy. In Chapter 2, we apply this analysis, working with a set of indicators to evaluate the effects of the policy. Going a step further in the analysis, *behavioural* microsimulation takes into account the behavioural responses of individuals, due to a change in their budget constraint, in terms of labour supply or savings, for example. This can be done through the estimation of *structural econometric models*. Structural models identify the underlying structural parameters governing individuals' behaviour. They allow predictions of how a changing environment, such as a policy change, affects the behaviour of individuals. We develop a structural labour supply model for Eurozone countries in Chapter 3 to integrate individuals' behavioural responses to unemployment benefits reforms. In this dissertation, I use the microsimulation model EUROMOD[12], a multi-country model for the European countries, based on representative household micro-data, the European Statistics on Income and Living Conditions (EU-SILC). EU-SILC is an annual survey providing microdata on various social indicators such as income, poverty, social exclusion and living conditions. More precisely, we use the EUROMOD dataset derived from EU-SILC. We use EUROMOD datasets for 2016. The EUROMOD modelisation uses detailed information on household composition, characteristics of household members and their incomes from the EU-SILC to create common definitions of income concepts that allow for a very detailed and harmonised micro–level calculation of taxes and benefits. In Chapter 2 and Chapter 3, we restrict our sample to individuals aged between 16 to 64 years old who are neither students, disabled or retired. Individuals are surveyed every year, which allows us to track long-term psychological, economic, societal, and social developments. EUROMOD allows cross-country comparisons of tax-benefit instruments and analyses the impact of common changes across countries Figari et al. [2007]. We carry out both analyses here in Chapter 2 and Chapter 3.

[12]For more information, see Sutherland and Figari [2013]

Introduction générale

Au cours des deux dernières décennies, les marchés du travail européens se sont détournés de l'emploi standard à temps plein et à durée indéterminée au profit de formes d'emploi plus flexibles. Cette évolution est en partie la conséquence des récentes crises économiques, ainsi que des changements technologiques ou démographiques, qui ont conduit à un essor de ces nouvelles formes d'emploi.

Les travailleurs atypiques ou non-standards, correspondent aux formes d'emploi qui divergent des contrats standards à temps plein et à durée indéterminée. Cette définition englobe les emplois en contrat temporaire, à temps partiel ainsi que le travail indépendant[13]. Ces individus travaillent généralement moins de temps sur l'année et sont également confrontés à des risques plus élevés de précarité et de pauvreté. En outre, les systèmes de protection sociale, étant basés sur un système par cotisations, sont souvent conçus pour l'emploi standard à temps-plein. Cela résulte sur un accès plus difficile à ces prestations pour les emplois non-standards [OCDE, 2018]. Par conséquent, les systèmes de protection sociale, principalement assurantiels, doivent s'adapter aux formes d'emploi flexibles, afin d'être plus accessible.

La crise récente du COVID-19 a révélé des insuffisances dans l'accès des travailleurs à la protection sociale et de nombreux pays ont dû étendre d'urgence les conditions d'accès aux allocations de chômage notamment. Pendant la crise, dix pays européens ont assoupli les critères d'éligibilité à l'allocation chômage, afin de permettre à davantage de travailleurs d'y avoir accès. Les pays européens ont notamment été encouragés à accroître l'inclusivité de leurs systèmes de protection sociale dans le cadre du Socle Européen des Droits Sociaux. La Directive européenne (2019/C 387/01)[14] réaffirme que *"regardless of the type and duration of their employment re-*

[13]Les concepts de travail atypiques ou non-standards sont des définitions adoptées par l'Organisation internationale du travail ou encore l'Organisation de Coopération et de Développement Economique (OCDE), see https://www.ilo.org/global/topics/non-standard-employment/lang–en/index.htm, and the European Commission [2016] and OCDE [2018]

[14]Pour plus de détails, voir https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019H1115(01)

lationship, workers, and, under comparable conditions, the self-employed, have the right to fair and equal treatment regarding working conditions, access to social protection and training.".

Cette thèse contribue à cette réflexion. Elle propose des éléments de réponse à deux questionnements : Dans quelle mesure ces formes d'emploi atypique impliquent-elles un risque accru de pauvreté pour les travailleurs ? Comment les systèmes d'assurance chômage peuvent-ils servir d'outil pour mieux protéger les individus ?

Le chapitre 1 aborde la première question. Ce chapitre se concentre sur un type de travailleurs atypiques, à savoir les travailleurs en contrat temporaire, et évalue le risque de pauvreté associé à ce type d'emploi. Les deux chapitres suivants traitent de la deuxième question. Le chapitre 2 évalue comment les systèmes d'assurance chômage pourraient être plus accessibles et mieux protéger les travailleurs atypiques en cas de perte d'emploi. Le chapitre 3 étudie les effets redistributifs et les implications sur l'offre de travail de plusieurs réformes d'assurance chômage, pour tous les types de travailleurs.

Dans la suite de cette introduction, je présenterai d'abord le développement de l'emploi atypique en Europe et les questions actuelles que cela peut susciter, tant dans les débats politiques qu'académiques. Ensuite, la deuxième partie se concentrera sur le second objet d'étude de cette thèse, à savoir le rôle des systèmes d'assurance chômage et leur fonctionnement. Je présenterai ensuite les objectifs de recherche et les méthodes mobilisées. La dernière partie détaillera les différents chapitres qui composent cette thèse.

Nouvelles formes d'emploi dans les pays européens

Les emplois en contrat temporaires, à temps-partiel, ainsi que le travail indépendant (particulièrement les auto-entrepreneurs) ont gagné en importance au cours des dernières décennies. Ces formes d'emploi sont appelées non-standards ou atypiques, par opposition à l'emploi standard, correspondant aux contrats à temps plein à durée indéterminée, avec un seul employeur.

Le travail temps partiel est défini par Eurostat comme une relation d'emploi dans laquelle les heures habituelles de travail sont inférieures à celles d'un travailleur à temps plein comparable [Bollé, 1997]. D'autres définitions peuvent être basées sur un seuil d'heures de travail. La définition de l'OCDE de travailleurs à temps partiel est basée sur le fait de travailler moins de 30 heures par semaine dans son emploi

principal[15]. L'emploi temporaire correspond aux travailleurs qui ne sont embauchés que pour une période de temps spécifique. La majorité des contrats temporaires sont des contrats à durée déterminée, mais il en existe d'autres types, comme les contrats de mission, ou encore le travail saisonnier. Cela inclut ainsi le travail en intérim, où les travailleurs sont employés par une agence pour effectuer une mission dans une entreprise cliente. Le travail intérimaire reste relativement marginal (2,1% des salariés âgés de 20 à 64 ans dans l'UE en 2019), bien qu'il s'agisse d'un type de contrat en augmentation dans de nombreux pays.

Les travailleurs indépendants correspondent aux individus qui exercent à leur compte une activité économique, en supportant les risques de cette activité et en s'appropriant les profits éventuels qu'elle peut générer. En 2021, 13% des salariés âgés de 20 à 64 ans dans l'UE étaient indépendants. Plus des deux tiers des travailleurs indépendants (68,2%) de l'UE étaient des auto-entrepreneurs, tandis que 31,8% étaient employeurs.

Comme indiqué précédemment, les marchés du travail ont évolué en faveur de ce type d'emploi. La part des travailleurs standard a diminué de 4 points de pourcentage entre 2002 et 2016, s'élevant à 59% de l'emploi total en 2016 [European Commission, 2018b]. Dans l'UE, les emplois à temps partiel représentaient 17,7% de l'emploi total en 2021. Entre 2002 et 2020, la part des travailleurs à temps partiel dans l'UE a augmenté de 4 points de pourcentage (figure 6). Les contrats temporaires représentaient 12,1% de l'emploi total en 2021 dans l'UE. La part des travailleurs indépendants s'élevait à 13% en 2021. Depuis 2000, l'emploi temporaire constitue la majeure partie de la création d'emplois en Europe. La fréquence des travailleurs indépendants reste assez stable au cours des dernières décennies, tandis que la durée de leur contrat tend à se raccourcir [Vacas-Soriano et al., 2015]. Les auto-entrepreneurs en particulier ont fortement progressé ces dernières années.

Si la part d'emploi atypique s'est accrue de manière générale dans l'UE, la prévalence des différentes formes d'emploi reste très hétérogène entre les pays (Voir le graphique 7). La part de l'emploi temporaire s'élève jusqu'à plus de 20% aux Pays-Bas et en Espagne, alors qu'elle se situe entre 3 et 15% dans les autres pays de l'UE. L'emploi à temps partiel est très répandu aux Pays-Bas, en Autriche et en Allemagne, où environ un tiers de la population active est à temps partiel. La proportion de travailleurs à temps partiel a particulièrement augmenté au cours des années 2000 pour ces trois pays. La part des travailleurs indépendants par rapport à

[15]See https://data.oecd.org/emp/part-time-employment-rate.htm

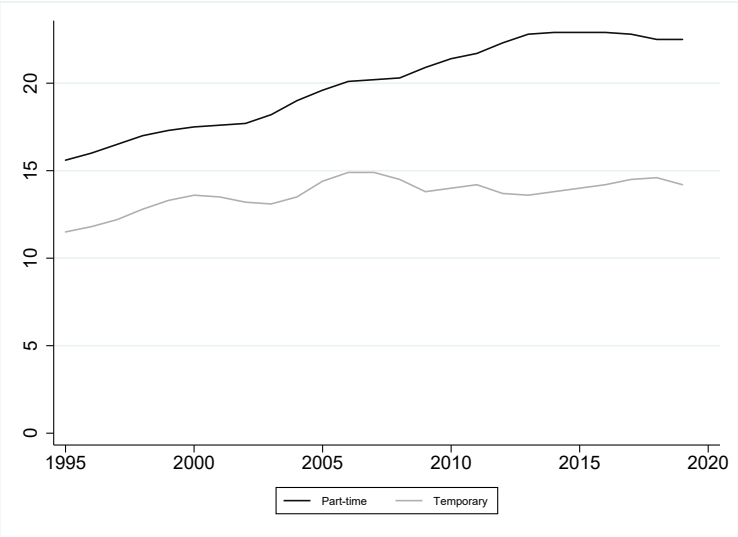


Figure 6: Evolution des contrats temporaires et à temps partiel (EU-15)
Source: Eurostat
Note: Ce graphique représente la proportion des contrats temporaires, et à temps partiels entre 2002 et 2019 pour la moyenne des pays de l'UE-15. Les emplois à temps partiel sont exprimés en pourcentage de l'emploi total et les contrats temporaires en part des salariés totaux.

l'emploi total varie également fortement d'un pays à l'autre. Ce type de travailleurs est très répandu en Grèce, représentant près de 28% de l'emploi, mais aussi en Italie ou en Pologne. En revanche, il est encore assez peu répandu en Allemagne, au Danemark et au Luxembourg.

Cette présence accrue des travailleurs atypiques est en partie une conséquence des réformes qui encouragent ce type d'emploi, dans le but d'accroître la flexibilité des entreprises et de réduire le chômage.

Au début des années 2000, certains pays tels que la Belgique, l'Allemagne, la France, l'Italie, l'Espagne et la Suède ont facilité l'utilisation de contrats temporaires[16]. Une résurgence de ce type de réformes a eu lieu depuis les années 2010, notamment pour les pays fortement touchés par la crise comme la Grèce, le Portugal ou l'Espagne.

Ces réformes depuis les années 2000 ont notamment découlé de directives européenne, visant à promouvoir l'emploi flexible tout en fixant des normes communes en termes de protection de l'emploi. La Directive européenne de 1998footnoteSee : Directive 97/81/CE. visait à promouvoir le temps partiel, à limiter la discrimination à l'égard de ces travailleurs et à améliorer leurs conditions de travail. En 1999, la

[16]Voir base de données LABREF https://ec.europa.eu/social/main.jsp?catId=1143langId=enLABREF

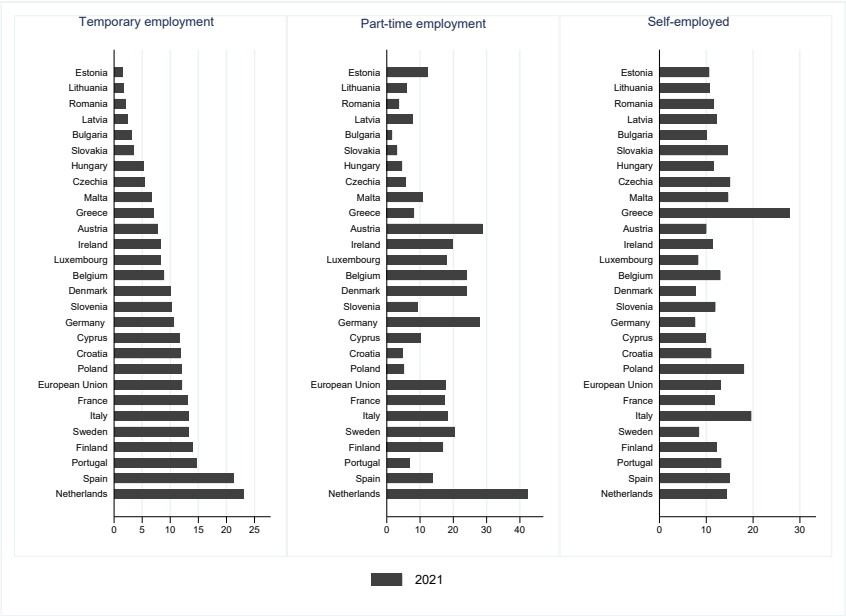


Figure 7: Part des travailleurs atypiques sur l'emploi total, par sous-groupes de contrats pour 2021

Source: Eurostat

Note: Ce graphique représente la proportion de travail temporaire, à temps partiel et indépendant sur l'emploi total pour les pays européens.

Commission Européenne a adopté une directive sur le travail à durée déterminée ([17] qui consiste à éviter l'utilisation abusive des contrats temporaires. Suite à cette mesure, les pays européens ont mis en place une durée maximale et une limitation du nombre de renouvellement des contrats temporaires, bien que ces durées maximales diffèrent encore beaucoup entre les pays. Par exemple, en 2003, l'Allemagne a étendu la durée maximale de 2 à 4 ans et le Portugal est allé jusqu'à 6 ans, alors que celle-ci est d'environ 3 ans dans de nombreux autres pays. Une directive plus récente, concernant plus spécifiquement le travail intérimaire, a été adoptée en 2008. Cette directive vise à renforcer la protection des travailleurs intérimaires en leur garantissant une "égalité de traitement" (égalité de conditions et de rémunération) entre eux et les salariés pour le même travail dans la même entreprise. Cependant, la protection est très limitée par rapport aux deux directives précédentes, puisqu'aucune durée maximale ou renouvellement ne doit être imposée. De plus, cette directive permet explicitement de déroger à cette égalité de traitement, si les partenaires sociaux y consentent [O'Connor, 2013]. Pour les indépendants, il n'existe pas encore de directives européennes spécifiques ni de normes communes entre les pays européens. Un

[17] See : Directive 99/70/CE

accord sur les conditions de travail des indépendants est en cours d'élaboration[18]) en réponse à l'essor des emplois de plate-forme, qui ont soulevé de nombreux questionnements quant à leurs conditions de travail.

Comme mentionné précédemment, la promotion de ce type de contrat est motivée par des objectifs de lutte contre le chômage et la possibilité pour les entreprises d'adapter le nombre d'employés aux fluctuations de l'activité. Par exemple, Katz et al. [1999] a montré que la croissance des emplois temporaires aux États-Unis au cours des années 1990 a permis de réduire de 0,4 point le taux de chômage. Cependant, ces réformes ne conduisent pas toujours à la création d'emplois, car les emplois permanents peuvent être remplacés par des emplois temporaires. Ainsi, la promotion des contrats temporaires peut ne pas réduire le taux de chômage, voire l'augmenter [Blanchard and Landier, 2002, Cahuc and Postel-Vinay, 2002]. La récente méta-analyse de Brancaccio et al. [2020] indique que la majorité de la littérature concernant cet aspect indique des effets majoritairement négatifs de l'emploi temporaire sur les perfomances du marché du travail.

L'emploi atypique est censé être une source d'intégration au marché du travail pour des groupes spécifiques habituellement exclus de celui-ci, tels que les personnes âgées, les personnes peu qualifiées, les jeunes ou les femmes. Les jeunes sont surreprésentés dans les emplois temporaires, tandis que le travail à temps partiel est principalement une problématique liée au genre. Dans l'UE, parmi les travailleurs âgés de 15 à 24 ans, la part de contrat temporaire était de 43% en 2018, contre 12% pour les 25-54 ans (Eurostat). Dans l'UE, la part de temps partiel chez les femmes actives est de 32% alors que seulement 9% des hommes travaillaient à temps partiel en 2017. Ce formes d'emploi ne conduisent pas nécessairement à une intégration complète sur le marché du travail de ces groupes habituellement exclus. En effet, exercer ces emploi n'implique pas toujours un ancrage plus stable au marché du travail. Les individus peuvent être "piégés" dans une forme d'emploi atypique. La possibilité pour l'emploi atypique d'être un "tremplin" vers un emploi plus stable dépend notamment de la réglementation du marché du travail du pays et des taux de chômage [Brancaccio et al., 2020, Filomena and Picchio, 2022].

Au vu de ce constat, l'emploi atypique pourrait ainsi conduire à une situation de précarité [Bourdieu, 1998, Rodgers and Rodgers, 1989]. Cela signifie que les travailleurs n'ont aucun contrôle sur la durée de leur emploi et qu'ils ne sont pas suffisamment couverts par les accords de négociation collective ainsi que les presta-

[18](voir : https://ec.europa.eu/commission/presscorner/detail/en/ip$_2$1$_6$620

tions de l'Etat. En outre, les travailleurs atypiques ont tendance à être confrontés à ce qui est appelé une "double peine", puisqu'ils travaillent moins, mais ont également tendance à faire face à des salaires plus faibles [Booth et al., 2002, Blanchard and Landier, 2002, Gebel, 2010, OECD, 2015, Kahn, 2016]. Il n'y a cependant pas de consensus strict à ce sujet, car cela dépendrait du type de contrat et du secteur. D'autres travaux vont plutôt dans le sens d'un salaire plus élevé pour les contrats à durée déterminée [Lass and Wooden, 2019, Albanese and Gallo, 2020]. Les travailleurs à temps partiel ont évidemment moins de revenus puisqu'ils travaillent moins d'heures, et ont tendance à avoir des salaires plus faibles [Bardasi and Gornick, 2008, O'Dorchai et al., 2007].

Ces facteurs augmentent le risque de pauvreté associé à ces emplois. Des études récentes ont montré que les travailleurs atypiques sont confrontés à un risque de pauvreté plus élevé que les travailleurs standards [Burgoon and Dekker, 2010, Horemans, 2017, 2018]. Premièrement, les travailleurs atypiques sont généralement en emploi moins longtemps sur l'année, ce qui conduit, de façon plutôt évidente, à la pauvreté. Ensuite, ils sont susceptibles d'avoir un salaire inférieur à celui des travailleurs permanents, ce qui renforce leur risque de pauvreté. Parallèlement, les travailleurs atypiques semblent en principe avoir davantage accès aux prestations sociales, qu'il s'agisse de prestations liées au travail (telles que les allocations de garde d'enfants, prime d'activité etc.) ou d'autres prestations sociales. Il semble donc essentiel de tenir compte de cela pour comprendre le phénomène de pauvreté chez les travailleurs atypiques. La composition du ménage joue aussi un rôle considérable, étant donné que les travailleurs atypiques peuvent aussi être sur-représentés au sein des couples, ce qui joue également un rôle dans les déterminants de la pauvreté. Ainsi, le lien entre ces formes d'emploi et la pauvreté n'est pas aussi axiomatique qu'on pourrait le penser. La composition du ménage ainsi que d'autres sources de revenus conduisent à des situations financières diverses [Andress and Lohmann, 2008]. Étudier la pauvreté des travailleurs atypiques en se basant sur une analyse en coupe transversale, en observant uniquement une année donnée, induit une analyse incomplète et des résultats souvent biaisés. La pauvreté est un phénomène dynamique, étant donné qu'être en situation de pauvreté à un instant donné accroît le risque d'être pauvre dans le futur. Comprendre comment les emplois atypiques causent une situation de pauvreté, en contrôlant pour les sources d'endogénéité, est une question cruciale qui mérite davantage d'attention.

J'aborde ce problème d'endogénéité dans l'étude de la pauvreté au chapitre 1

de cette thèse. J'étudie la question de l'incidence des contrats temporaires sur la pauvreté en me concentrant sur le cas de l'Allemagne. J'apporte un nouvel éclairage sur la façon dont les contrats temporaires impliquent un risque plus élevé de devenir, mais aussi de rester pauvre. J'intègre également la dimension du genre et de la composition du ménage dans mon analyse.

Au-delà du risque de pauvreté en emploi, les travailleurs atypiques peuvent être confrontés à des difficultés d'accès aux prestations de sécurité sociale, telles que les indemnités maladie, les pensions de retraite ou les allocations chômage. Matsaganis et al. [2016] a constaté un écart de 30 points de pourcentage dans le taux d'accès aux prestations de protection sociale entre les travailleurs standards et atypiques en Europe. **?** a montré que les travailleurs atypiques tendent à être moins couverts par les systèmes d'allocations chômage que les travailleurs standards, ce qui les expose à une pauvreté accrue en cas de perte d'emploi.

Les allocations chômage jouent un rôle majeur dans la protection des travailleurs contre la pauvreté et l'exclusion sociale. Ils facilitent la transition entre différents statuts sur le marché du travail. Pourtant, les systèmes d'assurance chômage comptent parmi les régimes de protection sociale les plus difficiles d'accès pour les travailleurs atypiques. Ces systèmes sont généralement conçus pour les travailleurs standard, à temps plein [Spasova et al., 2017]. Dans les chapitres 2 et 3 de cette thèse, où je simule différentes réformes d'assurance chômage pour les pays de la zone euro, je tire quelques enseignements sur la manière dont les allocations chômage peuvent mieux protéger les individus.

Les systèmes d'assurance chômage en Europe

Le maintien du revenu des individus sans emploi est un élément clé des politiques de protection sociale et du marché du travail. Les systèmes d'assurance chômage assurent les individus contre le risque de perte de revenu causé par le chômage. D'un point de vue macroéconomique, les systèmes d'assurance chômage jouent le rôle de stabilisateurs automatiques, contribuant à atténuer les chocs macroéconomiques.

Nous aborderons ici le contexte théorique sous-jacent du rôle de l'assurance chômage, puis nous soulignerons comment ces systèmes restent hétérogènes entre les pays européens.

Contexte théorique

Les travaux théoriques sur l'assurance chômage optimale consistent en un compromis entre son coût en termes d'aléa moral et ses bénéfices en termes de lissage de la consommation [Baily, 1978, Chetty, 2006]. Dans le cas de l'assurance chômage, l'aléa moral consiste en une réduction de la recherche d'emploi et une désincitation à accepter un nouvel emploi pour les personnes au chômage. Cette littérature cherche à déterminer le niveau optimal d'assurance chômage qui égalisera les coûts, soit l'aléa moral, et les bénéfices, soit le lissage des revenus. La générosité des allocations chômage dépend généralement de la durée ou du taux de remplacement. Le taux de remplacement correspond à la part en pourcentage du revenu précédent qui est maintenu en indemnisation chômage.

Il existe une littérature abondante sur la question de l'aléa moral, montrant que la durée du chômage pourrait augmenter en réponse à une augmentation de la générosité des allocations chômage [**?**Lalive, 2007, Landais, 2015]. Plusieurs articles ont montré qu'une plus grande générosité des allocations chômage affecte la durée du chômage via une augmentation du salaire de réserve [Feldstein, 1976, Krueger and Mueller, 2016] et une réduction de l'effort de recherche d'emploi [Krueger and Mueller, 2010, Le Barbanchon, 2016, Le Barbanchon et al., 2019]. Il est établi empiriquement que le temps passé au chômage augmente avec la durée des allocations. Cependant, cela dépend aussi du fait que les individus se trouvent au début ou à la fin de leur période de chômage. L'aléa moral a tendance à être plus élevé au début de la période de chômage [Kolsrud et al., 2018]. L'assurance chômage doit donc remplir deux objectifs : la protection du revenu des individus, à savoir maintenir le niveau de consommation et empêcher les individus de tomber dans la pauvreté, tout en limitant la désincitation au travail. Dans le chapitre 3, j'examine comment différentes conceptions d'allocations de chômage communes aux pays européens pourraient répondre à ces exigences.

Les individus augmentent leur temps passé au chômage suite une générosité accrue des allocations notamment pour des raisons de "contrainte de liquidité" [Chetty, 2006]. Les chômeurs sont poussés à trouver un emploi, même faiblement rémunéré ou avec une inadéquation des compétences. En effet, ils sont parfois dans l'impossibilité d'attendre de trouver un autre emploi plus adéquat, car constraints financièrement. Des indemnisations chômage plus généreuses ou versée plus longtemps, permettraient de relâcher cette pression. Chetty [2006] a effectivement montré qu'une augmentation des allocations chômage a un effet sur sa durée uniquement pour les individus

subissant cette contrainte de liquidité. Ainsi, la générosité des allocations de chômage pourrait dissuader de travailler, pas nécessairement en raison d'un aléa moral mais plutôt d'une contrainte financière relâchée.

En ce qui concerne le rôle de lissage de la consommation de l'assurance chômage, certains travaux ont démontré empiriquement ces effets. Pour les Etats-Unis, Gruber [1994] a montré qu'une augmentation du taux de remplacement des allocations chômage limite significativement la baisse de la consommation. Cet effet étant particulièrement élevé pour les individus sans partenaire et sans autres actifs au sein du ménage.

Outre le lissage de la consommation, l'assurance chômage peut également jouer un rôle de redistribution. Comme l'explique Marceau and Boadway [1994], les individus diffèrent dans leurs compétences, ce qui entraîne des situations économiques différentes. L'assurance chômage peut également être un outil pour réduire la dispersion de la consommation ainsi que du revenu, afin d'obtenir une distribution équitable du bien-être. L'assurance chômage joue également un rôle clé dans la protection des individus contre un manque de revenus induit par la perte d'un emploi. Il a été démontré que les individus sans emploi font face à un risque plus élevé de pauvreté et de privation matérielle, en raison de la perte de revenus. Autour de la moitié des personnes au chômage étaient à risque de pauvreté dans l'UE en 2016[19].

L'hétérogénéité des systèmes d'assurance chômage en Europe

L'accessibilité et le degré d'efficacité de l'assurance chômage dans la protection du revenu des individus en cas de perte d'emploi dépendent notamment des règles d'éligibilité. Ces critères d'éligibilité diffèrent d'un pays européen à l'autre, ce qui conduit à des systèmes d'assurance chômage plus ou moins inclusifs. Généralement, les règles d'éligibilté sont spécifiées en termes de mois de cotisation antérieurs ou d'historique d'emploi sur une période de référence spécifique. Les principales caractéristiques des allocations de chômage qui influencent cet arbitrage entre lissage des revenus et aléa moral des travailleurs sont, parmi beaucoup d'autres, les suivantes : (i) les conditions d'éligibilité (ii) la durée des prestations et (iii) le montant des prestations. Les systèmes d'indemnisation du chômage se composent de deux instruments principaux : l'assurance chômage et l'assistance chômage. L'assurance chômage as-

[19]Source : Eurostat, https://ec.europa.eu/eurostat/fr/web/products-eurostat-news/-/DDN-20180226-1

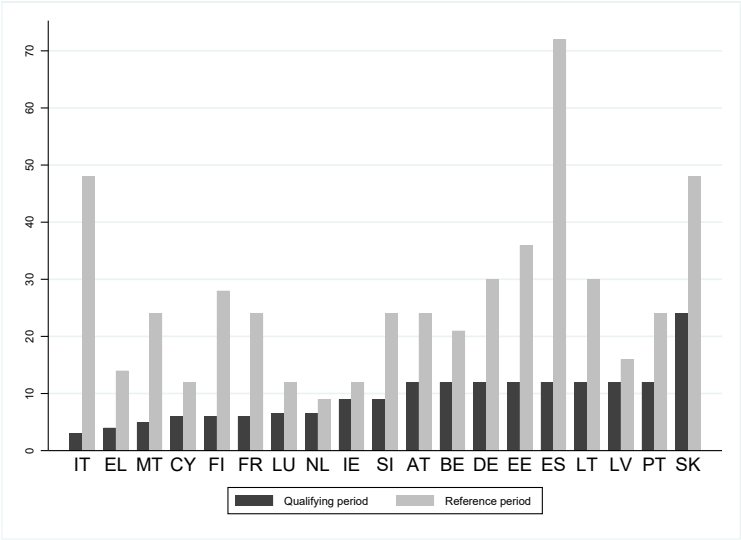


Figure 8: Critères d'éligibilité et période de référence des systèmes d'assurance chômage dans les pays de la zone Euro (2022)
Source: Base de données MISSOC

sure le revenu des individus, ce qui dépend de la durée de l'emploi précédent et le niveau des prestations est généralement lié aux précédents revenus. L'assistance chômage est généralement soumise à des conditions de ressources et est destinée aux personnes qui n'ont pas ou plus de droit à l'assurance chômage.

Le graphique 8 présente les conditions d'éligibilité, exprimés en nombre de mois, et la période de référence à laquelle s'applique ces conditions, pour les pays de la zone euro[20]. L'accessibilité des systèmes d'assurance chômage diffère fortement entre les pays de la zone Euro. Certains pays comme l'Italie, la Grèce et Malte ont des critères relativement peu exigents (moins de 6 mois de cotisation nécessaires), parfois combinées à une période de référence très longue, comme pour l'Italie. L'assurance chômage en Espagne est relativement facile d'accès étant donné que les individus doivent avoir cotisé 12 mois au cours des 72 derniers mois. Au contraire, pour certains pays, il est plus difficile d'être éligible, comme la Slovaquie avec 24 mois de cotisation ou encore la Lettonie et l'Irlande avec une période de qualification relativement élevée sur une période de référence restreinte. Ces disparités conduisent inévitablement à des conditions d'accès aux indemnisations chômage inégales, et donc à une protection inégale contre le risque li" à la perte d'emploi entre les pays européens.

Concernant la générosité de l'assurance chômage, la durée et le niveau des presta-

[20]Dans cette thèse, nous étudions et comparons les systèmes d'allocations chômage des pays de la zone euro uniquement, étant donné que notre analyse est basée sur le projet de système européen d'assurance chômage pour ces pays, que nous simulons dans les chapitres 2 et 3.

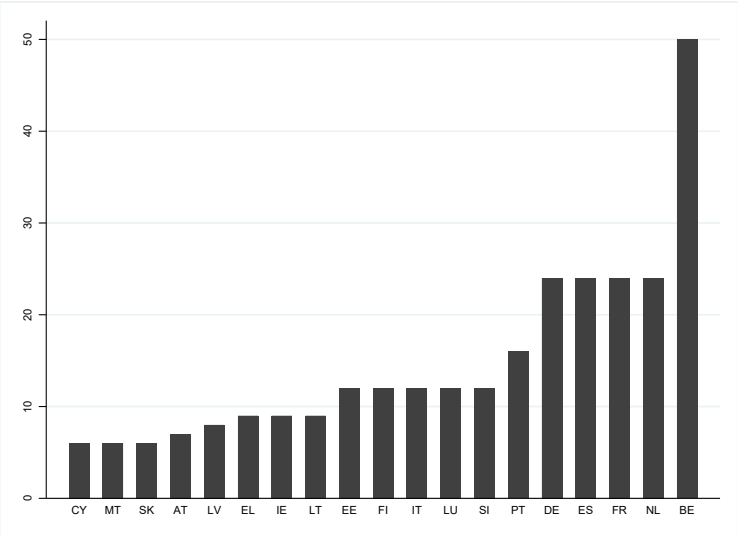


Figure 9: Durée maximale de versement des allocations chômage dans les pays de la zone euro exprimés en mois (2022)
Source: Base de données MISSOC

tions sont les deux principaux indicateurs qui déterminent l'efficacité de l'assurance chômage en matière de protection du revenu. Le graphique 9 représente la durée maximale des allocations chômage dans les différents pays. Celle-ci est hétérogène entre les pays, allant de 6 mois maximum pour Chypre, Malte et la Slovaquie jusqu'à environ 24 mois dans plusieurs pays. La durée des prestations d'assurance chômage est illimitée en Belgique. La durée maximale dépend des cotisations antérieures des travailleurs mais aussi de l'âge de l'individu pour de nombreux pays.

Le niveau des prestations chômage est généralement exprimé sous forme de taux de remplacement, correspondant à la proportion du revenu antérieur maintenu dans le cadre des indemnités chômage. Les règles de calcul du niveau des allocations dépendent généralement des revenus antérieurs, sauf en Irlande, en Grèce et à Malte où il s'agit d'un montant forfaitaire. Pour les autres pays, le montant des allocations est fonction des revenus antérieurs, parfois couplées à un montant forfaitaire journalier ou hebdomadaire. C'est le cas entre autres de la France, de la Belgique et de l'Italie. Dans certains pays, les allocations chômage sont plafonnées à un montant maximum mais il n'y a pas de montant minimum assuré pour les chômeurs.

Plusieurs indicateurs existent pour évaluer l'accessibilité, l'inclusion et le niveau de protection des systèmes d'assurance chômage. Un moyen de comparer l'accessibilité des allocations chômage est le *Taux de couverture*, calculé comme le rapport en pourcentage entre le nombre de personnes recevant effectivement des allocations chômage

et le nombre total de personnes sans emploi. L'OCDE se base sur un 'pseudo-taux de couverture', calculé comme la part des bénéficiaires d'allocations chômage par rapport au nombre total de personnes sans emploi, selon la définition de l'OIT. Pour mesurer et comparer la générosité des transferts d'allocations chômage, un indicateur fréquemment utilisé est le *Taux de remplacement net*. Le taux de remplacement net mesure la proportion du revenu maintenu par les prestations sociales en cas de perte d'emploi. Il est également utilisé pour mesurer l'incitation des chômeurs à réintégrer le marché du travail.

Je me base sur ces indicateurs pour comparer les perfomances des systèmes d'assurance chômage et évaluer les effets de différentes réformes, dans les chapitres 2 et 3.

Questions de recherche

Ce contexte de croissance des formes atypiques d'emploi conduit à plusieurs interrogations : Dans quelle mesure ces nouvelles formes d'emploi entraînent-elles un risque croissant de pauvreté ? Comment les systèmes d'assurance chômage peuvent-ils être un outil efficace pour protéger les individus ? Cette thèse contribue à la littérature économique en analysant deux thématiques d'intérêt majeur dans le climat économique actuel, à savoir le risque de pauvreté des travailleurs et le rôle des systèmes d'assurance chômage.

Cette thèse a deux objectifs principaux. Le premier objectif est de mieux appréhender le risque de pauvreté auquel sont confrontés les travailleurs atypiques en Europe. Le second objectif est d'évaluer le rôle de systèmes d'assurance chômage dans la protection des travailleurs contre la perte de revenu.

Cette thèse rassemble trois essais liés à ces sujets. J'étudie tout d'abord le risque de pauvreté associé aux travailleurs en contrats temporaires. J'analyse leur risque de faire face à une situation de pauvreté, mais aussi de rester dans cette situation. L'objectif est de mieux comprendre les caractéristiques qui influencent le risque de pauvreté des travailleurs en contrat temporaire (Chapitre 1). Deuxièmement, je me concentre sur le projet d'un système commun d'allocation chômage pour les pays de la zone euro. J'étudie comment ce projet, en induisant une convergence vers le haut entre les pays, pourrait être un outil pour protéger davantage les travailleurs en cas de perte d'emploi. J'étudie notamment les performances des systèmes

d'assurance chômage existants en Europe en matière de couverture et de protection des revenus des travailleurs atypiques. J'évalue ensuite comment un système commun d'assurance chômage améliorerait la protection du revenu de ces travailleurs en cas de chômage (Chapitre 2). Comme mentionné dans la littérature, les systèmes d'allocations de chômage ne peuvent pas être abordés dans leur intégralité en ignorant la partie coût, à savoir les effets comportementaux sur les agents. J'apporte des éclairages sur les caractéristiques de l'assurance chômage qui permettent un arbitrage entre réduction des inégalités et limiter les effets négatifs sur les incitations à travailler (Chapitre 3). Les chapitres 2 et 3 étudient *ex-ante* l'implication, sur le revenu des individus d'un système européen commun d'allocations chômage.

L'objectif de cette thèse est d'éclairer modestement les décideurs publics sur des réformes de politiques d'assurance chômage, visant à protéger davantage de travailleurs en emploi atypique.

Présentation des chapitres

Chapitre 1

Le premier chapitre traite de l'incidence de l'emploi en contrat temporaire sur la pauvreté en se concentrant sur le cas de l'Allemagne. Les formes d'emploi flexibles, en particulier les contrats temporaires, sont devenues largement utilisées, principalement au cours des deux dernières décennies en Allemagne à la suite des réformes Hartz. Après 2005, l'Allemagne a créé 2,5 millions d'emplois qui étaient principalement des contrats à temps partiel ou temporaires. La part de l'emploi temporaire en Allemagne était d'environ 10-11% dans les années 1990, alors qu'elle s'élevait à environ 14% de 2005 jusqu'à 2015, où une légère tendance à la baisse est observée depuis.

Ce type de travailleurs fait généralement face à de salaires et des possibiltiés d'emploi réduites, et donc à un risque plus important de pauvreté. Il existe aujourd'hui une littérature croissante questionnant si la promotion de ce type de contrat aide réellement les individus à intégrer le marché du travail ou s'il s'agit plutôt d'un 'piège' à emplois instables (appelé 'dead-end' en anglais). Une méta-analyse récente de Filomena and Picchio [2022] a mis en évidence qu'au cours des dernières années principalement, et lorsque le taux de chômage est élevé, l'hypothèse de l'impasse est plus susceptible de prévaloir que celle d'un tremplin. Cela signifie que les tra-

vailleurs sous contrat temporaire ont tendance à être piégés dans ce type de contrat. La plupart des études démontrent empiriquement que les travailleurs temporaires perçoivent des salaires inférieurs aux emplois permanents, après avoir contrôlé pour les caractéristiques de l'emploi (voir Booth et al. [2002], Blanchard and Landier [2002], Gebel [2010], OECD [2015], Kahn [2016]). Cependant, il n'y a pas de consensus clair sur cette question, car certains travaux sont allés dans le sens d'une "prime salariale" plutôt que d'une "pénalité salariale" pour les travailleurs temporaires [Lass and Wooden, 2019, Albanese and Gallo, 2020]. Concernant les effets sur la pauvreté en tant que tels, cela reste encore relativement peu traité dans la littérature économique. Des travaux récents ont montré que le fait d'être en contrat temporaire est fortement associé à de la pauvreté, au sein des pays européens [Horemans, 2017, Van Lancker, 2013]. Ces travaux montrent que la composition du ménage joue un rôle clé pour éviter la pauvreté. Ces études sont réalisées à partir de données en coupe transversales, ignorant ainsi les facteurs de biais tels que l'endogénéité. Je traite ces limites en prenant explicitement en compte la dépendance de la pauvreté dans notre analyse.

Ce travail vise à mieux comprendre la relation entre l'emploi temporaire et la dynamique de la pauvreté. J'évalue dans quelle mesure les travailleurs sous contrat temporaire sont confrontés à un risque de pauvreté plus élevé que les travailleurs ordinaires et comment des facteurs tels que la composition du ménage influencent ce risque.

En faisant usage des données du Panel Socio-Economique Allemand (SOEP), j'estime un modèle probit corrélé avec effets aléatoires, et avec conditions initiales endogènes [Wooldridge, 2005]. Cela me permet de prendre en compte comment la pauvreté présente induit de la pauvreté future, et de contrôler pour les sources d'endogénéité. J'étudie également les différences dans la dynamique de la pauvreté des contrats temporaires en fonction du genre et du statut marital. Ce chapitre apporte des résultats sur comment statut marital façonne la dynamique de la pauvreté des travailleurs temporaires, ce qui n'a pas été étudié dans la littérature. Les résultats suggèrent que les travailleurs temporaires sont confrontés à un risque de pauvreté plus élevé que les travailleurs permanents. Je montre que le risque d'entrer et de rester dans la pauvreté est particulièrement élevé pour les travailleurs intérimaires et les travailleurs sous contrat à durée déterminée de moins d'un an. Mes résultats démontrent que selon la situation du ménage, le fait de bénéficier d'un contrat temporaire a un impact différent sur le risque de pauvreté. Les personnes seules, en

particulier les femmes, sont confrontées à un risque de pauvreté considérablement plus élevé lorsqu'elles sont en contrat temporaire. En revanche, ce type de contrat ne semble pas avoir d'impact sur la dynamique de la pauvreté des personnes en couple.

Chapitre 2

Ce chapitre évalue les effets potentiels d'un système d'assurance chômage commun à l'Union économique et monétaire (EMU-UI) dans l'objectif d'améliorer la protection des revenus des travailleurs atypiques. Le projet d'un système d'assurance chômage commun pour la zone euro a été largement discuté après la crise de la dette souveraine. La crise actuelle du COVID-19 et le plan SURE (Temporary Support to mitigate Unemployment Risks in an Emergency) qui en découle ont relancé ce débat.

Nous nous concentrons ici sur les implications de ce projet en matière de protection sociale. Les travailleurs atypiques, notamment les emplois sous contrat temporaire, le travail à temps partiel et le travail indépendant, ont gagné de l'importance ces dernières années dans les pays de l'UE. La part des travailleurs permanents à temps-plein a diminué de 4 points de pourcentage au cours des 10 dernières années, selon le rapport sur le Développement Economique et Social (European Commission, 2018). Le Socle Européen des Droits Sociaux qui vise à soutenir et à promouvoir des marchés du travail et des systèmes de protection sociale équitables, déclare, au titre du principe 12, que "regardless of the type and duration of their employment relationship, workers, and, under comparable conditions, the self-employed, have the right to fair and equal treatment regarding working conditions, access to social protection and training.". Cela vise à encourager les pays de l'UE à développer des systèmes de protection sociale plus accessibles aux travailleurs atypiques.

Cependant, les travailleurs atypiques se caractérisent par un accès plus limité aux prestations d'assurance chômage et sont plus exposés au risque de pauvreté [Jara Tamayo and Tumino, 2021]. Les systèmes d'assurance chômage existants diffèrent considérablement d'un pays européen à l'autre en termes d'accessibilité et de générosité [Esser et al., 2013]. Le récent débat concernant la valeur ajoutée d'une assurance chômage commune pourrait être mis en perspective avec les exigences du Socle Européen des Droits Sociaux. En faisant usage du modèle européen de microsimulation EUROMOD, basé sur des données microéconomiques représentatives des 19 pays de la zone euro, nous étudions un scénario contrefactuel d'assurance

chômage pour l'année 2018. Nous simulons des transitions individuelles d'une situation d'emploi à une situation de chômage. Nous présentons des résultats sur le taux de couverture, le taux net de remplacement, et le risque de pauvreté, pour les systèmes nationaux actuels et dans le cadre d'un système assurance chômage commun.

Nos résultats indiquent une grande hétérogénéité entre les pays de la zone euro en termes de part des travailleurs atypiques. Notre travail met également en évidence l'hétérogénéité actuelle entre les pays de la zone euro concernant l'accessibilité à l'assurance chômage et la part du revenu préservée en cas de chômage. Le taux de couverture des systèmes nationaux d'assurance chômage tend à être plus faible en moyenne pour les travailleurs atypiques, puisqu'elle est inférieure à 60% dans sept pays pour les travailleurs à temps partiel et les travailleurs sous contrat temporaire. Les taux de remplacement des systèmes nationaux sont en moyenne assez similaires entre les pays pour l'ensemble de la population active. Ils présentent cependant des variations plus importantes pour les travailleurs sous contrat temporaire. Nous constatons que l'introduction d'une assurance chômage commune augmenterait les taux de couverture et de remplacement des systèmes d'assurance chômage dans tous les pays. Mais cela dans une moindre mesure pour des pays comme la France, la Belgique ou l'Autriche, caractérisés par des systèmes d'assurance chômage relativement généreux. L'assurance chômage européenne comblerait l'écart actuel entre les pays de telle sorte qu'elle conduirait à des taux de couverture supérieure à 70% dans tous les pays et augmenterait les taux de remplacement nets dans les pays initialement moins généreux. Ce régime protégerait également une partie importante des travailleurs contre le risque de tomber dans la pauvreté en cas de perte d'emploi, notamment en Italie, en Estonie et en Irlande.

De plus, permettre aux travailleurs indépendants d'accéder à un système d'assurance chômage augmenterait fortement leur taux de remplacement, notamment en Grèce, en Espagne et en Lituanie. Cela réduirait fortement la pauvreté de ces travailleurs. Notre analyse nous permet d'évaluer l'effet d'un système d'assurance chômage supranational pour la zone euro, généralement présenté comme un outil de stabilisation potentiel. Comme ce système semble augmenter la protection et le maintien des revenus, nous pouvons nous attendre à ce que celui-ci soit un outil performant de stabilisation.

Chapitre 3

Ce chapitre étudie également les effets potentiels d'une assurance chômage européenne pour les pays de la zone euro en intégrant les effets comportementaux en termes d'offre de travail. Alors qu'il existe une littérature importante sur les implications budgétaires et stabilisatrice d'un tel projet, l'impact concernant les incitations individuelles à travailler n'a jamais été étudié.

De manière générale, il n'existe que peu de travaux se concentrant sur les effets sur l'offre de travail des prestations hors emploi, telles que l'assurance chômage basé sur un modèle structurel. Nous abordons cette question en simulant l'introduction d'une assurance chômage européenne selon deux principales conceptions. Nous simulons une assurance chômage commune qui remplacerait partiellement les systèmes nationaux car elle peut être complétée par les systèmes d'assurance chômage nationaux lorsqu'ils sont plus généreux. Ensuite, nous étudions également un scénario d'assurance chômage caractérisée par une substitution complète des systèmes nationaux d'assurance chômage vers un système commun. À l'aide du modèle européen de microsimulation EUROMOD et de données microéconomiques représentatives des 19 pays de la zone euro, nous simulons différents scénarios contrefactuels pour l'année 2018. Nous estimons un modèle d'offre de travail à choix discret et comparons les élasticités de l'offre de travail aux salaires et aux revenus hors travail pour tous les pays. Nous nous concentrons sur les changements en termes d'heures travaillées induits par nos réformes. Ainsi, les effets sur les marges intensives et extensives sont étudiés. Nous estimons un modèle structurel d'offre de travail à l'aide d'un modèle logit mixte pour tenir compte de l'hétérogénéité non observée, en intégrant des variations aléatoire des préférences des individus. Les préférences varient ainsi entre les ménages en fonction de variables socio-économiques telles que l'âge, la présence d'enfants et la présence de personnes âgées.

À notre connaissance, aucune étude ne s'est penchée sur les conséquences de l'introduction d'un système d'assurance chômage commun sur l'offre de travail des individus. Pourtant, en modifiant à la fois la générosité et la durée des prestations d'assurance chômage, un tel système est susceptible d'affecter les décisions d'offre de travail.

Nous montrons que les implications sur l'offre de travail diffèrent grandement selon les conceptions de ce système d'assurance chômage. Nous constatons qu'un système forfaitaire qui tend davantage vers un modèle Beveridgien impliquerait une très forte désincitation au travail, bien que cela serait couplé à une réduction de la

pauvreté conséquente. Un système d'assurance chômage basique, entièrement basé sur des cotisations, permettrait de limiter beaucoup plus les distorsions sur le marché du travail dans la plupart des pays mais aurait des effets limités en termes de pauvreté et d'inégalités. Un système avec un taux de remplacement commun, articulé avec des montants planchers et plafonds, permettrait une convergence vers le haut car elle réduirait fortement la pauvreté et les inégalités dans plusieurs pays, notamment dans les pays où les taux de pauvreté ont tendance à être élevés, sans pour autant induire une trop forte réduction de l'offre de travail.

Lignes directives méthodologiques

La méthodologie du chapitre 1 est basée sur l'analyse des données de panel et plus particulièrement sur le panel socio-économique allemand (SOEP). Cet ensemble de données est une enquête longitudinale portant sur environ 11 000 ménages privés de la République fédérale d'Allemagne de 1984 à 2020 (publié en 2022) et des "länders" de la partie Est de l'Allemagne de 1990 à 2020. Le premier échantillon, celui de 1984, comptait près de 6 000 ménages basé sur un échantillonnage aléatoire. Un échantillon d'environ 2 200 ménages de la partie Est de l'Allemagne a été ajouté en juin 1990, six mois après la chute du mur de Berlin. Il rassemble des informations sur la composition des ménages, l'emploi, la profession, les revenus, la santé et les indicateurs de satisfaction. Dans le chapitre 1, nous sélectionnons les individus en âge de travailler, de 19 à 64 ans, qui ont travaillé au moins deux ans pendant la période observée. En outre, nous sélectionnons un échantillon d'individus qui sont le principal soutien économique du ménage. Nous disposons ainsi d'environ 160 207 observations. Nous observons environ 5000 individus par année, que nous suivons pendant 10 ans en moyenne. Parmi ces observations, 143 126 observations sont sous contrat permanent et 17 081 observations sont des individus sous contrat temporaire. L'utilisation de données longitudinales est essentielle lorsqu'on étudie un sujet tel que la pauvreté, car il s'agit d'un phénomène dynamique. Le statut de pauvreté et la situation professionnelle passés peuvent avoir une incidence sur la pauvreté actuelle. Il est donc crucial de suivre les individus dans le temps. Comme le souligne Ryder [1985], *'A person's past affects his present, and his present affects his future.'*.

D'un point de vue statistique, les données longitudinales de panel fournissent également une base plus solide dans le cas d'inférences causales, car elles englobent

des variations au niveau individuel, ce qui me permet de contrôler l'hétérogénéité non observée. Le champ d'application du chapitre 1 est la pauvreté au niveau des ménages. Nous avons donc basé notre mesure de la pauvreté sur l'indicateur de *Taux de risque de pauvreté* (AROP) basé sur la définition d'Eurostat. Cet indicateur étant très répandu dans les études menées par la Commission Européenne et dans la littérature académique. Le taux de personnes à risque de pauvreté représente la proportion de personnes dont le revenu disponible équivalent (après transferts sociaux) est inférieur au seuil de risque de pauvreté, fixé à 60% du revenu disponible équivalent médian au niveau national. Un individu est considéré comme pauvre si son revenu équivalent est inférieur à cette valeur. Le revenu disponible équivalent est le revenu total disponible (revenu après impôts et transferts) divisé par le nombre d'individus dans le ménage, converti en utilisant une échelle d'équivalence. Dans notre cas, nous utilisons l'"échelle d'équivalence modifiée de l'OCDE"[21]

Comme les chapitres 2 et 3 consistent en une évaluation ex-ante des réformes des allocations chômage, j'ai implémenté des scénarios contrefactuels basés sur des techniques de microsimulation. Nous présentons ici plus en détail ces techniques.

Les modèles de microsimulation

'The core purpose of microsimulation models is to understand and manage complexity', comme mentionné par O'Donoghue and Dekkers [2018]. Cette complexité est due à la structure de la population, à la structure des politiques et à la complexité des réponses comportementales à ces politiques.

Les modèles de microsimulation correspondent à différentes techniques de modélisation permettant de simuler les effets d'une politique sur les agents économiques au niveau individuel. Il permet donc d'évaluer l'impact des politiques gouvernementales sur les individus ou les ménages. Etant donné que cette thèse est réalisée au niveau microéconomique, elle permet d'identifier les résultats sur des sous-groupes particuliers mais aussi de calculer des indicateurs de résultats macroéconomiques. Une simulation de politique consiste à évaluer l'impact d'un changement de l'environnement économique, impliqué par une réforme de politiques ou prestation publique, sur un ensemble d'indicateurs d'activité et de bien-être. L'évaluation des réformes politiques

[21]Le carré d'équivalence modifié de l'OCDE attribue une valeur de 1 pour le chef de ménage, 0,5 pour chaque membre du ménage âgé de plus de 14 ans et 0,3 pour chaque enfant. Voir Hagenaars et al. [1994] pour plus de détails.

peut se faire *ex-post* ou *ex-ante*, cette dernière étant l'objectif de la microsimulation. Guy Orcutt, considéré comme le fondateur des techniques de microsimulation, expose que *"Current models of our socio-economic system only predict aggregates and fail to predict distributions of individuals, households, or firms in single or multi-variate classifications."* [Orcutt, 1957].

L'utilisation de techniques de microsimulation dans l'évaluation des politiques a l'avantage de prendre en compte l'hétérogénéité des agents économiques plutôt que de travailler avec des "individus représentatifs". Travailler avec des milliers d'individus hétérogènes permet de mieux appréhender les implications des réformes politiques et d'effectuer une analyse distributive. Cela permet d'identifier les individus qui pourraient être les "perdants" et les "gagnants" de certaines réformes [Bourguignon and Spadaro, 2006]. Un autre avantage de l'utilisation des techniques de microsimulation est que les règles fiscales, et les règles déterminant qui est éligible à certaines prestations, sont généralement non linéaires et présentent parfois des sauts discontinus. Les modèles de microsimulation s'adaptent relativement facilement à de telles formes fonctionnelles [Klevmarken, 2001].

Les modèles de microsimulation ne prenant pas en compte les effets comportementaux des agents, généralement caractérisée comme *modèles arithmétiques*, applique une modification dans la contrainte budgétaire des individus induite par une réforme. Cette modélisation permet d'étudier l'implication distributive d'une certaine politique. Dans le chapitre 2, nous appliquons cette analyse, en travaillant avec une série d'indicateurs pour évaluer les effets de plusieurs réformes. En allant un peu plus loin dans l'analyse, la microsimulation *comportementale* tient compte des réponses comportementales des individus, suite à un changement de leur contrainte budgétaire, en termes d'offre de travail ou d'épargne par exemple. Cela peut se faire par l'estimation de modèles économétriques *structurels*. Les modèles structurels identifient les paramètres structurels sous-jacents qui régissent le comportement des individus. Ils permettent de faire des prédictions sur la façon dont un environnement changeant, tel qu'un changement de politique, affecte le comportement des individus. Au chapitre 3, nous développons un modèle structurel d'offre de travail pour les pays de la zone euro, afin d'intégrer les réponses comportementales des individus aux réformes d'assurance chômage.

Dans ma thèse, j'utilise le modèle de microsimulation EUROMOD[22], un modèle multi-pays pour les pays européens, basé sur des micro-données représentatives des

[22]Pour plus d'informations, voir Sutherland and Figari [2013]

ménages, les statistiques européennes sur le revenu et les conditions de vie (EU-SILC). Il s'agit d'une enquête annuelle fournissant des micro-données sur une série d'indicateurs sociaux tels que le revenu, la pauvreté, l'exclusion sociale et les conditions de vie. Plus précisément, nous utilisons les données EUROMOD, dérivé d'EU-SILC. Nous utilisons la base de données EUROMOD pour 2016. Le modèle EUROMOD mobilise des informations détaillées sur la composition du ménage, les caractéristiques des membres du ménage et leurs revenus provenant de la base EU-SILC afin d'apporter des définitions communes des concepts de revenu, permettant ainsi un calcul détaillé et harmonisé des prestation et prélèvements sociaux au niveau microéconomique. Dans les chapitres 2 et 3, nous restreignons notre échantillon aux individus âgés de 16 à 64 ans qui ne sont ni étudiants, ni en incapacité de travailler, ni retraités. EUROMOD permet d'effectuer des comparaisons entre pays des systèmes fiscaux et de prestations entre les pays ainsi que d'analyser l'impact de réformes communes à plusieurs pays Figari et al. [2007]. Nous effectuons ces deux analyses dans les chapitres 2 et 3. En modifiant à la fois la générosité et la durée des prestations d'assurance chômage, un système d'UEM-UI est susceptible d'affecter les décisions relatives à l'offre de travail. Il a été démontré qu'un changement du niveau des allocations chômage peut affecter la durée des périodes de chômage, via une modification des salaires de réserve ou de l'effort de recherche d'emploi (voir Krueger et Mueller, 2010 pour une étude). Lefebvre et Simon (2021) ont donné un aperçu des résultats du projet en termes de redistribution et de modification du nombre d'heures de travail souhaitées sans tenir compte du côté de la demande du marché du travail, ce qui pourrait conduire à des estimations biaisées des résultats potentiels du marché du travail. Ce projet de recherche vise à étudier les implications d'une UEM-UI sur le marché du travail européen en tenant compte de la demande de travail en modélisant un équilibre partiel du marché du travail basé sur Colombino (2013) et Colombino et al. (2021). Nous fournissons une application de la modélisation récente des évaluations de réformes basées sur la statique comparative qui prend en compte des facteurs tels que l'accessibilité de différents types d'emplois en modélisant la demande de travail. Nous estimons un modèle d'offre de travail à choix discret (Aaberge et al., 1995 ; Van Soest, 1995) basé sur l'approche de la maximisation de l'utilité aléatoire (McFadden, 1974). Basé sur Colombino et al. (2013), ce modèle d'offre de travail est excentré en prenant en compte les différences entre les secteurs professionnels et les statuts d'emploi.Ce modèle permet les transitions du statut de chômage à celui d'inactivité et vice versa. En outre, le modèle inclut

l'équilibre du marché du travail en reliant la densité des types d'emploi au nombre d'emplois disponibles.L'équilibre est atteint en ajustant les salaires. Pour analyser l'implication d'un système européen d'allocations chômage sur l'équilibre du marché du travail, je me base sur le modèle de microsimulation des impôts et des allocations EUROMOD, étendu avec un modèle comportemental tenant compte de la demande de travail, avec des microdonnées d'enquête sous-jacentes, les données EU-SILC. Le scénario de réforme, c'est-à-dire l'introduction d'une UEM-UI commune qui serait mise en œuvre par une fonction fiscale estimée, impliquerait un nouvel équilibre du marché du travail. En outre, ce modèle nous permettrait de considérer un choc sectoriel et de comparer l'implication d'un choc sectoriel sur le marché du travail avec et sans UEM-UI.

Chapter 1

Temporary employment and poverty dynamics in Germany

Summary of the chapter

This paper studies the implication of temporary contracts on poverty dynamics. Specifically, we examine the poverty risk associated with temporary agency and fixed-term contract workers. Using the German Social-Economic Panel (SOEP), we estimate a correlated random effect probit model with endogenous initial conditions, controlling for the initial value of explanatory variables, to assess the true state-dependence of poverty. Our results suggest that temporary workers face a higher risk of poverty than permanent workers. We provide insights on the risk of entering but remaining in poverty and show that this risk is significantly high for temporary agency and fixed-term contracts of less than one year. We show a reduced risk of poverty when it comes to medium-term contracts, whereas it increases again for more extended fixed-term contracts. Furthermore, we show that depending on the family situation, being on a temporary contract has a different impact on the risk of poverty. Single individuals face a considerably higher risk of poverty when they are on a temporary contract, whereas this does not appear to impact the poverty dynamics of in-couple individuals.

1.1 Introduction

Temporary employment has been a growing trend since the 1990s and after the Great Recession in most European countries, especially Germany. In the European Union (EU), the share of temporary employment over total employment went from 13.5% in early 2000 to 15% in 2019. These contracts have been introduced to provide more flexibility to employers to tackle unemployment, particularly by enabling the integration of workers marginalised from the labour market. Countries have been incentivised to flexibilize labour markets to fight unemployment, notably after the recent crises. The job instability faced by this type of contract has led to recent concerns regarding the economic consequences on workers. In 2018, 9.5% of employed persons in the EU were at risk of poverty, which is three times greater for temporary contract workers (16.2%) than workers in permanent contracts (6.1%).

This paper aims to provide further insights into the role of temporary contracts in shaping poverty. We study the link between temporary contracts and poverty in a dynamic framework for the case of Germany. Using the Socio-Economic Panel Survey (SOEP) data, we estimate a correlated dynamic random effects probit model with endogenous initial conditions [Wooldridge, 2005], allowing us to take into account the state-dependency of poverty and controlling for sources of endogeneity. More specifically, we consider separately temporary agency contracts and fixed-term contracts of different duration. We also investigate differences in poverty dynamics of temporary contracts by gender and marital status[1]. We contribute to the literature by providing new insights into the effect of temporary contracts as we control for sources of endogeneity and state dependency. Most studies are done ignoring these factors, except for Amuedo-Dorantes and Serrano-Padial [2010] for Spain. We also provide evidence on how marital status shapes the poverty dynamics of temporary workers, which has not been studied.

Germany represents an interesting case because it has particularly experienced a period of deregulation and flexibilisation of the labour market in recent decades, marked by the Hartz[2] reforms. Following these reforms, the share of temporary workers increased. However, this labour market flexibilisation in Germany seems to have contributed to the so-called "German miracle"[3], there are concerns about the

[1]We consider the marital status here as being in-couple or not, regardless of being married or not. This relies more on a relationship status.

[2]See Section 1.3 detailing the content of this reform in favour of the expansion of temporary contracts.

[3]The term 'German miracle' refers to Germany's economic performance during the Great

consequences of this type of employment not only on the career prospects of these workers but on the poverty that may result from it.

There is growing literature on whether promoting this type of contract helps individuals integrate the labour market sustainably or whether it is more of a trap door to unstable jobs. This so-called debate on 'stepping-stone' vs dead-end'[4] hypothesis does not provide a clear answer for now. A recent meta-analysis from Filomena and Picchio [2022] highlighted that the dead-end hypothesis is most likely to prevail in more recent years and when the unemployment rate is high. They concluded that temporary contracts, especially casual employment, should not be encouraged in' bad times, as individuals have a high chance of being 'trapped' in these contracts. They also show that it is mainly the case regarding temporary agency workers. Following these results, as temporary workers tend to be 'locked' in these contracts type, temporary contracts might affect the present and future poverty, which is our concern in this paper.

In addition to the insecurity due to lower labour market attachment, temporary workers tend to face also a 'wage penalty. Most empirical studies found that temporary workers receive lower wages after controlling for job characteristics (see Booth et al. [2002], Blanchard and Landier [2002], Gebel [2010], OECD [2015], Kahn [2016] among others). This 'wage penalty' might be due to lower bargaining power and access to training. However, there is no clear consensus on this issue, as recent works provided evidence of a 'wage premium' for temporary workers. Albanese and Gallo [2020] found a positive wage gap in favour of temporary contract workers in Italy. Lass and Wooden [2019] also provided evidence of a 'wage premium' for casual and temporary agency workers and no difference in wages between fixed-term and permanent workers.[5] As regards Germany, our case study, Jahn [2010] showed that temporary agency workers suffer from a 20% negative wage gap in comparison to permanent workers.

Even if temporary workers face a wage penalty, this does not automatically translate into lower disposable incomes, thus higher poverty risks, whether long-lasting or

Recession of 2008-09, during which the unemployment rate in Germany hardly increased at all, unlike in other European countries. It would seem that this performance was partly due to the Hartz I reform, which increased temporary contracts. This reform would have helped to maintain employment, partly indirectly via a downward pressure to wage generated by these types of contracts [Boysen-Hogrefe and Groll, 2010].

[4]The stepping-stone vs dead-end corresponds to the current debate in the economic literature on whether temporary jobs provide a springboard to permanent contracts (stepping-stone effect) or if the worker stay trapped in temporary contracts (dead-end effect)

[5]We discuss more details these results in Section 1.2

not. This relationship is not as axiomatic as one might think, as the family composition and other sources of income lead to different financial situations [Andress and Lohmann, 2008]. In principle, temporary workers would have more access to unemployment, in-work or family benefits. This plays a role in defining income poverty at the household level. All these factors need to be studied to understand the interplay between temporary contracts and poverty at the household level.

As for poverty and temporary contracts, recent works showed that temporary contracts are associated with higher poverty risks [Horemans, 2017, Van Lancker, 2013]. Other studies rely more generally on in-work poverty, such as Marx and Nolan [2014], Lohmann [2009], Lohmann and Crettaz [2018], Andress and Lohmann [2008], also provided shreds of evidence of more considerable risks of poverty for temporary workers. These works show that household composition plays a role in explaining poverty risk. These studies are conducted in a static framework, thus ignoring biasing factors such as endogeneity. One of the sources is the reverse causality here, as being under a temporary contract may affect the risk of poverty. The other way is also possible. Another source of endogeneity could be due to the state dependency of poverty. We will tackle these limitations in our analysis by explicitly taking into account state-dependency of poverty in our empirical strategy.

This work thus relies more generally on the topic of poverty dynamics. Poverty is a dynamic process, as individuals who experience poverty are more likely to face poverty in the future [Cappellari and Jenkins, 2004, Biewen, 2009, Jenkins, 2011, Ayllón, 2013]. Two sources of state-dependence of poverty can be identified: the 'true' or 'genuine' state-dependency and the 'spurious' state-dependence. The 'spurious' state-dependency could be due to characteristics that make individuals more vulnerable to the risk of poverty, such as health, human capital, living arrangements, and other various sources; this can be captured by unobserved and observed heterogeneity. The 'true' state dependency of poverty, relies on the fact that experiencing poverty causes future poverty. Assessing the extend to which poverty is due to 'true' state-dependency is of interest to better understand poverty. Understanding how individuals become poor but tend to stay poor is essential to designing policies to eradicate poverty. In this work, we measure the state-dependency of poverty faced by different subgroups of individuals.

While poverty dynamics itself has been much studied, the literature on poverty and temporary contracts controlling for state-dependency of poverty remains scarce. To our knowledge, the only work doing this is done by Amuedo-Dorantes and Serrano-

Padial [2010] for Spain[6]. They highlighted a high risk of poverty for short-term contracts specifically.

We distinguish this work by separating contracts not only by duration but also study separately the specific case of temporary agency workers, which is specifically of interest to Germany. We also apply a different empirical strategy as we implement Wooldridge's solution to the initial condition problem [Wooldridge, 2005], allowing us to measure how being poor initially shapes future poverty. We also augmented the model by the initial period of explanatory variables, leading to a more flexible model for the unobserved heterogeneity [Rabe-Hesketh and Skrondal, 2013]. Another important intake of our analysis is that we study how the type of contract affects differently various household compositions. While other papers have already conducted an analysis looking at the effects by gender, we are, to our knowledge, the only paper analysing the poverty dynamics by both gender and relationship status. Anticipating our results, we show that this plays an essential role in the poverty implications of contract types.

The rest of the paper is organised as follows. Section 1.2 presents literature related to this study. Section 1.3 presents the institutional framework for the development of temporary work in Germany. The results of our analysis are presented in Section 1.5. Conclusions are drawn in Section 1.6.

1.2 Literature review

As mentioned earlier, there are multiple channels through which temporary contract workers are more likely to face poverty. First, due to their lower labour market attachment, temporary workers spend less time in employment, which affects the poverty risk in a fairly obvious way. Another channel could be that temporary workers tend to have lower wages than permanent ones.

Regarding wages, theoretical literature suggests that temporary jobs would benefit from wage compensation for the lack of employment security [Rosen, 1986]. This positive effect of temporary contracts on wages has also been found empirically by Albanese and Gallo [2020] for Italy and Lass and Wooden [2019] for Australia. Albanese and Gallo [2020] focused on the wage gap at the hiring time of workers and reported a 'wage premium' in favour of temporary workers. They suggested that differences in anticipated wages could explain this. Wages of permanent workers are

[6]We discuss more in detail this work in Section 1.2

expected to grow, while temporary workers have less room to increase, so they can afford higher wages as they stay for a short period. Lass and Wooden [2019] also found a positive wage gap for casual and temporary agency workers and no difference in wages between fixed-term and permanent workers. They explained these results, which are opposite to European studies, by the functioning of Australian labour markets with casual work instead of fixed-term contracts being the primary way to respond to fluctuations in demand. However, most of the literature tends towards the conclusion of a wage penalty (see Blanchard and Landier [2002], Booth et al. [2002], Gebel [2010], OECD [2015], Kahn [2016], Regoli et al. [2019] among others). These results are explained partly by lower bargaining power [Bosio, 2014] and less access to training [Booth et al., 2002]. The work of OECD [2015] showed that the wage penalty increases with age and skills in many countries. They show that the wage penalty is one of the leading causes of increased poverty risk for temporary contracts. Some work found that the wage gap tends to be higher for low-wage workers in some countries, including Germany [Regoli et al., 2019, Mertens et al., 2007].

As for the effects on income, Lass and Wooden [2019] is the only study that finds a positive effect of temporary contracts on income. Results showed that fixed-term contract workers have higher disposable income than permanent contract workers. However, they found that casual and temporary agency employees are associated with lower household income. Apart from this study, most literature shows that being under a temporary contract negatively affects income. Temporary employment is associated with a higher probability of experiencing financial difficulties Buchler et al. [2009], Jenkins [2011] and lower levels of financial satisfaction.

More specifically, the scope of literature on the poverty risk of temporary workers remains relatively scarce. Based on cross-sectional EU data, the work of Horemans [2018] studied the effect on poverty of both part-time and temporary contracts. They applied an Oaxaca-Blinder decomposition, allowing them to explain the poverty gaps between temporary and permanent workers according to socio-demographic characteristics, household compositions, and hourly wages. They provided evidence of a higher poverty risk for temporary workers than for permanent ones. Also, they suggest that the poverty risk can only be understood by considering other household members and government transfers, as these play a crucial role. We will also study these factors in our analysis. Also, based on cross-sectional EU data, Van Lancker [2013] highlights that temporary contracts face higher poverty risks. They showed that the main cause of this increased risk of poverty is a difference in wages. They

also dig for a gender perspective and found that women under temporary contracts have lower poverty risk than men. They explained this last result by women being more secondary earners in the household. We circumvent this limitation in the paper by focusing on the primary earner in the household. These works are conducted in a static framework, providing insight into poverty at one point in time. We deepen these works by analysing how contracts affect poverty in a longitudinal framework. Regarding the literature on poverty risk from a dynamic perspective, Debels [2008] studied the poverty related to different types of contracts in EU countries. Using pooled cross-sectional data, we study poverty conditional on current labour market status and household context and controlling for age and education level. Results indicated that going from a temporary to a permanent contract has very little or no effect in many EU countries, except for Southern European countries, for which switching from temporary to permanent decreases the poverty risk. As it is based on fixed-effect logit estimation, this work considered time-varying unobserved heterogeneity. However, it did not control for time-invariant characteristics affecting potentially the poverty risk, such as health, gender etc. Therefore, they did not study the state-dependency of poverty, meaning that the contract type is considered exogenous in this case. It seems important to consider that contract type is potentially endogenous, as past poverty status might affect the probability of being under temporary contracts. Indeed, individuals might have a greater propensity to accept any type of contract, already constrained by their poverty situation.
citeamuedo2010labor is the only work tackling this endogeneity issue. Using longitudinal data for Spain, they estimated a probit panel data model based on the conditional maximum likelihood approach for limited dependent variables. In their paper, they estimated the risk of poverty according to whether being on a permanent or temporary contract and the previous work status. They also considered the previous poverty status to address poverty's state-dependency. They showed that very short-term contracts are associated with an increased poverty risk, particularly for women and older men. This risk of poverty seemed to be driven mainly by very short-term contracts. They explained the difference in poverty exposure between women and men because women might use temporary contracts as a secondary earner in the household. Here again, we rule out this effect in our analysis by focusing on the primary earner. It is worth noting that they did not consider separately the case of temporary agency workers and did not study how marital status plays a role, which we provide in our analysis.

Three considerations can be raised about the literature on temporary contracts and poverty. First, except for [Amuedo-Dorantes and Serrano-Padial, 2010] for Spain, all studies on temporary workers and poverty do not study the dynamics of poverty, ignoring the state-dependency of poverty. Second, most works found a lower poverty risk for women, driven by the fact that they tend to be secondary earners in the household. Third, no studies assess how the poverty risk of temporary contracts might differ by marital status and gender.

Our work brings new insights into the literature on poverty dynamics and temporary contracts by considering all these factors.

1.3 Institutional framework

In Germany, temporary contracts represented 12% of total employees in 2019. Between 2000-2010, the share of temporary contract workers considerably increased. This was primarily initiated by the major labour market reforms implemented in Germany. After 2005, Germany created 2.5 million jobs that were mainly part-time or temporary contracts. The Hartz I reform, which went into effect in January 2004, allows for extensive use of temporary contract employment in Germany. The Hartz I reform eliminated the maximum duration of a temporary contract assignment (24 months before that). It allowed an exception to the obligation of equal treatment and equal pay between temporary and permanent employees. Among temporary workers, the share of temporary agency workers increased in previous years in Germany, particularly during the financial crisis, as it went from 2.1% in 2009 to 2.7% in 2010. In June 2010, 53% of new job creation was temporary employment contracts [Spermann, 2011]. Temporary agency workers represented around 3% of the total employees in 2016. By comparison, this proportion was 0.8% at the end of the 1990s.

Since 2017, Germany has put in place reforms[7] to improve conditions of temporary agency workers. These reforms aim to reduce temporary agency workers' hiring time to 18 months and ensure equal pay between temporary agency and permanent workers after nine months in the same company. In 2015, the average wage of temporary agency workers was 42% lower than employees.

Regarding employment protection of temporary workers more generally, the Employment Protection Legislation (EPL) is an indicator which evaluates the regu-

[7]For more details, see Hanesch [2017] and LABREF database, DG Employment, Inclusion and Social Affairs - European Commission

lations of both dismissal and hiring of workers developed by the OECD [8]. More precisely, an indicator of regulation of temporary contracts was developed, taking into account many indicators such as length of notice period for dismissal or amount of severance pay. In 2019, the strictness of employment protection of temporary contracts in Germany was 1.38. This score was at around 2-3 during the 1990s and suddenly dropped in 2005 to 1-1.13 and then increased again since 2017. This score is relatively low compared to other European countries. It is at 3.00 for France and around 1.60 in Finland and Denmark in 2019.

Figure 1.1 presents the prevalence of temporary workers by gender in Germany from 1990 to 2020 as a share of temporary contract workers over all employees. We observe that the share of temporary contracts increased sharply after the 2000s and decreased after 2010. This is in line with the impulses done by the Hartz reforms. The share of temporary workers seems to be in the same order of magnitude among men and women since 2005, while there was a distinct over-representation of women before that. In 2019, the share of temporary contracts among women was at 11,6% while it is at 12,2% for men.

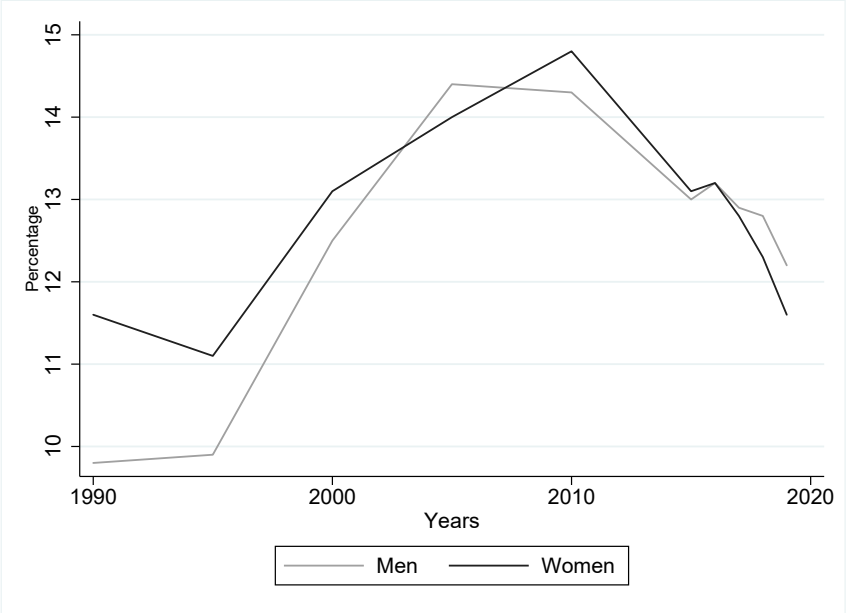


Figure 1.1: Share of temporary contract workers by gender in Germany, 2019
Source: OECD (2022), Temporary employment indicator

[8]for more details, see https://www.oecd.org/els/emp/oecdindicatorsofemploymentprotection.htm

1.4 Data and empirical strategy

1.4.1 Data and descriptive statistics

We base our empirical analysis on data from SOEP (Socio-Economic Panel Study) for Germany covering an extended period from 1984-2019. The German Socio-Economic Panel (SOEP) provides representative individual longitudinal data for all persons older than 16 years living in German households. The representative panel study started in 1984 and provided subjective as well as objective information about the individual living conditions in Germany [Goebel et al., 2019]. We select individuals of working age, from 19 years old to 64 years, who worked at least two years during the observed period. We select the main earner in the household. By this, we discard the use of temporary contracts as a complementary job within the couple[9]. Over the whole period, we have 160,207 observations, with 143,126 observations under a permanent contract and 17,081 observations of temporary contract individuals. We observe about 5000 individuals per year that we tracked for ten years on average.

Table 1.1 shows our data's distribution by contract types at three points in time. This enables us to study how temporary contracts evolved in Germany during the 2000s with the Hartz reforms and after the sovereign debt crisis. This table shows that Germany's share of permanent contracts seems to decrease. In this analysis, we separate all temporary contracts by a temporary agency contract, fixed-term < 1 year, fixed-term 1-2 years, and fixed-term with longer duration. We observe that the share of temporary contracts, particularly for short-term contracts (fixed-term < 1 year), has increased.

Table 1.1: Prevalence of contract types in percentage among total employment

Year	2000	2010	2019
Permanent	91.25	88.53	88.06
Temporary agency	1.52	2.22	2.73
Fixed-term < 1 year	3.23	4.11	4.4
Fixed-term 1-2 years	1.46	2.08	2.2
Fixed-term > 2 years	2.55	3.05	2.61

Source: SOEP data

Table 1.2 presents the characteristics of all temporary workers from our sample. First, we observe that the average age was at 34.92 years old in 2000, showing that

[9]Van Lancker [2012] for example, found that women under temporary contracts have a lower risk of poverty. One possible explanation is that women are likelier to be the secondary earner.

temporary workers tend to be relatively young. This age increased to 37.78 years old in 2019, showing that temporary contracts increasingly affect also older workers. The share of women and couples among this type of worker seems relatively stable, with a predominance of men among temporary workers and single individuals. This type of employment seemed to be combined with unemployment benefits receipt during 2000, as around 14% of workers benefited from unemployment benefits. This share was only at 6% in 2019. We find the same tendency for recipients of social assistance benefits. We observe that the increasing tendency of temporary contract workers is mainly driven by the increase of fixed-term contracts of less than one year and temporary agency work. The share of temporary contract workers in the population increased over the years while the share of temporary workers over two years tends to decrease. Overall, temporary contracts are increasingly prevalent and of shorter duration. The share of individuals at risk of poverty is also increasing, going up to around 37% in 2019. We discuss the poverty incidence in further details in Table 1.9 below.

Table 1.2: Characteristics of temporary workers

	2000	2010	2019
Men	55.93	49.58	56.60
Women	44.07	50.42	43.40
Average age	34.92	37.93	37.79
Couple	45.34	43.44	44.50
Having at least 1 children in %	48.98	60.61	44.74
Mean household's size	2.23	2.65	2.49
Upper education degree	32.27	34.55	28.75
Mean worktime per week	39.71	35.85	35.78
Unemployment benefits recipient	14.34	11.46	6.19
Social assistance recipient	4.73	2.51	0.73
Contract			
Temporary agency	13.77	15.50	19.68
Fixed-term ¡1 year	37.50	37.43	38.26
Fixed-term 1-2 years	17.80	18.99	18.83
Fixed-term ¿2 years	30.93	28.07	23.23
Share at risk of poverty	26.91	33.94	36.55

Table 1.3 presents the transition matrix from different types of contracts. We observe that the share of individuals under a permanent contract who stay at permanent contract is essential, as 96.4% of permanent contracts stay under this type

of contract. Individuals with a temporary agency contract tend to transition largely under fixed-term contracts with short duration (fixed-term less than one year), only 10% stay under temporary agency contracts. About 43-45% of fixed-term contract workers transition to a permanent contract and otherwise stay under a fixed-term contract. Thus, in our sample, there are movements from temporary to permanent contracts, which might affect the poverty risk of individuals.

Table 1.3: Contract type transition matrix in percentage

	Permanent	Temp. agency	FT<1 year	FT 1-2 year	FT>2 year
Permanent	96.4	0.9	1.59	0.28	0.83
Temp agency	41.27	10.17	45.22	1.64	1.71
FT < 1 year	43.4	6.67	13.89	31.68	4.42
FT 1-2 year	47.57	5.54	11.64	3.28	31.97
FT > 2 year	49.94	3.79	7.31	1.52	40.44

In this analysis, we use the equivalised disposable income at the household level to determine poverty. The equivalised disposable income is the total disposable income (income after tax and transfers) divided by the number of individuals in the household converted using the equivalence scale. In our case, we use the 'OECD modified equivalence scale'[10] Our poverty indicator is based on the At-risk-of-poverty rate (AROP). It identifies individuals living in a household with an equivalised disposable income lower than 60% of the median equivalised disposable income of the population.

Figure 1.2 presents the distribution of disposable income at the household level for the years 2000 and 2019. The grey line represents the income distribution of permanent contract workers, and the black line for temporary contract workers. The red line represents the current year's poverty line. We observe that the share of workers whose income is below the poverty line is higher for temporary contract workers than permanent workers. This tendency is more pronounced in 2019 than in 2000. The difference in the distribution of disposable income between temporary and permanent workers is more marked in 2019, with a distinctly lower and less dispersed level of disposable income for temporary workers. The detailed prevalence of poverty by contract types is presented in Table 1.9 in Appendix, showing a high poverty rate among temporary agency and fixed-term contracts of less than one year

[10]The OECD modified equivalence square assigns a value of 1 for the household head, 0.5 for each household member older than 14 years old and 0.3 for each child. See Hagenaars et al. [1994] for more details.

especially.

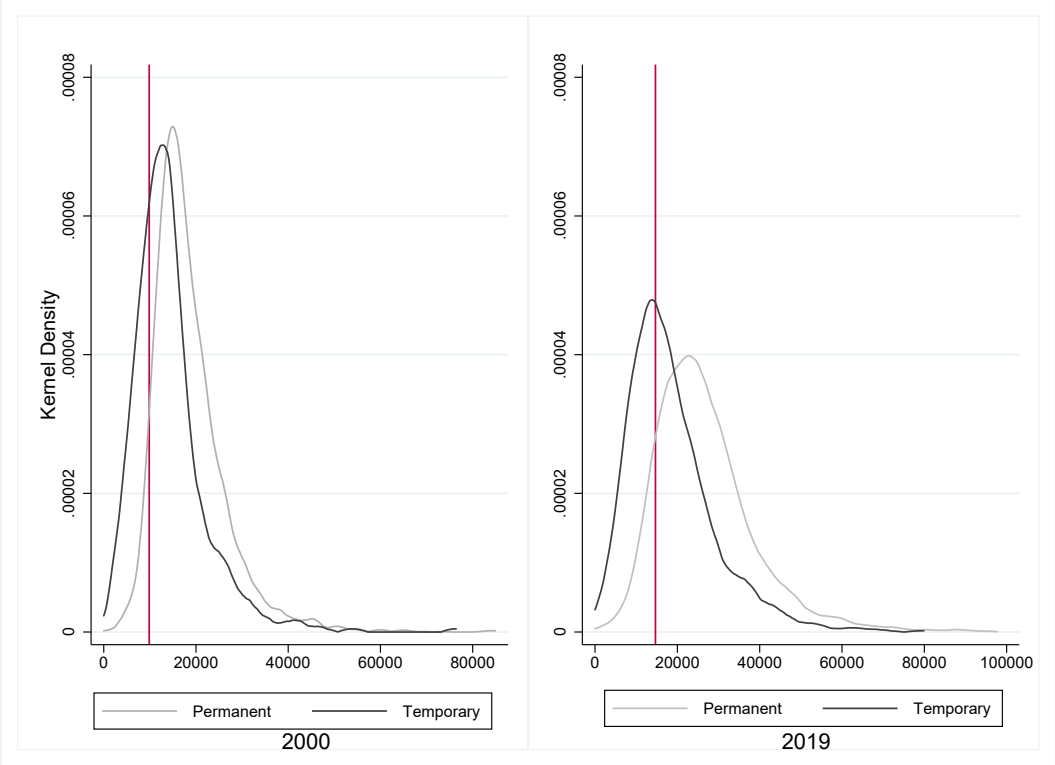


Figure 1.2: Equivalent income distribution 2000, 2019

Table 1.4 presents the transition matrix of being at risk of poverty among different types of contracts. We observe that individuals under a permanent contract and not poor have very low chances of falling into poverty (3.19%), while this risk increases for temporary contracts. The risk of poverty is significantly high for temporary agency contracts, as almost 30% of temporary agency workers who are not poor fall into poverty, while around 76% of poor individuals stay poor. The chances of transitioning from not poor to poor or staying poor decrease with the duration of temporary contracts.

Table 1.4: Poverty transition matrix

	Permanent		Temp agency		FT 1 year		FT 1-2 year		FT 2 year	
AROP	0	1	0	1	0	1	0	1	0	1
0	96.81	3.19	70.31	29.69	81.74	18.26	84.21	15.79	95.07	4.93
1	46.48	53.52	24.05	75.95	37.66	62.34	35	65	42.59	57.41

1.4.2 Empirical strategy

In order to study the poverty implication of temporary workers while identifying the state dependency on poverty, we need to disentangle how poverty affects future poverty from unobserved individual characteristics that might also affect poverty. The 'genuine' or 'true' dependence, the fact that experiencing poverty causes future poverty, is captured by the impact of the lagged poverty status. The 'spurious' state dependence, the individual characteristics determining poverty, is caused by the time-invariant unobserved heterogeneity. In order to take that into account, we estimate here a correlated random effect dynamic probit model with endogenous initial conditions, based on Wooldridge [2005]. This model allows us to control for unobserved heterogeneity and endogenous initial conditions to estimate an unbiased state-dependency of poverty.
The model specification can be written as:

$$y_{it} = \gamma Z_{it} + \rho y_{it-1} + c_i + u_{it} \tag{1.1}$$

The outcome variable y_{it} can be interpreted as the chances of experiencing a particular status, household-level poverty in our case, for unit i, at time t. y_{it} takes the value of one of the households i is the poverty status at time t and takes the value 0 if the household is not in a poverty situation. This is a function of a set of time-varying explanatory variables, Z_{it}. In our modelisation, Z_{it} includes the type of contract, our primary explanatory variable of interest here, education level, age, gender, relationship status, household size, working time per week, having a second job, unemployment and social assistance benefits, health and region. c_{it} is the individual heterogeneity, presented more in detail in Equation (1.2). u_i represents the idiosyncratic error term, normally distributed.

In this model, we control for unobserved heterogeneity by introducing a household-specific random effect that is assumed to be normally distributed and independent of other covariates. We relaxed the independence assumption following Mundlak's specification [Mundlak, 1978] with unobserved heterogeneity, which is decomposed with one correlated with time-varying explanatory variables and one uncorrelated. We treat the initial condition problem, meaning that ignoring initial conditions, in our case considering initial poverty status as exogenous, leads to bias and wrong inference of the magnitude of the 'true' state-dependency (see Heckman [1981] among others). We follow the approach based on Wooldridge [2005] 's "simple solution to

the initial condition problem". By conditioning the outcome variable by the initial observation (poverty status at the first period here), Wooldridge includes the values of the time-varying explanatory variables at each period in the model. We use Wooldridge's method using an alternative Conditional Maximum Likelihood estimator that considers the distribution conditional on the initial value of the poverty status here. We control for the poverty status in the first period observed. This allows us to estimate a correlated random effect probit model with endogenous initial conditions.

Although using within-unit averages has the benefit of parsimony and does not require a balanced panel, this model specification tends to provide biased estimates. The reason for this is that the conditional distribution of unobserved effects depends more on the value of the initial period than on the values of the other periods of the explanatory variables and basing the within-means on all available periods for incomplete panels has not been justified in the literature [Rabe-Hesketh and Skrondal, 2013, Skrondal and Rabe-Hesketh, 2014]. We use the solution proposed by Rabe-Hesketh and Skrondal [2013] by augmenting the model specification with the initial values of the explanatory variables to reduce the finite sample bias. Rabe-Hesketh and Skrondal [2013] showed that this method performs well and allows for a more flexible model [11].
Therefore, the unit-specific unobserved c_i can be written as:

$$c_i = \alpha_0 + \alpha_1 y_{i0} + \overline{Z}_i \alpha_2 + Z_{i0} \alpha_3 + a_i \tag{1.2}$$

The initial value of the explained variables is represented by y_{i0} and the initial value of explanatory variables by Z_{i0}. $\overline{Z}_i$ represent the within-unit average for the explanatory variables averaged for all periods. a_i is a unit-specific time-constant error term, which is normally distributed. As mentioned in Rabe-Hesketh and Skrondal [2013], unobserved heterogeneity is captured by α_1 y_{i0} representing the initial period of the response variable, as well as $Z_i 0$ α_3 corresponding to the initial period of the time-varying explanatory variables, and Z_i α_2, the within-unit averages of the time-varying explanatory variables.

[11] We make use of the Stata package xtpdyn [Grotti and Cutuli, 2018] to implement this estimation.

1.5 Results

The econometric model presented in Section 1.4.2 is estimated for our sample. We presents the results in two parts. First, we present the main regression results to study how the type of contract and other individual characteristics affects the poverty risk. Then, we present a heterogeneity analysis by studying how the risk of poverty associated with contract types differs by gender and relationship status.

1.5.1 Main results

Table 1.5 presents the estimated coefficients for our primary model. For more detailed results, Table 1.10 in the Appendix presents several modelisations with the progressive addition of controls. We show that our model is consistent because the direction and significance of the coefficients associated with the type of contract are not affected by adding variables.

To facilitate the interpretation of our model, we compute the Average Partial Effects (APE)[12]. This allows us to understand the magnitude of the effect of temporary contracts and state dependency of poverty.

Regarding the poverty dynamics itself, we find a substantial and statistically significant coefficient associated with poverty status in the previous period ($AROP_{t-1}$), meaning that being exposed to poverty in the previous year increases the poverty risk in the current year. This coefficient can be considered as the 'causal' effect of previous poverty status on the current poverty status, that is, poverty's 'true' state dependency. Looking at the Average Partial Effects (APE), we find that being at risk of poverty in the previous year increases the probability of future poverty status by 10.8%.

We also show a strong endogeneity of initial conditions as being at risk of poverty at the first period of analysis increases by 9.1% the poverty risk of the household. Focusing on the implication of the contract type, being on a temporary contract increases the poverty risk compared to being on a permanent contract. More specifically, the risk of poverty is high, particularly for temporary agency contracts. This is also the case for fixed-term contracts with less than one year, with an increased poverty risk at 3.1%. The risk of poverty is lower for fixed-term contracts between 1 and 2 years. Then this risk increases again for a longer contract duration. The particularly strong risk of poverty associated with temporary agency contracts is in

[12]For more details, see Wooldridge [2005]

line with the results reported by Laß and Wooden [2020] work. They show that temporary agency workers face lower disposable incomes than permanent workers due to lower hours. This type of worker also tends to live in larger households, thus increasing financial needs. In our sample, we observe that the household size of temporary agency workers is at 2.58 on average, while at around 2.41-2.52 for other temporary contract types. Also, temporary agency workers tend to have more children on average than other temporary workers, which tends to increase household needs. Contrary to Laß and Wooden [2020], who found that fixed-term contract workers have higher disposable income than those under a permanent contract, here we find a significant increase in the poverty risk for all types of temporary contract workers in comparison to permanent ones. Being on a fixed-term contract between 1 and 2 years seems to be associated with a lower risk of poverty than other types of temporary contracts. The chances of being poor increase by (only) 1.1% when under a fixed-term contract with 1-2 years, while it is at 2.3% for a more extended contract's duration. One possible explanation for this result is that workers with relatively long fixed-term contracts may be more likely to be trapped in this type of contract than those with shorter contracts. In our sample, around 40% of fixed-term contracts $>$ 2 years remain in this type of contract. Gagliarducci [2005] has shown that although the chances of finding a permanent contract tend to increase with the duration of the temporary contracts, this relationship is not linear. The probability of conversion to a permanent contract increases at first and then falls in the long run. In that sense, there is a risk of being trapped reappearing beyond a specific contract duration. This might lead to a higher poverty risk of more extended temporary contracts than medium duration.

As for other individuals' characteristics, we show that being a woman and the primary earner in the household is associated with a higher risk of poverty, while being in a couple decreases the poverty risk by 35%. We show that relationship status plays thus a significant role in determining poverty. This will need to be considered if we want to assess how the contract impacts poverty. We describe this more in detail in section 1.5.2. We show that the number of children increases the risk of poverty in the household, which is in line with previous work (Ayllón [2013], Fabrizi and Mussida [2020] among others). Poverty risk also increases with the presence of the elderly in the household. On the contrary, the poverty risk tends to decrease with age.

We also show that social assistance benefits decrease this risk by 1%. Having a

second job strongly decreases the risk of poverty of individuals (reduction by 12.7%). Regarding time-average effects, more specifically, we find a strong effect of being on temporary agency contracts and fixed-term contracts under one year (it increases the risk of poverty from 6% and 3.2%, respectively). Being under a fixed-term contract over one year has no significant effect on the risk of poverty. Regarding out-of-work benefits, social assistance benefits are associated with a reduced poverty risk, while the receipt of unemployment benefits does not seem to play a role.

Overall, we highlight a significantly higher risk of poverty for all types of temporary contracts compared to permanent contracts. The risk is particularly high for very short-term temporary contracts. Being in a couple strongly decreases the poverty risk. We also endorse that the poverty risk appears to be long-lasting, as we find strong state-dependency of poverty.

Table 1.5: Correlated random effects probit model with endogenous initial conditions

	AROP		
	Coefficients	Standard Errors	APE
AROP t-1	0.956***	(0.02)	0.108
Contract type (ref. Permanent contract)			
Temporary agency	0.414***	(0.06)	0.031
Fixed term < 1 year	0.396***	(0.05)	0.031
Fixed term 1-2 years	0.182**	(0.05)	0.011
Fixed term > 2 years	0.325***	(0.05)	0.023
Education level (ref. no degree)			
Secondary degree	-0.172***	(0.03)	-0.016
Intermediate degree	-0.468***	(0.03)	-0.039
Technical school degree	-0.692***	(0.03)	-0.052
Upper secondary degree	-0.786***	(03)	-0.058
Other school degree	-0.062	(0.15)	-0.009
Age	-0.021***	(0.00)	-0.001
Women	0.194***	(0.04)	-0.005
Couple	-0.725***	(0.05)	-0.350
Couple * Women	-0.571***	(0.05)	
Number of children	0.036	(0.02)	0.004
Household size	-0.232***	(0.02)	0.003
Worktime per week	-0.021***	(0.00)	-0.001
Unemployment benefits/100	-0.000	(0.00)	0.001
Social assistance benefits/100	-0.016***	(0.00)	-0.010
Second job	-0.177***	(0.05)	-0.127
Health	0.024**	(0.01)	-0.001
West germany	0.417***	(0.03)	0.019
Initial values			
.AROP t_0	0.776***	(0.03)	0.091
Temporary agency t_0	-0.081	(0.05)	-0.010
Fixed term < 1 year t_0	-0.041	(0.04)	0.004
Fixed term 1-2 years t_0	0.102	(0.07)	0.003
Fixed term > 2 years t_0	0 0.054	(0.06)	0.006
Couple t_0	0.229***	(0.05)	0.020
Age t_0	0.023***	(0.02)	0.003
Children t_0	-0.060*	(0.02)	-0.003
Household size t_0	-0.013	(0.02)	0.001
Worktime per week t_0	-0.001	(0.00)	0.000
Unemployment benefits t_0	0.000	(0.00)	0.002
Social assistance benefits t_0	0.004*	(0.00)	0.004
Second job t_0	-0.054	(0.07)	0.005
Health t_0	-0.001	(0.01)	-0.001

(continuation)

	AROP		
	Coefficients	Standard Errors	APE
Time average			
Average Temp. contracts	0.682***	(0.15)	0.049
Average Fixed term < 1 year	0.358***	(0.12)	0.025
Average Fixed term 1-2 years	0.399*	(0.18)	0.030
Average Fixed term > 2 years	-0.045	(0.13)	0.010
Couple	-0.099	(0.08)	-0.005
Average Age	-0.013**	(0.00)	-0.001
Average Number of children	0.188***	(0.04)	0.013
Average Household size	-0.119**	(0.04)	-0.008
Average Worktime per week	-0.016***	(0.00)	-0.001
Average Unemployment benefits	0.000***	(3.30)	0.009
Average Social assistance	0.016***	(4.43)	0.014
Average Second job	0.093	(0.95)	0.009
Average Health	0.014	(0.70)	0.002
_cons	0.488*	(2.00)	
Industry	Yes		
var(_cons[pid])			
_cons	0.464***	(0.03)	
N	118,717		
Log lik.	-20663.0		
Chi-squared	11920.2		

t statistics in parentheses

*** denotes statistical significance at the 0.1% level, ** indicates 1% significance level, and * represents 5% significance level.

Being under a temporary contract is associated with an increased risk of poverty. In order to assess better how this affects the dynamics of poverty, Table 1.6 presents the predicted probability of both entering and exiting poverty, the state dependency of poverty, and the proportion of time spent in poverty. We find that the entry probability into poverty is only at 3,8% for permanent contracts while it is at 5% for fixed-term 1-2 years. It goes up to around 7% for both temporary agency and fixed-term less than one-year contracts. We also find a significantly lower probability of exiting poverty for temporary agency and fixed-term less than 1-year workers than other contract types.

Regarding the time spent in poverty, the proportion is only at 4% of total time spent in poverty for permanent workers, while this goes up to 8% for temporary agency and fixed-term contracts of less than one year. Here again, we find that the time spent in poverty tends to be lower for fixed-term 1-2 years workers. We,

therefore, show here that being on a temporary contract implies a greater risk of being poor but also that poverty is more persistent for this type of contract. According to the estimates in Table 1.5, we find that the likelihood of becoming poor and staying poor is lower for fixed-term contracts between 1 and 2 years in comparison to other types of temporary contracts.

Table 1.6: Estimates of transition probabilities according to contract types

	Permanent	Temp. agency	FT< 1 year	FT 1-2 years	FT> 2years
Entry Prob. $P(1\|0)$	0.038	0.069	0.067	0.050	0.061
Exit Prob. $P(0\|1)$	0.865	0.788	0.792	0.834	0.806
State Dep. $P(1\|1)$	0.135	0.212	0.208	0.166	0.194
Prop. time spent in poverty	0.042	0.080	0.078	0.056	0.070

For the poverty dynamic itself, regardless of the type of contract, our previous results from Table 1.5 show how important it is to control for initial conditions. We show that being poor in the first period increases the chances of poverty. We present here how initial poverty shapes future poverty. Figure 1.3 represents the impact of the 'true' state-dependence of poverty across households reporting different initial conditions. This Figure distinguishes across five quantiles of unobserved heterogeneity (i.e. different quantiles of the distribution of the time-varying explanatory variables). On the left-hand side of the graphic, we find the probabilities for households who are not in a situation of poverty in the initial conditions ($AROP_{t0} = 0$) and the right-side for the households being poor in the initial condition ($AROP_{t0} = 1$). The black dots represent the probability of remaining poor if the household is in poverty the previous year ($AROP_{t-1} = 1$), and the grey dots are the entry probability into poverty when being not poor the previous year ($AROP_{t-1} = 0$). The difference between the black and white lines represents the marginal effects of the true state dependency of poverty at each level of unobserved heterogeneity.

This Figure shows that first, regardless of the unobserved heterogeneity distri-

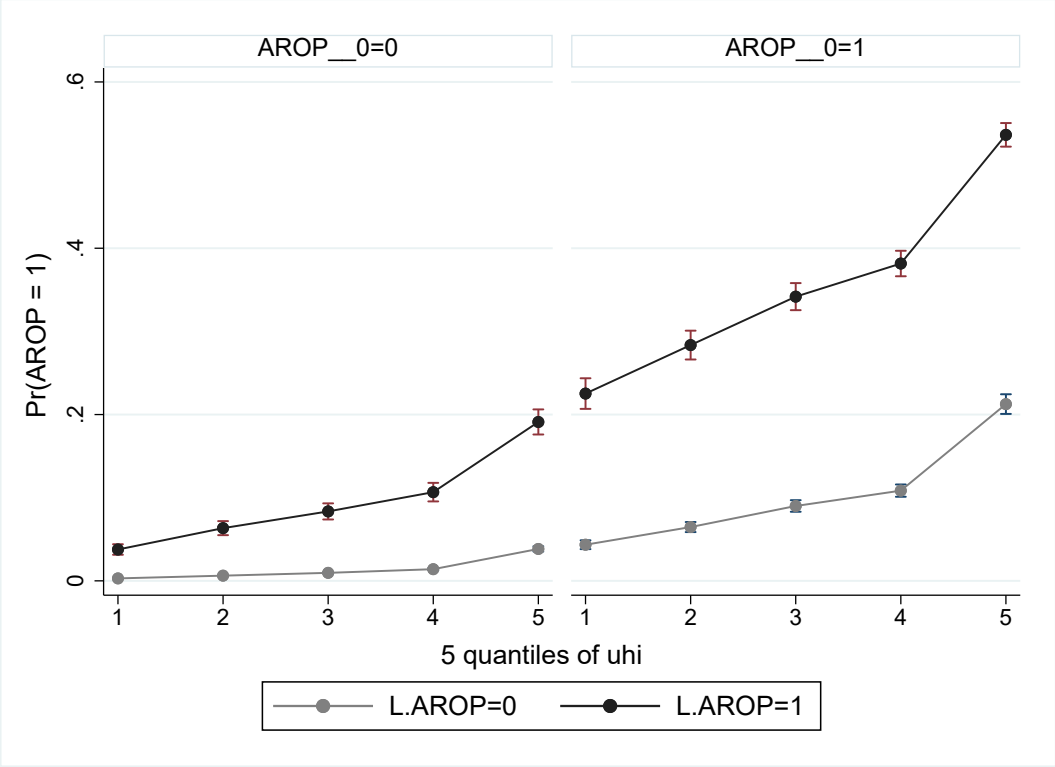


Figure 1.3: Predicted probability of being At risk of poverty (AROP)

bution, households being at poverty as an initial condition ($AROP_{t_0} = 1$) have a higher probability of being currently poor in comparison to households not poor as initial condition ($AROP_{t_0} = 0$). Across the unobserved heterogeneity distribution, the poverty risk increases, indicating the relevance of unobserved heterogeneity in shaping poverty risk. We observe that the gap between the grey and the black lines is much wider for individuals poor as initial conditions. This gap consists of the difference between the probability of being poor while poor last year (($AROP_{t-1} = 1$) and the probability of being poor while not poor last year. This gap represents the state-dependency of poverty, and we show that this state-dependency is higher for individuals already poor at the beginning of the observed period.

1.5.2 Poverty incidence: heterogeneity analysis

In this section, we study how the poverty risk associated with temporary contracts might differs regarding the gender and the relationship status. Indeed, one would expect that being a single woman, perhaps with a child and on a temporary contract, would have a different poverty risk than being in couple or being a man. It has

already been shown that household composition and the presence of children have significant effect on poverty. The risk of poverty tends to increase with the number of children in the household, regardless of the contract type, as shown by Ayllón [2013][13] and Fabrizi and Mussida [2020] among others. Particularly, being a single adult is associated with higher poverty risk [OECD, 2014, Fabrizi and Mussida, 2020][14].

Regarding the study of temporary contracts' implication on poverty, existing work already brought a gender perspective and tended to highlight different results. For example, Van Lancker [2012] has shown that, contrary to what was expected, the risk of poverty is lower for women than for men, all other things being equal. On the other hand, the work of Amuedo-Dorantes and Serrano-Padial [2010] found that being under a temporary contract is associated with a significantly higher risk of poverty for women, regardless of age. In contrast, this contract only increases the risk of poverty for young men. However, there is no study on the poverty risk of temporary workers separated not only by gender but also by marital status.

We study how the poverty risk differs whether individuals are single women, single men, women in couples or men in the couple. In Table 1.7, we present the results for the model estimated with the interaction between the type of contract and the four gender and relationship categories. Then we run a separate analysis by relationship status and gender. This allows us to study poverty's state dependency and compute the Average Partial Effects (APE) to better measure the effect of contract types according to relationship status and gender. The results of the separate analysis can be found in Table 1.11. We selected individuals who were in-couple and single for the entire observed period.

Table 1.7 presents the estimates for the model augmented with the interaction between contract and relationship status. First, we show that being a single woman and a single man increases the risk of poverty. On the contrary, being in a couple is not associated with a significant increase in poverty risk. Regarding the type of contract, we show that being on a temporary agency contract, regardless of the duration, is associated with an increased poverty risk for single men only. We only find an increased risk of poverty for single women under a temporary agency contract, although more weakly significant.

[13]Ayllón [2013] showed that having children increased the risk of poverty and that cohabiting with other adult decrease this risk.

[14]Fabrizi and Mussida [2020]also show that single parents especially have higher risk of poverty.

Table 1.7: CRE with endogeneous initial conditions: interaction contract and relationship status

	Coefficient	SE
AROP $t-1$	0.948***	(38.24)
AROP t_0	0.791***	(25.49)
Temporary agency	0.229*	(2.15)
Fixed-term < 1 year	0.273***	(3.71)
Fixed-term 1-2 years	0.146	(1.56)
Fixed-term >2 years	0.220**	(2.78)
Couple women	0.121	(1.16)
Single men	0.433***	(5.47)
Single women	1.495***	(12.92)
Temp. agency * Couple women	0.0207	(0.13)
Temp. agency * single men	0.494**	(2.97)
Temp. agency * single women	0.328*	(2.26)
Fixed-term <1 year * Couple women	0.0266	(0.23)
Fixed-term <1 year * Single men	0.408***	(3.51)
Fixed-term <1 year * Single women	0.184	(1.90)
Fixed-term 1-2 years * Couple women	-0.0659	(-0.45)
Fixed-term 1-2 years * Single men	0.400**	(3.06)
Fixed-term 1-2 years * Single women	-0.0336	(-0.28)
Fixed-term 2+ years * Couple women	0.105	(0.82)
Fixed-term 2+ years * Single men	0.372**	(3.07)
Fixed-term 2+ years * Single women	0.0854	(0.79)
Number of children	0.0332	(1.42)
Household size	0.226***	(8.62)
Working time	-0.0195***	(-13.67)
Unemployment benefits	-0.0000163	(-1.00)
Social assistance	-0.0165***	(-7.11)
Second job	-0.181***	(-3.34)
Health	0.0234*	(2.58)
West Germany	0.417***	(15.39)
Industry	Yes	
Initial values	Yes	
_cons	-0.264*	(-2.11)
var(_cons[pid])		
_cons	0.494***	(18.81)
N	118717	
Log lik.	-20186.5	
Chi-squared	11404.8	

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1.8 presents the estimates and Average Partial Effects (APE) separately for single women, single men, and in-couple men and women. The first finding is that being on a temporary contract seems to be significantly associated with a higher risk of poverty only for single individuals. In fact, for couples, being on a temporary agency contract is (weakly significant) associated with a higher risk of poverty than permanent contracts only for men in a couple. Otherwise, the type of contract does not appear to play a role in determining the poverty of in-couple households. The poverty risk of couples seems to be driven mainly by the education level and being poor in previous periods. We also show that the state dependency of poverty is much stronger for single individuals than in-couple ones. Being poor in the previous year increases by 9.3% and 7.7% the risk of poverty of couple women and men respectively. This risk is at 13.7% and 12.2% for single women and men respectively. This highlights an increased risk of poverty for women in comparison to men, regardless of the relationship status.

Regarding the implication of temporary contracts for single individuals, as found in section 1.5.1, temporary agency and less than one-year contracts mainly involve greater poverty risk. Table 1.8 shows that for single women, being on a temporary agency contract highly increases the probability of being poor, as this risk increases by 13.1%. Single men tend to be exposed to the risk of poverty, especially under a fixed-term contract of less than one year, as this risk increased by 7% (at 5.5% for single women). Being on a fixed-term contract of more than one year is associated with an increased risk of poverty for single men, while it does not affect the risk of poverty for single women. For single men, being on a fixed-term contract of 1-2 years increases the poverty risk by 4.1%. This rate is at 3.5% for fixed-term contracts with a longer duration. Social assistance benefits reduce the risk of poverty for all individuals. This is especially true for single women.

Table 1.8: Correlated random probit model separated by gender and marital status: selected coefficients

	Single women		Single men		Couple women		Couple men	
	Coeff.	APE	Coeff.	APE	Coeff.	APE	Coeff.	APE
AROP $t-1$	0.755***	0.137	1.043***	0.122	1.116***	0.093	0.952***	0.077
	(14.72)		(9.36)		(13.29)		(20.93)	
AROP t_0	0.747***	0.127	0.970***	0.101	1.010***	0.076	0.990***	0.076
	(11.46)		(6.52)		(8.82)		(17.35)	
Temp. agency	0.736***	0.131	0.408	0.036	0.257	0.013	0.268*	0.015
	(5.30)		(1.73)		(1.24)		(2.03)	
Temp.cont.	0.344***	0.055	0.710***	0.070	0.181	0.009	0.183	0.001
<1 year	(3.60)		(4.20)		(1.11)		(1.85)	
Temp. cont.	-0.132	-0.019	0.449**	0.041	-0.0572	-0.002	0.200	0.011
1-2 years	(-1.15)		(2.60)		(-0.24)		(1.58)	
Temp. cont.	0.192	0.030	0.393*	0.035	0.080	0.004	0.179	0.010
> 2 years	(1.62)		(2.06)		(0.43)		(1.69)	
Second. degree	-0.0550	-0.010	-0.406**	-0.036	-0.110	-0.007	-0.214***	-0.015
	(-0.59)		(-3.19)		(-1.01)		(-4.45)	
Inter. degree	-0.319***	-0.052	-0.591***	-0.055	-0.416***	-0.024	-0.557***	-0.033
	(-3.60)		(-4.75)		(-4.35)		(-9.95)	
Techn. degree	-0.569***	-0.086	-0.905***	-0.077	-0.740***	-0.036	-0.743***	-0.040
	(-4.69)		(-4.80)		(-4.23)		(-7.91)	
Upper sec.	-0.550***	-0.105	-0.699***	-0.063	-0.738***	-0.036	-1.022***	-0.048
degree	(-5.81)		(-5.46)		(-6.07)		(-14.42)	
Age	-0.0263***	-0.004	0.000978	0.001	-0.00381	-0.001	-0.0125**	-0.001
	(-3.29)		(0.09)		(-0.44)		(-2.80)	
Number of	-0.0223	-0.003	0.200	0.016	-0.0581	-0.003	0.0690*	0.003
children	(-0.36)		(1.13)		(-0.62)		(2.08)	
Working hours	-0.0203***	-0.003	-0.0232***	-0.002	-0.0221***	-0.001	-0.0143***	-0.001
	(-6.48)		(-4.29)		(-4.63)		(-4.50)	
Soc. assist. ben.	-0.0172***	-0.003	-0.0291**	-0.002	-0.0228**	-0.001	-0.0121*	-0.000
	(-4.12)		(-2.99)		(-2.80)		(-2.27)	
N	20726		13088		22099		62804	

*** denotes statistical significance at the 0.1% level, ** indicates 1% significance level, and * represents 5% significance level.

See Table 1.11 for the presentation of all coefficients.

Finally, we observe that the findings presented in section 1.5.1 (i.e. that being on a temporary contract increases the risk of poverty) are mainly driven by a clear risk of poverty for single individuals. Table 1.7 shows that poverty is mainly associated with poverty for single men, although it also affects single women under temporary agency contracts. By running a separate analysis, Table 1.8 supported the findings that single women are particularly at risk of poverty while under temporary agency contracts. We show that fixed-term contracts with low duration drive the high risk of poverty for single men on temporary contracts. Being on a temporary contract when in couple, regardless of gender and although being the primary worker in the household, does not imply a greater risk of poverty. Besides the type of contract, single individuals tend to have stronger state dependency of poverty than individuals in couple, implying that single individuals under temporary contract have a higher risk of both being and staying poor. The risk of poverty and the state-dependency is overall higher for women. These results go in the opposite direction of works such as Van Lancker [2012], which found lower poverty risk for women, explaining this to their probable secondary earner status. Indeed, when we look only at primary earners, women have a higher risk of poverty, even in couple.

1.6 Conclusion

This paper examines the relationship between poverty and temporary employment by estimating a correlated dynamic random effects probit model with endogenous initial conditions [Wooldridge, 2005] augmented with initial period of explanatory variables. This allowed us to take into account unobserved heterogeneity as well as being able to determine the state dependency of poverty.

One of the key results is that being on a temporary contract, regardless of the duration, tends to increase the probability of poverty compared to permanent contracts. We show that this risk is especially high for temporary agency workers. In contrast, the poverty risk associated with medium-term temporary contracts, between 1 and 2 years, is lower than other temporary contracts. This corroborates with previous results showing that the trap to staying in a temporary contract is reduced with the duration of employment until a certain threshold where the trend is reversed, which might explain the same tendency observed here for poverty. By further detailing the dynamics of poverty, we show that the probability of becoming poor is higher for temporary contracts, and the chances of getting out of this state are largely re-

duced. We also show that these results are mainly driven by the condition of single individuals, particularly single women. While other papers have already studied the gender dimension, we add this literature by considering relationship status. We show that being on a temporary contract when individuals are in couple and the primary earner does not lead to an additional risk of poverty. Thus, the economic insecurity generated by temporary contracts specifically concerns single individuals.

Our main conclusion is: being on a temporary contract induces a higher risk of entering and remaining poor than on permanent contracts. This risk is particularly high for temporary agency and short-term contracts, then it reduces for medium-term contracts and increases again. This increased risk of poverty is particularly true for single individuals. At the same time, being on a temporary contract does not significantly induce a higher risk of poverty for couples.

These results are of interest in terms of public policies to fight poverty. We have robustly demonstrated and measured the state dependency of poverty, meaning that poverty itself, independently of other reasons, cause future poverty. It should be kept in mind that anti-poverty policies have a more significant impact than just fighting poverty in a contemporary way. It helps to reduce future poverty too. Therefore, we must also consider policies that prevent poverty from generating future poverty. Direct financial support to rapidly lift people out of poverty, such as increases in the minimum wage, in-work benefits or child benefits, would be beneficial. Not least because being a single woman with children greatly increases the risk of poverty. Germany has had a minimum wage since 2015, which can significantly affect temporary workers. In-work benefits per se do not exist in Germany. However, there have been Mini-jobs since 2003 [15]. This does not depend on the family composition and the number of children. Therefore this program aims more at increasing employment rather than having distributional effects.

Another way of combating poverty among people in temporary employment would be to improve the operation of family allowances in Germany, which currently do not benefit the most precarious individuals. Bonin et al. [2016] has shown that lone parents for long spells tend to receive less financial support than individuals in a couple in Germany. Strengthening these policies seems to be a lever to reduce the increased poverty risk of single women on temporary contracts.

Finally, as these workers have an incomplete attachment to the labour market,

[15]Mini-job consists of the exemption from tax and social insurance contributions of low earners.

there is also a need to improve income protection and access to social security to reduce their exposure to poverty. Jara Tamayo and Tumino [2021] and Jara and Simon [2021] highlighted that atypical workers and, more specifically, temporary workers have difficulty accessing unemployment benefits in case of job loss. Jara and Simon [2021] showed that up to 15% of temporary workers would fall into poverty in case of termination of their contract in Germany. Improving access to social security, such as unemployment benefits, can also be one of the essential levers to reduce the economic precariousness of temporary workers.

Appendix

Table 1.9: Prevalence of poverty among contract types

	Permanent	Temp. agency	FT $<$ 1 year	FT 1-2 years	FT $>$ 2 years
2000	6.49	33.85	35.03	22.62	16.44
2010	10.03	38.74	39.93	36.03	21.89
2019	10.48	46.58	41.53	38.31	18.42
All periods	8.69	35.25	36.10	28.94	19.47
Average poverty spell	2.78	2.65	2.78	2.78	2.87

Table 1.10: Correlated random probit model with endogeneous intial condition: basic specification

	Model 1	Model 2	Model 3	Model 4	Model 5
1L.AROP	1.105***	1.100***	1.047***	1.026***	1.019***
	(43.58)	(43.48)	(41.45)	(40.97)	(41.24)
1.contract	0.390***	0.386***	0.400***	0.404***	0.430***
	(6.23)	(6.19)	(6.37)	(6.49)	(6.92)
2.contract	0.377***	0.375***	0.382***	0.391***	0.407***
	(8.58)	(8.54)	(8.60)	(8.82)	(9.22)
3.contract	0.185***	0.186***	0.184***	0.190***	0.205***
	(3.52)	(3.55)	(3.48)	(3.59)	(3.86)
4.contract	0.307***	0.306***	0.311***	0.322***	0.327***
	(6.06)	(6.05)	(6.09)	(6.34)	(6.42)
1.AROP__0	1.119***	1.091***	1.127***	1.049***	0.943***
	(32.44)	(31.86)	(32.01)	(30.71)	(29.36)
2.sex		0.253***	0.130***	0.122***	0.170***
		(11.55)	(5.55)	(5.13)	(7.24)
1.couple			-0.686***	-0.770***	-0.782***
			(-16.33)	(-18.32)	(-18.48)
children				0.213***	0.212***
				(12.98)	(12.82)
1.heduc					-0.161***
					(-4.90)
2.heduc					-0.420***
					(-13.08)
3.heduc					-0.795***
					(-15.00)
4.heduc					-0.875***
					(-24.22)
5.heduc					-0.00514
					(-0.03)
_cons	-2.451***	-2.538***	-2.262***	-2.346***	-1.870***
	(-106.62)	(-101.29)	(-70.85)	(-72.07)	(-48.30)
var(_cons[pid])					
_cons	0.706***	0.695***	0.726***	0.663***	0.573***
	(20.81)	(20.64)	(20.94)	(20.20)	(19.45)
N	120562	120562	120562	120562	120403
Log lik.	-23279.9	-23210.3	-22812.4	-22422.1	-21910.7
Chi-squared	10447.2	10555.0	10385.5	10652.6	11215.3

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1.11: Correlated random probit model with endogeneous intial condition: separated by gender and marital status

	Single women Coefficient	Single men Coefficient	Couple women Coefficient	Couple men Coefficient
1L.AROP	0.706***	1.032***	0.912***	0.911***
	(19.13)	(15.56)	(15.93)	(26.14)
1.contract	0.671***	0.675***	0.206	0.266*
	(6.29)	(4.12)	(1.30)	(2.39)
2.contract	0.433***	0.781***	0.258*	0.250**
	(5.96)	(6.45)	(2.26)	(3.19)
3.contract	0.0465	0.518***	0.188	0.117
	(0.53)	(3.76)	(1.32)	(1.16)
4.contract	0.224*	0.622***	0.184	0.278**
	(2.42)	(4.80)	(1.33)	(2.94)
1.heduc	0.0254	-0.313**	-0.0663	-0.186***
	(0.35)	(-2.96)	(-0.69)	(-3.98)
2.heduc	-0.279***	-0.467***	-0.321***	-0.519***
	(-4.10)	(-4.55)	(-3.62)	(-9.87)
3.heduc	-0.479***	-0.825***	-0.631***	-0.757***
	(-4.91)	(-4.93)	(-4.05)	(-8.76)
4.heduc	-0.595***	-0.558***	-0.628***	-0.957***
	(-8.05)	(-5.31)	(-6.23)	(-14.75)
5.heduc	-0.467	0.971*	0.317	-0.269
	(-1.52)	(2.10)	(0.91)	(-1.09)
age	-0.0315***	-0.0175*	-0.0157*	-0.0141***
	(-5.84)	(-1.96)	(-2.27)	(-3.65)
children	0.0360	-0.0958	-0.0836	0.0497
	(0.74)	(-1.00)	(-1.22)	(1.61)
hhsize	0.283***	0.363**	0.233**	0.204***
	(5.47)	(3.22)	(3.29)	(5.98)
worktime	-0.0227***	-0.0240***	-0.0185***	-0.0154***
	(-9.66)	(-6.54)	(-5.33)	(-6.59)
ub	-0.0000756**	0.0000725	0.0000338	-0.00000441
	(-2.86)	(1.61)	(0.78)	(-0.23)
socasist	-0.0186***	-0.0288**	-0.0169**	-0.0134***
	(-6.85)	(-2.94)	(-3.28)	(-3.49)
secondjob	-0.155	-0.230	-0.134	-0.313**
	(-1.94)	(-1.00)	(-0.93)	(-3.06)
health	0.0355*	0.0607*	0.0394	0.00237
	(2.04)	(2.09)	(1.59)	(0.19)
2.region	0.403***	0.504***	0.539***	0.389***
	(8.24)	(6.70)	(8.12)	(8.54)

(continuation)

	(1) Single women	(2) Single men	(3) Married men	(4) Married women
1.industry	-0.158	-0.432	-0.0244	0.121
	(-0.52)	(-1.15)	(-0.05)	(0.63)
2.industry	0.415	-0.0658	-0.575	-0.224
	(0.80)	(-0.12)	(-0.92)	(-0.94)
3.industry	0.248	-7.384	36.32	-0.374
	(0.00)	(-0.00)	(0.00)	(-0.95)
4.industry	-0.0261	-0.253	-0.0791	-0.0111
	(-0.20)	(-1.40)	(-0.44)	(-0.13)
5.industry	0.202	-0.353	-0.272	-0.0764
	(0.84)	(-1.59)	(-0.90)	(-0.71)
6.industry	0.0571	-0.310	-0.232	0.0637
	(0.46)	(-1.59)	(-1.32)	(0.62)
7.industry	0.251	-0.524*	-0.221	0.175
	(1.47)	(-2.40)	(-0.80)	(1.49)
8.industry	-0.492*	0.0814	0.0683	-0.280
	(-2.08)	(0.19)	(0.13)	(-0.96)
9.industry	-0.00832	-0.191	-0.138	-0.0445
	(-0.07)	(-1.09)	(-0.91)	(-0.44)
10.industry	0.0436	-0.236	-0.0537	-0.0878
	(0.25)	(-0.74)	(-0.20)	(-0.41)
AROP t_0	0.897***	0.995***	1.335***	1.097***
	(17.31)	(10.17)	(14.48)	(21.63)
Temp. agency t_0	-0.121	0.0227	-0.342*	-0.0152
	(-1.18)	(0.13)	(-2.16)	(-0.14)
FT <1 year t_0	-0.0125	0.175	-0.199	-0.0772
	(-0.16)	(1.34)	(-1.59)	(-0.92)
FT 1-2 years t_0	0.238	0.142	0.0831	0.0802
	(1.94)	(0.74)	(0.47)	(0.59)
FT >2 years t_0	-0.00594	0.0913	-0.154	0.145
	(-0.05)	(0.50)	(-0.83)	(1.33)
Age t_0	0.00847	0.0240	0.0180*	0.0356***
	(1.14)	(1.92)	(1.96)	(6.01)
Children t_0	-0.0491	-0.0511	0.0602	-0.102**
	(-0.88)	(-0.47)	(0.86)	(-3.04)
HH size t_0	0.0325	-0.106	-0.0405	-0.0111
	(0.57)	(-0.93)	(-0.58)	(-0.33)
Worktime t_0	0.00111	0.00168	-0.00530	-0.000865
	(0.43)	(0.39)	(-1.40)	(-0.33)

(continuation)

	(1) Single women	(2) Single men	(3) Married men	(4) Married women
ubt_0	-0.0000208	0.0000523	0.0000510	0.0000139
	(-0.85)	(1.53)	(1.53)	(0.93)
socasistt_0	0.00502	-0.0139	0.0170***	0.00334
	(1.91)	(-1.25)	(3.58)	(0.86)
secondjob t_0	0.0465	0.225	-0.0283	-0.157
	(0.43)	(1.00)	(-0.15)	(-1.16)
healtht_0	0.00154	0.0116	-0.0361*	-0.00315
	(0.12)	(0.50)	(-2.22)	(-0.34)
m1__contract	0.144	0.722*	0.887*	0.413
	(0.53)	(1.97)	(2.49)	(1.52)
m2__contract	0.584**	-0.285	0.777**	0.505*
	(2.91)	(-0.96)	(2.88)	(2.38)
m3__contract	0.375	0.274	-0.401	0.683*
	(1.37)	(0.68)	(-0.99)	(2.13)
m4__contract	0.0552	-0.289	0.561	-0.224
	(0.24)	(-0.91)	(1.77)	(-0.96)
m__age	0.00727	-0.0142	-0.00363	-0.0327***
	(0.79)	(-0.93)	(-0.31)	(-4.60)
m__children	0.189	0.401*	0.0859	0.0783
	(1.96)	(2.15)	(0.66)	(1.26)
m__hhsize	-0.338***	-0.361	-0.0898	0.0133
	(-3.45)	(-1.93)	(-0.69)	(0.21)
m__worktime	-0.0238***	-0.0269***	-0.0112	-0.0102*
	(-5.60)	(-3.78)	(-1.83)	(-2.33)
m__ub	0.000167**	-0.0000710	-0.0000612	0.0000778*
	(2.88)	(-0.81)	(-0.64)	(2.00)
m__socasist	0.0120*	0.0582**	-0.00146	0.0116
	(2.31)	(3.20)	(-0.15)	(1.44)
m__secondjob	0.235	-0.555	0.0398	0.191
	(1.22)	(-1.08)	(0.12)	(0.89)
m__health	0.0572	-0.0165	0.0178	0.0361
	(1.76)	(-0.31)	(0.40)	(1.49)
_cons	0.446*	1.081***	-1.457***	-1.082***
	(2.15)	(3.88)	(-4.77)	(-5.74)
_cons	0.516***	0.585***	0.551***	0.536***
	(11.07)	(6.36)	(7.35)	(12.76)
N	20726	13088	22099	62804
Log lik.	-6441.4	-2219.6	-2735.4	-8187.2
Chi-squared	3045.0	1344.3	1355.1	4280.0

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Chapter 2

The income protection role of an EMU-wide unemployment insurance system: the case of atypical workers

This chapter was co-authored with

Xavier Jara Tamayo

Summary of the chapter

This paper evaluates the potential of a common unemployment insurance scheme for the Economic and Monetary Union (EMU-UI) to improve the income protection of atypical workers, namely those in part-time and temporary contracts. Our approach relies on simulating entitlements to national unemployment insurance and the EMU-UI to assess their effects on the household disposable income of atypical workers in the event of unemployment. Our results show that introducing an EMU-UI would reduce coverage gaps and increase net replacement rates, especially for atypical workers, and protect a large share of the workforce against the risk of poverty. Extending eligibility for the EMU-UI to the self-employed would further improve income protection, reducing their risk of falling into poverty in the event of unemployment.

2.1 Introduction

The idea of a supranational fiscal instrument in the EU based on risk sharing is not new, dating back to proposals by Marjolin [1975] and MacDougall [1977]). The subprime and sovereign debt crises have revived the debate on the need for a common budgetary instrument for the EMU to make it more resilient to shocks. The Van Rompuy et al. [2012] , the Five Presidents' Report [Juncker et al., 2015] and the Meseberg declaration (2018) put this project back at the heart of the debate. This fiscal tool is often described as an unemployment benefit scheme as it would have three main functions. It would provide geographical insurance between member states as the budget would be pooled and redistributed between countries, sharing risk between EMU member states [Alcidi et al., 2016, Dolls et al., 2018]. Secondly, this scheme would allow for inter-temporal insurance as most EMU-UI proposals include the possibility for the EMU fund to incur debt. The third function of this scheme, on which this paper focuses, is enhancing income protection in the event of unemployment. The introduction of an EMU-UI would establish common minimum standards in terms of the eligibility criteria and generosity of unemployment benefit systems. This could strengthen the counter-cyclical capacity of national systems by improving the replacement and coverage rates of unemployment benefits which as things stand, leave large coverage gaps between countries [Esser et al., 2013]. The recent debate regarding the value of a common unemployment insurance system for the EMU (EMU-UI) could also be considered in the context of the requirements of the European Pillar of Social Rights, which proclaims under principle 12, that 'regardless of the type and duration of their employment relationship, workers, and, under comparable conditions, the self-employed, have the right to fair and equal treatment regarding working conditions, access to social protection and training.'. In practice, existing unemployment benefit systems differ greatly between EU countries in terms of accessibility and generosity, as noted by Esser et al. [2013]. In particular, atypical workers are less likely to access national unemployment insurance benefits and are more exposed to the risk of poverty [Jara Tamayo and Tumino, 2021]. As atypical work, specifically temporary contracts, part-time work and self-employment, has become more common in recent years in EU countries [European Commission, 2018a], an EMU-UI could establish common minimum protection standards for all types of workers in the event of unemployment, to ensure atypical workers are protected. The EMU-UI project seems even more relevant today in the midst of the COVID-19 pandemic that has affected economies throughout the Eurozone and forced countries to

implement emergency policies to protect workers from the downturn, for instance by relaxing eligibility conditions for unemployment benefits to cover vulnerable workers who would not otherwise meet the requirements. Providing income protection to part-time workers and the self-employed has been crucial and most EMU countries have implemented specific schemes to protect them. This crisis has highlighted the importance of making unemployment benefit systems more accessible to all workers. Rather than modifying national systems individually, how would a common system of unemployment benefits perform? The aim of this paper is to assess the extent to which an common EMU-UI could enhance income protection for atypical workers in the event of unemployment. Regarding the design of the EMU-UI, two main proposals have been put forward. The first is a contingent system that triggers payments based mainly on deviations in the unemployment rate from long-run tendencies and which is better described as a re-insurance system [Beblavỳ and Maselli, 2014, Beblavỳ et al., 2015, Card et al., 2007]. The other proposal is a genuine system, consisting of a common unemployment benefit system, as discussed by Strauss et al. [2013], Dullien [2014], and Andor [2016] among others. One of the most complete and widespread proposals is Dullien [2014]. They propose a basic Eurozone-wide unemployment insurance scheme for short-term unemployment. As a common unemployment insurance, it would imply minimal standards for all member states. This EMU-UI would support the income of the unemployed at 50% of gross earnings for up to 12 months and would require contributions for at least 3 months in the last 12. We base our analysis mainly on the latter proposal and assess the level of income protection it would offer. More precisely, make use of EUROMOD, the EU-wide tax-benefit model based on household survey data, to simulate individual transitions from work to unemployment and assess the distributional implications of an EMU-UI by computing the potential coverage, net replacement rates and risk of poverty under national and EMU UI systems. We run the analysis for all workers and separate out results for part-time workers, workers with temporary contracts, the self-employed and the 3% most at risk of unemployment. We complement our analysis by presenting the budgetary implications of these EMU-UI proposals. To our knowledge, this is the first paper that provide insights into the income protection role of an EMU-UI for the specific case of atypical workers. Our results confirm the disparities of access to unemployment benefits between EMU countries, especially for atypical workers. The potential coverage of national UI systems tends to be lower on average for atypical workers, being less than 60% in seven EMU countries for

part-time and temporary contract workers. The net replacement rates of national systems are similar on average across the EMU for the working population as a whole but are more variable for temporary contract workers. We find that introducing an EMU-UI would increase the potential coverage of UI systems and net replacement rates in all countries but to a lesser extent in countries such as France, Belgium and Austria, with relatively generous national systems. The EMU-UI would fill existing gaps between countries by increasing potential coverage rates to above 70% in all countries and increasing net replacement rates where national systems are currently less generous. This scheme would also protect a significant portion of workers from falling into poverty on becoming unemployed, especially in Italy, Estonia and Ireland. The article is organized as follows. Section 2 provides a brief literature review. Section 3 discusses the design of an EMU-UI. Section 4 describes the data and the methodology. Section 5 analyses the extent to which atypical workers would be protected by the introduction of an EMU-UI. Section 6 presents the results of an alternative scenario in which the self-employed would be entitled to an EMU-UI. The article ends with a concluding discussion.

2.2 Related literature

This paper relates two strands of the literature. First, it expands the literature on the implications a common unemployment benefit system for the Eurozone. Previous research on the EMU-UI has mainly focused on the stabilizing power or the budgetary feasibility of the scheme. Dolls et al. [2018] assess the income stabilisation effect of a European unemployment insurance and budgetary issues related to its introduction. They run simulations from 2000-2013 of a genuine system with the same characteristics as proposed by Dullien [2013] (i.e. a 50% replacement rate (RR) for 12 months max., without capping), and calculate a stabilisation coefficient based on the change of disposable income for the unemployed. Their results suggest that the scheme would have a significant intertemporal and interregional stabilizing effects without permanent transfers in the long run. Beblavỳ and Maselli [2014] find that countries such as Belgium, Germany, Austria, Luxembourg would have benefited from EMU-UI during the 2000s and Greece, Spain and Portugal would have benefited in the aftermath of the financial crisis of 2008. At the macroeconomic level, Enderlein and Spiess [2013] investigates the stabilizing power of a cyclical shock absorber for the EMU and find that the budget would not lead to perma-

nent transfers and that all countries would benefit from and contribute to the fund. Moyen et al. [2019] evaluate the optimality of a common unemployment insurance in a two-country model in terms of the level of transfers that stabilise consumption in peripheral Eurozone countries and find that the optimal replacement rate would have a high counter-cyclical effect overall. Concerning the income protection role of EMU-UI, Jara and Sutherland [2014] and Jara et al. [2016] conducted simulations of a genuine EMU-wide unemployment insurance using EUROMOD to estimate potential income protection effects for individuals. They compare the economic situation of unemployed individuals under national systems and under the considered EMU-UI (50% wage-replacement payments for 12 months, with maximum and minimum levels) and find that the introduction of such a scheme would increase coverage rates and thereby increase household income stability and reduce the risk of poverty. Our work complements this strands of the literature by focusing on the implications of an EMU-UI across different types of workers. More precisely, we examine the effects of an EMU-UI for the specific case of non-standard workers, who we compare separately to all workers and to workers with the highest risk of job loss. This sheds light on the potential performance of such a system for the most vulnerable workers in the event of an economic shocks. We also complement the literature on the EMU-UI by assessing an alternative design where the self-employed would be entitled to the common scheme. The second strand of literature, to which this work is related, is that of non-standard or atypical workers and more specifically their risk of poverty and access to social security. Previous research has shown that both part-time and temporary employment are associated with a higher risk of poverty in Europe [Van Lancker, 2013, Horemans, 2018]. This type of workers tends to face the so-called 'double penalty' as they tends to work less and have lower hourly wages, usually called a 'wage penalty'. Although the theoretical literature suggests that temporary jobs might benefit from wage compensation for the lack of employment security, empirical evidence tends to show that temporary contract workers suffer from a wage penalty after controlling for job characteristics (see Booth et al. [2002], Blanchard and Landier [2002] among others). This type of workers tends to have more limited access to social security, especially in the case of the self-employed. Matsaganis et al. [2016] and Jara Tamayo and Tumino [2021] highlighted the strong gap in terms of access to unemployment benefits between standard and non-standard workers. As Jara Tamayo and Tumino [2021]), we also use microsimulation techniques to assess entitlement of non-standard workers to national unemployment benefits. However, our study refines the defini-

tion of non-standard workers by providing separate analysis for part-time workers, temporary contract workers or the self-employed. We further assess the additional income protection provided by the EMU-UI to this category of workers.

2.3 The architecture of an EMU-wide unemployment insurance

As mentioned above, different designs for the EMU-UI have been proposed and analyzed in the literature. They vary mainly in terms of their duration, typically from the 3rd month of unemployment to the 12th month of unemployment, as this corresponds to short-term unemployment, the most cyclical kind. They do not cover frictional unemployment, considered here as the first three months, and long-term unemployment (from the 12th month onward). Note that passing from a national to a supranational scheme in the third month of unemployment may be administratively complex and it may be easier to have supranational coverage right from the first month of unemployment, as suggested by Beblavý and Lenaerts [2017]. Regarding the level of benefits, the most common proposal is a replacement rate of 50% of previous gross wages as this has been shown to be a sufficient level of support without setting an unemployment trap [Krueger and Mueller, 2010]. Capping at at 150% of national average earnings has been considered by Beblavý and Lenaerts [2017] among others. Jara et al. [2016] also considered a floor at 30% of average earnings. Delpla (2012) proposed a cap of 2000 euros per months in all countries. For eligibility, the rule is commonly 3 months of contributions over the past 12 months. This would presumably have important implications for the coverage rates of the benefit scheme. Based notably on the proposals of Beblavý and Lenaerts [2017], we introduce an EMU-UI with the following characteristics: coverage from the 1st to the 12th month of unemployment, a common replacement rate of 50% of previous earnings, and an eligibility requirement of at least 3 months of contributions in the last 12. Unemployment benefits are accessible for all employed individuals younger than 64 years old. We also consider an alternative scenario in which the EMU-UI also covers the self-employed. This alternative should have a strong effect on generosity levels as the self-employed are currently not covered in many countries. The EMU-UI considered here is topped-up by national systems to avoid any decrease in benefits after implementation. The system is thereby designed to ensure workers in all countries benefit, with national systems providing any top-ups required where

existing schemes are more generous. EMU benefits are otherwise treated in the same way as existing unemployment benefits in national tax-benefit systems. Here, we do not consider the potential mechanisms to finance this benefit but we provide an assessment of the budgetary cost related to it.

2.4 Data and methodology

2.4.1 The European tax-benefit model EUROMOD

To analyse the entitlement and income protection effects of the European unemployment benefit scheme, we run counterfactual simulations using EUROMOD[1]. EUROMOD is the European tax-benefit microsimulation model based on EU-SILC data (European Union Statistics on Income and Living Conditions) from Eurostat. This tax-benefit model allows fiscal and social policies in place in all European countries to be simulated by calculating welfare entitlements and tax liabilities for each individual in each household. Based on nationally representative micro data, EUROMOD can be used to perform distributional analysis and assess the budgetary and work incentive effects of policy reforms. The underlying micro-data used for the simulations in this study come from EU-SILC 2016. Our simulations are based on the 2018 tax-benefit rules of European countries. Market incomes and non-simulated tax-benefit instruments in the data are adjusted to 2018 levels using source-specific updating factors.

Our analysis is static, in the sense that behavioural responses are not considered, for example, individuals' supply of labour, which may be affected by the reform. We assume full compliance with national policies and the EMU-UI and do not consider tax evasion or benefit non take-up.

2.4.2 Definition of atypical workers

We use the European Commission's (2016) definition of atypical work, namely self-employment and employment on uncommon types of contract including part-time

[1]The results presented here are based on EUROMOD version I1.0+. Originally maintained, developed and managed by the Institute for Social and Economic Research (ISER), since 2021 EUROMOD is maintained, developed and managed by the Joint Research Centre (JRC) of the European Commission, in collaboration with EUROSTAT and national teams from the EU countries. We are indebted to the many people who have contributed to the development of EUROMOD. The results and their interpretation are the authors' responsibility.

work, temporary work, fixed-term work, and seasonal work. The definition of what constitutes atypical work is a matter of debate as the share of non-standard employment in total employment has significantly increased, and new forms of work have been observed over the past years. In previous studies, notably by Jara and Tumino (2018), atypical workers are defined in terms of work intensity as (i) employees with low work intensity or (ii) the self-employed. Work intensity is computed based on the number of months and hours worked during a reference year. However, this definition is potentially restrictive as the type of contract is not taken into account. We extent this analysis in ours by using a more precise definition of atypical workers.
We use information on contract types from the EU-SILC database on which EUROMOD data are based. We separately analyze three groups of workers (i) All workers (ii) temporary contract workers, (iii) individuals on part-time contracts (based on hours worked per week) in line with the EU Commission's definition of atypical workers, rather than using a proxy for work intensity as in Jara and Tumino (2018).
In this paper, we investigate effects that introducing an EMU-UI would have on income protection for all workers, including atypical workers, by grouping them precisely in terms of the characteristics that make them vulnerable (i.e. part-time and temporary contract work).
The prevalence of atypical workers according to this definition is fairly heterogeneous across the EMU, in line with Jara Tamayo and Tumino [2021]. As shown in Figure 2.1, the share of part-time workers ranges from less than 10% of the working population in Slovenia and Slovakia to more than 30% in Ireland, Italy and the Netherlands. On average, 21% of the working population in the EMU works less than 35 hours per week. The prevalence of temporary contract workers is less variable as they represent less than 10% of the working population in most countries. The share of temporary contract workers is nevertheless more than 10% of the working population in France and Spain.. The share of the self-employed in the working population is more heterogeneous across the EMU,ranging from around 6% in Luxembourg to more than 30% in Greece.

Figure 2.1: Prevalence of atypical workers in percentage of working population

Note: Countries ranked by the share of part-time workers. Official country acronyms used. Source: Authors' elaboration using EUROMOD I1.0+ data.

2.4.3 Simulating transitions from work to unemployment

In order to assess the potential income protection provided by the EMU-UI, we move people from work to unemployment in the data [Figari et al., 2011, Salgado et al., 2014, Jara and Sutherland, 2014] and analyse UI effects for these "newly unemployed" individuals. This allows us to compare disposable incomes in work and unemployment both with and without the EMU-UI. Simulating unemployment benefits for currently employed workers is extremely useful to understand how the UI system protects workers from income loss in case of unemployment. Information such as previous contributions or earnings are needed to simulate entitlements to UI and levels of benefits. This information is usually not available for the unemployed in survey data, as information on their work history is typically lacking. However, this information can be proxied by month in employment for individuals in work, when they are moved to unemployment.

Transitions from work to unemployment in our analysis are simulated as follows (see Jara Tamayo and Tumino [2021] for more details). Disposable income is first calculated before the transition. Then, for each earner in the household, individual earnings are set to zero and all benefits they would be eligible for (including EMU-UI) are simulated using EUROMOD, along with the corresponding household disposable income. This is done separately for each earner in the household, under the assumption that other household members' behaviour is not affected by the individual's entry to unemployment and loss of income. Unemployment transitions are simulated for each earner in the household separately and the corresponding household disposable income in unemployment is calculated.

An important piece of information needed to calculate unemployment benefits is the length of unemployment periods. Previous studies (Jara and Sutherland [2014], Jara Tamayo and Tumino [2021]) simply assumed that the number of months in unemployment was equal to the number of months worked during the reference year preceding the simulated transition. This assumption seems restrictive and questionable. It seems unlikely indeed that individuals who have worked for longer in the preceding year should remain unemployed for longer than those who have worked less. In terms of capturing the effects of EMU-UI on very short-term unemployment (1-2 months of unemployment) furthermore, these individuals would never be covered under this assumption because of eligibility requirements (at least 3 months of work).

We improve on this approach in our simulation of transitions to unemployment by

explicitly estimating the length of unemployment spells. More precisely, we regress the number of months of unemployment for the currently unemployed as a function of their socio-demographic characteristics using zero-truncated binomial regression. The number of months in unemployment can be considered count data, so can be estimated using Poisson or Negative binomial regression. Poisson regression is appropriate when the mean of the data is equal to its variance; however, there is evidence of over-dispersion in ours. Negative binomial regression was therefore chosen as this condition need not be satisfied. Both Poisson and negative binomial regression are used for data with zero values, whereas we want to compute the number of months of unemployment for the currently unemployed, i.e. without zero values. The most appropriate approach in this case is the zero truncated negative binomial (ZTNB) regression. We estimated the number of months of unemployment based on demographic characteristics: gender, age, number of years of education, previous work history, previous earnings, and type of occupation.
The conditional probability of being unemployed in the ZTNB model is:

$$Pr(y_i|y_i < 0, x_i) = \frac{Pr(y_i|x_i)}{1 - (1 + \alpha\mu_i)^{-1/\alpha}} \tag{2.1}$$

The expectation of the zero-truncated negative binomial distribution is:

$$E(y_i|y_i > 0) = \frac{\mu_i}{1 - (1 + +\alpha\mu_i)^{-1/\alpha}} \tag{2.2}$$

with μ_i being the expected count (i.e. the estimated number of months of unemployment), y_i, the length of the ith observed unemployment period, and α the dispersion parameter.
The linear regression equation is then:

$$log(\mu_i) = \beta_0 + \beta_1 X_{1i} + ... + \beta_k X_{ki} \tag{2.3}$$

with β_k the coefficient associated with the kth predictor variable (see below) for the ith observation. The estimated coefficients are listed in Table 2.8. The model shows a weak but highly significant association between age and unemployment time. The duration of unemployment is also associated with the industrial sector. The reference industry is agriculture and forestry and unemployment duration is significantly shorter in nearly all other industries, notably in retail, transport and real estate. Education level seems to have a limiting effect on unemployment spells in most countries, but this association is relatively weak. The association with work history

is also negative, meaning that the more an individual has worked, the shorter their unemployment spell is expected to be should they loose their job. This confirms the value of estimating the length of unemployment periods rather than using worked months in the preceding year as in Jara Tamayo and Tumino [2021]. This approach allows us to predict a duration of unemployment for all currently employed individuals after their transition from work to unemployment. This improvement also allows us to analyze effect of the EMU-UI on the short-term unemployed.

Table 2.7 in the appendix shows the estimated unemployment duration as a function of demographic and labour market characteristics in each country. In most countries, workers with more months worked have on average shorter predicted unemployment periods than low intensity workers do. Unemployment duration is typically longer in most countries for younger individuals (<30) and those with lower levels of education (primary and lower secondary). Work duration is similar across the EMU (11.66 months per year on average) , whereas unemployment duration are more variable.

2.4.4 Workers with the highest risk of unemployment

As mentioned in the previous section, we focus on all atypical workers, make them unemployed and assign them an estimated unemployment duration. These workers may have different characteristics from the currently unemployed. In order to also understand the effect of EMU-UI on a population similar to the currently short-term unemployed we select individuals with the highest risk of losing their jobs). We select 3% of individuals, corresponding roughly to the average share of short-term unemployed under a large economic shock in the EU, to increase sample size[2]. This might realistically corresponds to a shock in the Eurozone, considering that the employment rate in Europe decreased by 2.5% from the first quarter of 2008 to the end of 2010 as a result of the subprime and sovereign debt crises. The decrease in employment from 2007 to 2011 was greater than 3% in eight Eurozone countries and up to 15% in Estonia [Anderton, 2012].

In order to select this worker group, we estimate the probability of becoming unemployed for current workers in each country according to individual and job characteristics We estimate the probability of becoming unemployed for current workers in each country. We use a logit model with a dummy dependent variable equal to 1 if an individual was unemployed for at least 1 month in the year and 0 otherwise,

[2]Selecting 2% of workers yielded too small samples in some countries

and individual characteristics as predictors, namely gender, age, work history, years of education, and occupation.
In the logistic regression model, the probability of being unemployed is:

$$Pr(y = 1) = F(x_i\beta) \tag{2.4}$$

Which can be rewritten in the common form:

$$Pr(y = 1) = \frac{e^{\beta x_i}}{1 + e^{\beta x_i}} \tag{2.5}$$

The estimated coefficients are listed in Table 2.8. Men are more likely to be unemployed than women, but the association with gender is relatively weak. Education level, measured here by the number of years of education, seems to be the most consistent predictor, and is negatively associated with the probability of facing unemployment. There is a strong negative relationship between work history (i.e. the total number of months in the reference year) and the probability of becoming unemployed (except for Greece, Luxembourg and the Netherlands). The association with the sector of employment is also significant, with unemployment more likely for construction, health and social work workers. The association between age and the risk of being unemployed is very weak.

We predict the probability of becoming unemployed for all workers before for each country, and select the 3% with the highest probability. The characteristics of these high-risk workers are listed in Table 2.4. The share of part-time and low-skilled workers is higher than in the overall working population.

2.5 The effects of EMU-UI

For our results, we focus on three main variables: (i) Potential coverage, (ii) Net replacement rates (NRR), (iii) Risk of poverty. The analysis is conducted for the working population as a whole, individuals working less than 35 hours per week (part-time work), temporary contract workers, and the 3% of workers with the highest risk of becoming unemployed. This allows us to investigate the potential impact of the EMU-UI scheme for different segments of the working population.

2.5.1 Potential coverage

One important indicator of UI systems is their coverage rate. Potential coverage measures the percentage of workers who would be covered by unemployment insurance schemes in the event of unemployment. This typically depends on work history-related eligibility conditions (number of months of work in the preceding year).

We consider the potential coverage of the entire workforce, as opposed to actual coverage, which is based on unemployed individuals currently receiving benefits. Note that the potential coverage rates calculated here differ from UI coverage statistics. Standard statistics often include the long-term unemployed whereas in our case we focus only on the short-term unemployed (less than 1 year of unemployment). The non take-up of benefits is also not taken into account in our analysis and the current workers considered may not be representative of actual unemployed individuals.

We present the results separately for the working population as a whole, part-time workers, temporary contract workers and the 3% of workers with the highest risk of unemployment. Figure 2.2 shows the potential coverage rates of national UI systems by worker type as well as the additional coverage that would result from the introduction of an EMU-UI. The underlying data can be found in Appendix Table 2.8.

Our analysis shows that that the coverage rates of national UI systems vary considerably between countries, which is consistent with national coverage rate statistics and with previous findings (Jara et al., 2016). Part-time workers and temporary contract workers have lower than average coverage rates in general, and there is more variability between countries. This is consistent with the fact that these workers tend to have shorter contribution histories and do not always meet the eligibility criteria of national systems.

Averaging over all workers, the potential coverage rates of national UI range from 43.29% for Malta to 93.42% for Luxembourg, with rates in most countries around 65-80%. According to these results, introducing EMU-UI would increase potential coverage in all countries (i.e. it would allow a larger proportion of workers to access unemployment benefits as the eligibility conditions are less restrictive than in all countries). The additional coverage is limited however, except in Malta where coverage would increase by 40.24 percentage points, and to a lesser extent in Lithuania, Estonia and Slovakia, countries that all have stringent eligibility conditions for national UI. In Estonia for example, the necessary contribution period is 1 year in the last 3, and in Slovakia, 24 months' contribution in the last 48 are required. The

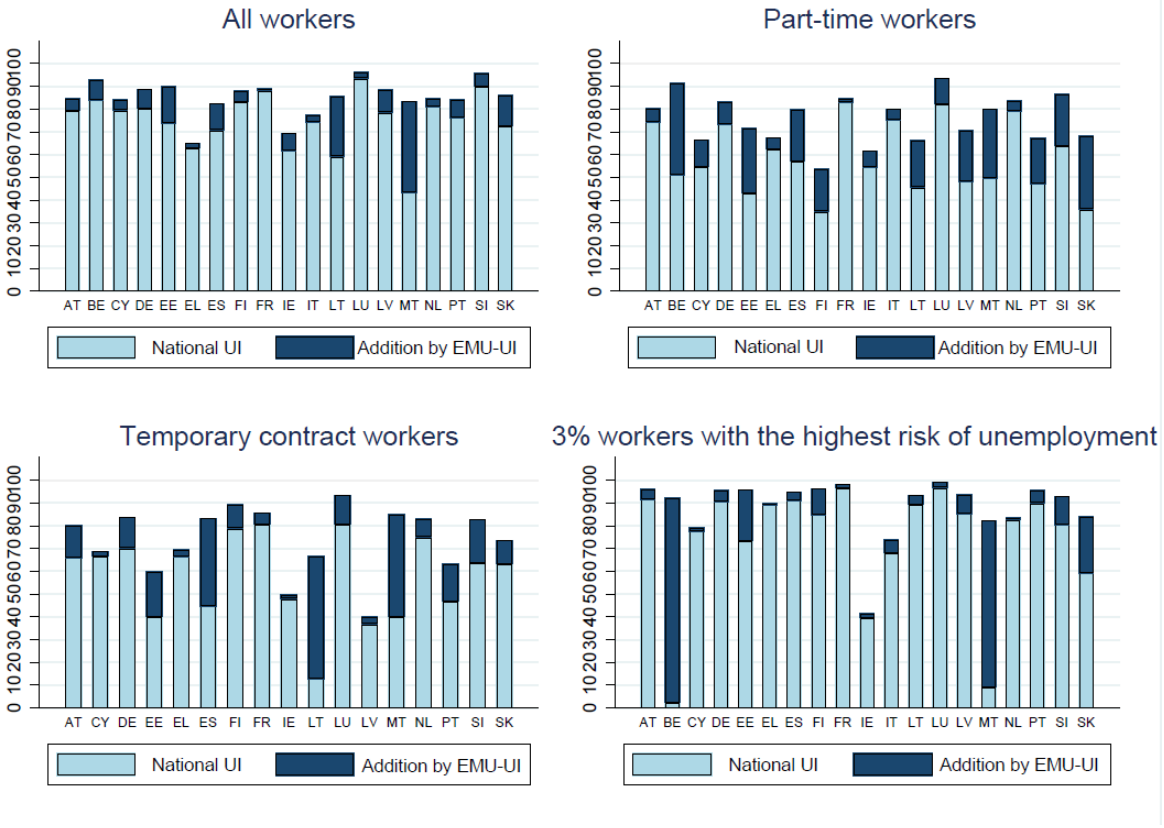
modest increase in coverage under EMU-UI in countries such as Greece, Italy, Luxembourg and France is explained by the less stringent eligibility conditions of their national UI schemes. In these countries, workers only need to have worked between 4 and 6 months in the preceding year to be eligible to UI.

Part-time workers, who typically have lower work intensity, have lower potential coverage rate in comparison to all workers. The potential coverage of part-time workers is lower than average under the current systems in most countries. In Slovakia, Portugal, Malta, Latvia, Lithuania and Estonia, less than 50% of part-time workers would have access to unemployment benefits were they to lose their jobs. The introduction of an EMU-UI would increase the potential coverage rate for these workers more than it would overall, with increases ranging from 1.91 percentage points in France (which already has high potential coverage as the national system is relatively generous) to 32.25 percentage points for Slovakia. Under the the considered EMU-UI, the potential coverage of part-time workers would be above 65% in all EMU countries.

Very few individuals were reported as temporary contract workers in our database so the sample sizes for this category of workers are small (or for Italy, zero). Potential coverage under national systems for these workers is much lower than it is for workers in general. The proportion of individuals on temporary contracts potentially covered by national systems in case of unemployment is only greater than 60% in eight countries. The introduction of EMU-UI would lead to a larger increase in potential coverage rates for these workers than in general, up to around 75-85% in most countries. Once again, the gain in coverage under EMU-UI would be relatively less substantial in countries with looser UI eligibility criteria such as France, Luxembourg and Cyprus.

For the 3% of workers at greatest risk of becoming unemployed, the coverage rate of national UI systems is lower than the average for all workers in some countries (Belgium Ireland, Malta and to a lesser extent, Italy and Slovakia), but close to average in others, which suggests that this part of the population seems to be representative of all workers. The increase in potential coverage under the considered EMU-UI would be particularly high for Belgium, Estonia, Malta and Slovakia, and coverage rates would be above 80% in most countries after the reform. In other countries such as Austria, Germany, Greece and Portugal, where coverage rates for these workers are already high, the EMU-UI would increase coverage less than for other groups of workers. Note that since sample sizes were small for this worker cat-

Figure 2.2: Potential coverage rate by worker type



Source: Authors' elaboration using EUROMOD I1.0+ data.
Note: Countries ranked by the share of part-time workers. Official country acronyms used.

egory in some countries (Cyprus, Latvia, Ireland, and Belgium) these results should be interpreted with caution.

2.5.2 Net replacement rates

The net replacement rate (NRR) is an indicator of income protection that measures the proportion of income maintained by social benefits in the event of unemployment. NRR is also a measure of the incentives for unemployed individuals to re-enter the labour market. It is defined as household disposable income in unemployment, Y^{U_i}, divided by the disposable income in employment, Y^{W_i}:

$$NRR_i = \frac{Y^{U_i}}{Y^{W_i}}$$

NRRs are calculated for each earner in the household separately, assuming that household members do not change behaviour when another member of the household becomes unemployed.

Intuitively, NRRs should range from 0 and 100% but specific tax and benefit instruments can push NRRs above 100% as unemployment benefits can exceed disposable income in work, especially for low earners and atypical workers. In our paper, if NRR is negative, we exclude the first percentile of the sample and if NRR is higher than 150%, we exclude the top percentile of the sample, in order to avoid that 'outliers' bias the results, especially for small sample groups.

Figure 2.3 shows the NRRs for all worker types under national UI systems along with the increases the considered EMU-UI would induce (see Table 2.9 for more details).

Averaged over all workers, national NRRs range from 58.95% in Malta to 77.43% in Luxembourg, and are about 60–70% in most countries. Introducing the EMU-UI would increase NRRs by a small amount in all countries. The increases would be larger in Spain, Italy and Slovakia, possibly because replacement rates are currently quite low in Slovakia and the unemployed are only covered for 6 months with tapered benefits in Spain and Italy.

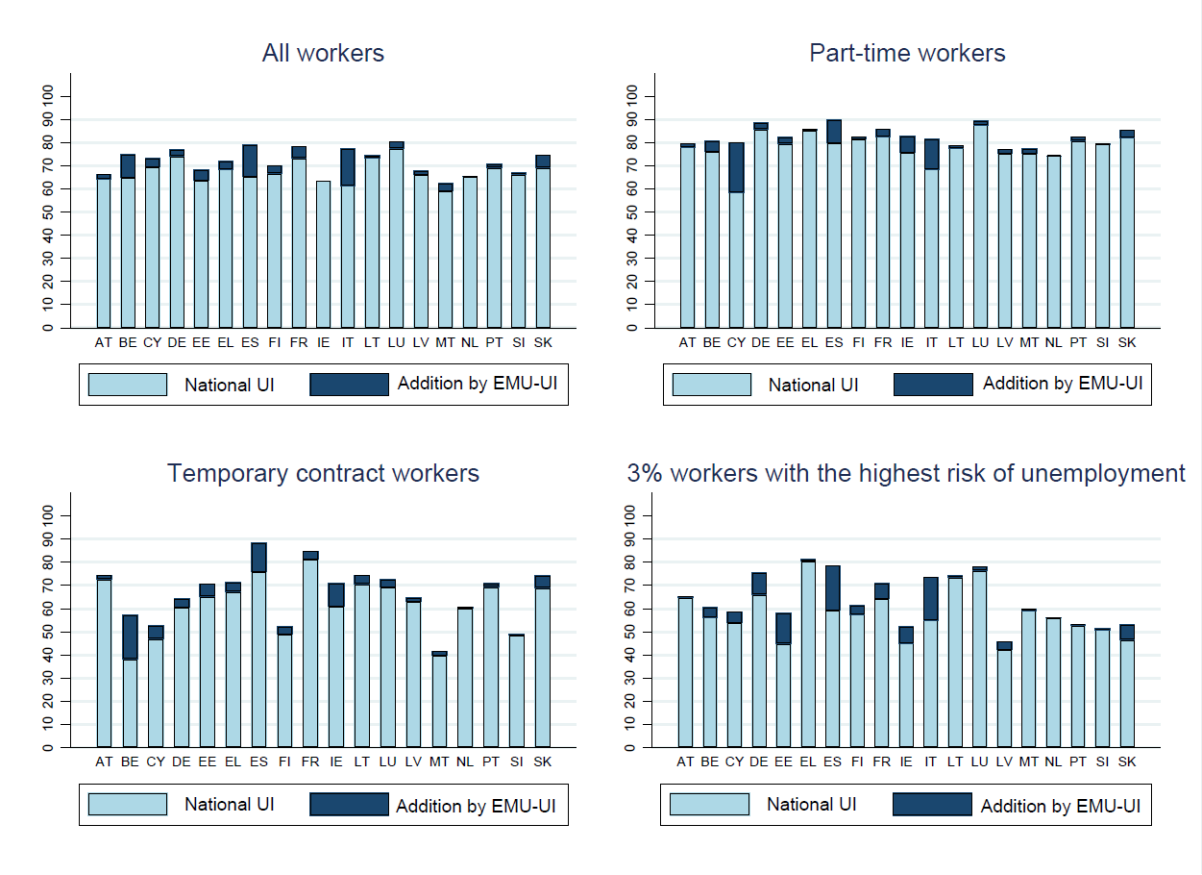
NRRs for part-time workers are much higher than for other types and EMU-UI would only lead to marginal increases. Although counterintuitive, this may be explained by the fact that the income lost when part-time workers are made redundant represents just a small fraction of household disposable income. This is in line with Jara and Tumino (2018) who show that household members' income is a determining factor in the NRRs of these low-intensity workers.

For workers on temporary contracts, Figure 2.3 shows that NRRs are lower than average, with values ranging from 36.81% in Latvia to 69.18% in Luxembourg. Introducing the EMU-UI would increase NRRs for these workers in all countries, and lead to large increases in Spain, Ireland and Italy. The considered EMU-UI would therefore have a significant effect on this segment of the population, who are less likely to be eligible for UI and have more limited access to other forms of benefits than other groups of workers.

For the 3% of workers at greatest risk of becoming unemployed, we find that NRRs vary across the EMU but are in general lower than for other types of workers, with

values under 60% in many countries. At baseline, under national systems, NRRs are only above 70% in Greece, Lithuania and Luxembourg. Under the considered EMU-UI scheme, NRRs for these workers would be increased by more than 10 percentage points in Italy, Spain and Estonia, but would remain below 60% in many countries and change little at all in Malta, the Netherlands, Portugal, Slovenia and Austria.

Figure 2.3: Net replacement rates by type of workers



Source: Authors' elaboration using EUROMOD I1.0+ data.
Note: Countries ranked by the share of part-time workers. Official country acronyms used.

2.5.3 Risk of poverty

In this section, we evaluate the role of the EMU-UI in protecting individuals from unemployment-related poverty. As becoming unemployed increases the risk of poverty, we analyze the risk of poverty for atypical workers before and after becoming unem-

ployed. Poverty is defined here as disposable income less than 60% of the median equivalised disposable income in the baseline scenario (before entering unemployment). We calculate the share of all workers, part-time workers and temporary contract workers who would fall into poverty on becoming unemployed under national and EMU-UI systems.

Figure 2.4 shows, for both types of workers, the proportion of individuals in poverty while still in work, the proportion of individuals who would fall into poverty on loosing their jobs even with EMU-UI, and the share of individuals protected from poverty by the EMU-UI system.

The proportion of workers in poverty is around 8-10% in most countries, lower than 6% in France, Luxembourg, Ireland and Slovakia, and closer to 20% in Spain, Italy and Germany. Values range from 3.91% in Ireland to 16.35% in Spain. The introduction of EMU-UI would on average protect around 3% of workers from poverty in the event of unemployment. In Italy, where under national UI, the proportion of workers at risk of poverty on becoming unemployed is particularly high (around 35), the EMU-UI would reduce the unemployment-related poverty rate by 22 percentage points.

Part-time workers are more likely to experience in-work poverty, particularly in Spain, Germany, Portugal and Slovenia, so the share at risk of entering poverty on becoming unemployed is lower than for workers in general. Their contribution to the household's disposable income is relatively small, so the job loss has little impact on household income. The average rate of in-work poverty for part-time workers across the EMU is about 18% and around 13% are at risk of poverty on becoming unemployed. The considered EMU-UI scheme would protect significant proportions of part-time workers from unemployment-induced poverty, particularly in Austria and Italy. In Austria, this is probably because replacement rates are less generous than in other EMU countries (55% of net previous income) and eligibility conditions stricter.

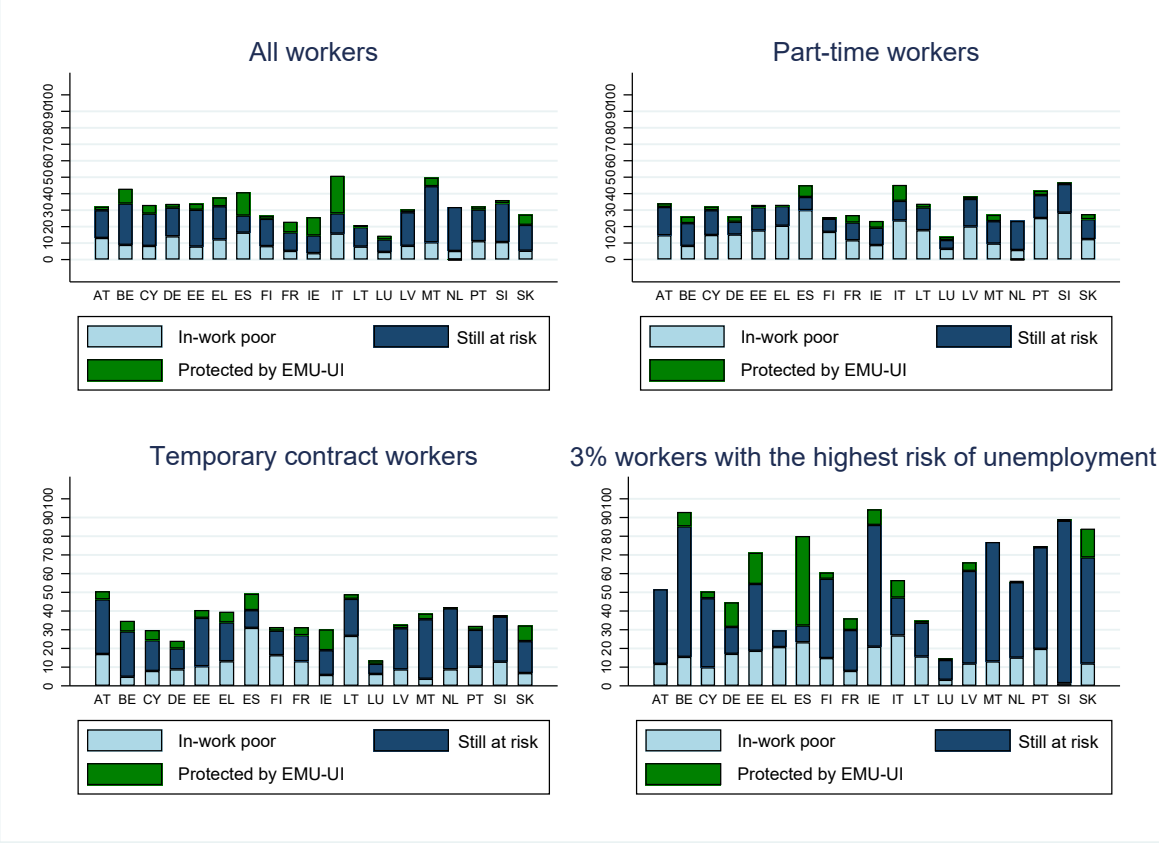
The share of temporary contract workers at risk of poverty on becoming unemployed is high, in part because it is difficult for these workers to access UI systems, and the additional protection offered by the EMU-UI scheme is generally low. In Spain, Ireland and Slovakia however, countries with strict UI eligibility conditions, we find that EMU-UI would protect a considerable share of temporary workers.

For the last subgroup, the 3% of workers at greatest risk of unemployment, the proportion of individuals at risk of poverty is particularly high in comparison with

other categories of workers, especially in Belgium, Ireland, Slovenia, Malta and Portugal. The rate of in-work poverty is 10-20% for most countries, except for Italy (above 20%) and Cyprus, France, Luxembourg and Slovenia (below 10%). While the EMU-UI would reduce the share of these workers at risk of unemployment-related poverty in some countries, notably Spain, Estonia and Italy, it would have no such effect in many others, even in those such as Malta, Slovenia, Portugal and the Netherlands where the proportion of at-risk individuals is high.

In summary, the overall effect of the considered EMU-UI scheme with respect to poverty would be to slightly increase protection for all workers, including part time workers, but to a lesser extent in countries such as France, Luxembourg, and the Netherlands, where poverty rates are low and existing unemployment benefit systems generous. See Table 2.10 for more details.

Figure 2.4: Poverty rates by type of workers



Source: Authors' elaboration using EUROMOD I1.0+ data.
Note: Countries ranked by the share of part-time workers. Official country acronyms used.

2.6 An alternative scenario: EMU-UI accessible to the self-employed

2.6.1 Income protection for the self-employed

Results for the self-employed have so far not been presented because the considered EMU-UI would have no effect on this group, as they are not entitled to the benefits (for more details on existing proposals, see Beblavý and Lenaerts [2017] who present 18 alternative EMU-UI schemes, none of which consider coverage for the self-employed). However, self-employment rates are increasing and are already high in some countries (see part 4.2). This group of atypical workers also has poor access to social protection, notably to unemployment insurance systems. In some EMU countries such as Finland, Luxembourg, Slovenia and Slovakia, the self-employed are eligible to unemployment insurance under similar conditions as employees and this is also possible for certain categories of the self-employed in Ireland, Lithuania and Portugal. In Spain, Austria, and Germany, they can choose to participate in the UI system [3]. Jara Tamayo and Tumino [2021] show that NRRs for the self-employed vary widely, and that they have higher rates of in-work poverty and less protection against poverty in the event of unemployment than other types of workers.

Given the low income protection of the self-employed, it seems relevant to consider alternative EMU-UI schemes better adapted to this form of work.

Here, we consider an EMU-UI system with the exact same characteristics as above but now with coverage for the self-employed. The eligibility conditions are the same, i.e. 3 months of (self-employed) work in the past 12, with a replacement rate of 50% of previous average monthly (self-employment) income. Figure 2.5 shows what effects opening the EMU-UI to the self-employed would have on potential coverage rates, NRRs, and the risk of poverty.

Regarding potential coverage rates, the self-employed are currently not covered at all in most countries, and introducing the proposed EMU-UI scheme would increase coverage rates to around 90%, except in Ireland where it would be under 80%. In Finland, Luxembourg and Slovenia, where the self-employed are already eligible to unemployment benefits under similar conditions as employees, coverage rates are

[3]Information on the accessibility of national UI systems for the self-employed was collected from Jara and Tumino (2020), the Mutual Information System on Social Protection database (MISSOC: https://www.missoc.org/) and the Euromod country reports (https://www.euromod.ac.uk/using-euromod/country-reports).

already high and would not change[4].

NRRs for the self-employed vary from 51.65% in Lithuania to 82.69% for Luxembourg. In Estonia, Finland, Luxembourg, Slovenia and Slovakia, NRRs are already high (above 70%) without EMU-UI. In Greece, Spain and Italy however, introducing the EMU-UI for the self-employed, would substantially increase their NRRs. In the case of Greece indeed, even though the self-employed are covered in principle by UI, the strict eligibility conditions deny access in practice for most self-employed workers. In other countries, introducing this EMU-UI would also increase NRRs but to a lesser extent.

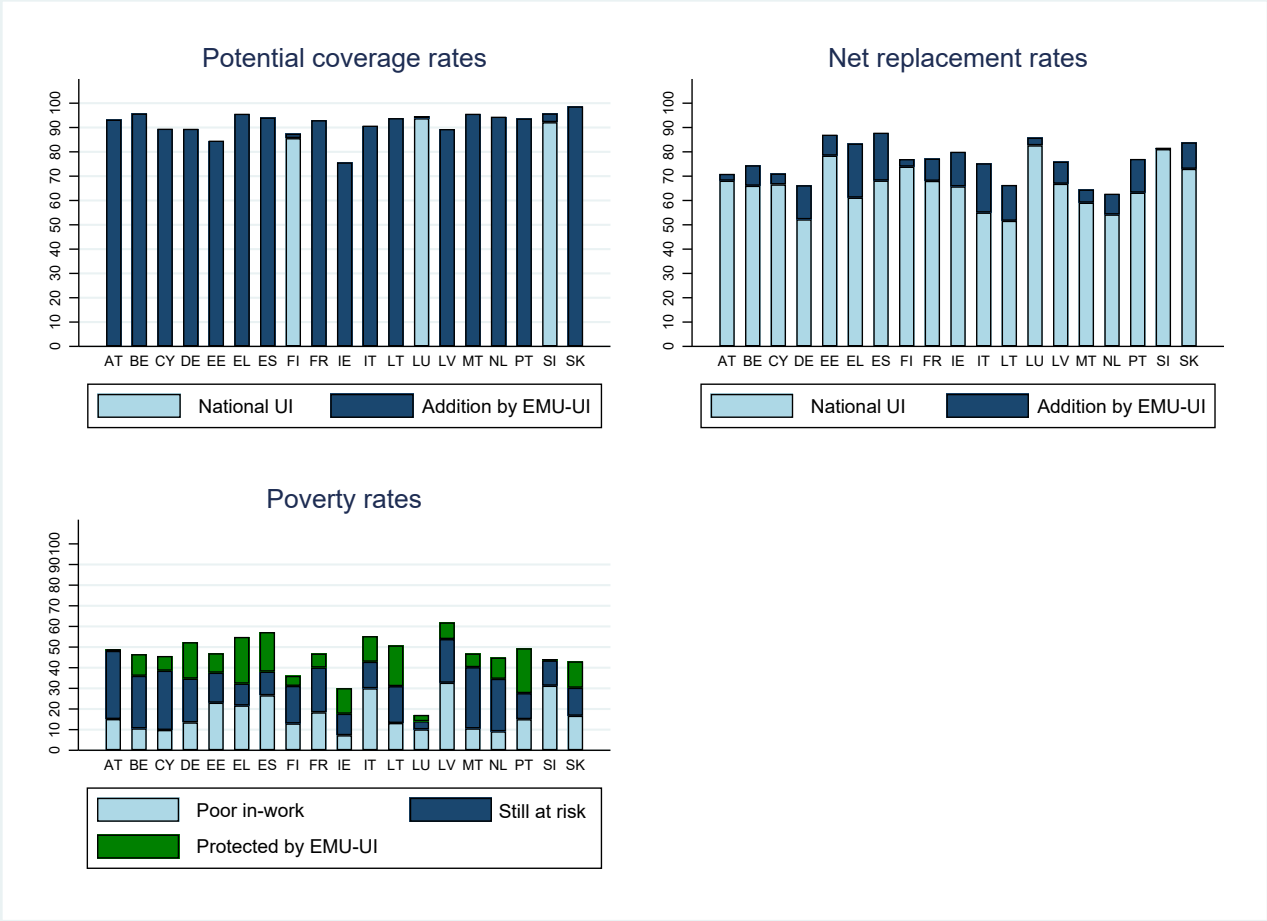
In-work poverty rates for the self-employed are relatively high, especially in Latvia, Slovenia, Italy and Spain, where more than 20% of the self-employed are poor. EMU-UI coverage would substantially reduce unemployment-related risk for the self-employed, especially in Germany, Greece, Spain, Lithuania and Portugal. The increases in the proportion of the self-employed protected from poverty would range from 0.57 percentage points in Austria to 22.63 percentage points in Greece. Note however that even with this type of EMU-UI, the share of the self-employed at risk of poverty in the event of unemployment would remain quite high, at 18.33% on average.

2.7 Budgetary costs

We now consider the budgetary implications of the EMU-UI schemes. Based on Jara Tamayo and Tumino [2021], we calculate the associated percentage increase in average net transfers (all benefits including unemployment benefits minus taxes) paid to workers (both employed and self-employed) in the event of unemployment. Figure 2.6 shows that the basic EMU-UI scheme would lead to an increase in average transfers of more than 60% in Austria, Belgium, Spain and Slovenia, and more than 100% in Ireland and Malta. In contrast, net transfers would change very little under EMU-UI in Cyprus, Germany, Greece, Lithuania, Luxembourg, Latvia, Netherlands and Portugal.

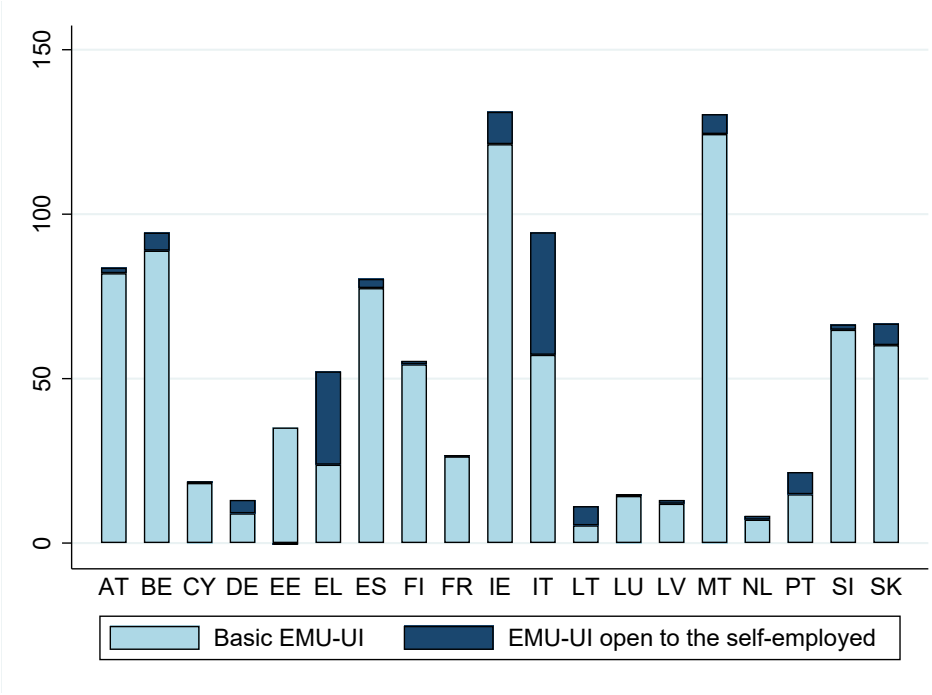
[4]In our analysis, national UI schemes are simulated for the self-employed only in those countries where this category is compulsorily covered by the general national UI scheme. The only exception is Greece, where the self-employed are compulsorily covered, but the stringent eligibility criteria cannot be simulated with the data. In countries where the self-employed can join national UI schemes voluntarily, we are unable to simulate their eligibility.

Figure 2.5: Effects of EMU-UI on income protection indicators: Self-employed



Source: Authors' elaboration using EUROMOD I1.0+ data.
Note: Countries ranked by the share of part-time workers. Official country acronyms used.

Figure 2.6: Change in average cost per unemployed worker in % between national UI and a basic EMU-UI and additional cost of EMU-UI open to the self-employed



Source: Authors' elaboration using EUROMOD I1.0+ data.
Note: Countries ranked by the share of part-time workers. Official country acronyms used.

Regarding the additional cost of opening EMU-UI to the self-employed (the dark blue bars in Figure 2.6), the increase in transfers would be low (under 5%) in a majority of countries (11/19). The increase would be much higher however in Italy (37%) and Greece (28%), probably because of the high rate of self-employment in these countries (28.85% in Greece and 20.11% in Italy).

2.8 Concluding discussion

This paper investigates the effects introducing an EMU-UI scheme would have on coverage rates, income replacement and poverty reduction in the EMU, with a focus on atypical workers. The EMU-UI scheme simulated in this paper is based on several proposals currently under discussion. The common standards and minimum requirement this implies for all countries reveals the gaps in current national UI sys-

tems and the need for more income support in some countries. The effects of this EMU-UI scheme are simulated for all individuals currently in work, as well as for individuals in part time work, on temporary contracts and for the 3% most at risk of unemployment. We also consider an alternative more inclusive scenario in which EMU-UI is also accessible for the self-employed.

Our analysis indicates that the prevalence of atypical workers and their access to benefits vary considerably between EMU countries. Our work also highlights the current heterogeneity of access to unemployment benefits in the EMU and in terms of the share of income preserved in case of unemployment. Our results show that the EMU-UI would increase coverage rates, especially for atypical workers, the most vulnerable in the labour market. The basic EMU-UI scheme considered would also provide a higher level of income protection in the case of unemployment. The increase in potential coverage and NRR varies between countries depending on how generous current national UI systems are. In Luxembourg, France and the Netherlands, the EMU-UI would only have a very small effect on levels of income protection while in Malta, Lithuania and Slovakia, the effects would be much larger, as national systems in the latter offer less protection. We found that the EMU-UI scheme would protect more workers from poverty in the event of unemployment, especially part-time workers. We find that the situation for the self-employed vary widely between countries but they are generally poor, with low access to UI systems and a greater risk of poverty than other types of workers. Opening EMU-UI to the self-employed would substantially increase NRRs, especially in Greece, Spain and Lithuania and would significantly reduce poverty rates among these workers.

The main goal of our work is to empirically assess current national unemployment benefit systems and current income protection specifically for atypical workers. Our analysis then outlines what effects a supranational EMU-wide benefit system would have. Since our results indicate that income protection would increase, EMU-UI, which is usually considered as a potential stabilisation tool, can be expected to perform well in this regard.

We have to keep in mind that this analysis was made for current workers, who may not be representative of the currently unemployed, and that the non-take up of benefits was not considered, possibly leading to the potential effects of the EMU-UI being overestimated. Nevertheless, our approach of selecting different types of workers and moving them to unemployment allows the performance of the EMU-UI in case of hypothetical shocks to be analysed. Our analysis is static, but the

dynamics of the system would be worth considering, notably the behavioural response of individuals. Economic issues are not consider either, and these would also be worth considering in future research.

This analysis could also be viewed in the context of the ongoing COVID-19 pandemic and ECB-forecasted unemployment rates for the Eurozone of 9.8% in 2020 and 10.1% in 2021. The economic crisis is expected to hit the most vulnerable share of the working population the hardest, in particular low-wage workers and those on short-term contracts. Women and younger workers are also expected to be disproportionately affected. Businesses that have been forced to close represent about 10% of employment, a share that varies between sectors and countries, with an overrepresentation of self-employed and temporary contract workers (22%, compared with about 11–15% in activities amenable to remote work) and an underrepresentation of workers on permanent contracts (just 56%)[5].

Countries have taken unprecedented measures during the COVID-19 pandemic to better protect non-standard workers. One of the main measures has been the short-time work (STW) scheme, which allows firms to reduce working hours with income support for employees from the State for the hours not worked. Similar alternatives include furlough schemes to support temporary reductions in working hours or temporary layoffs. Schemes such as these already existed in many Eurozone countries (12/19) and were extensively used, or where newly implemented in the context of the pandemic (e.g. in Slovenia).

Countries have also had to modify existing unemployment insurance systems to strengthen worker protection. The crisis has highlighted the necessity of access to income support in case of shocks for non-standard workers, who are both more likely to be affected by crises and less likely to have access to social protection. Countries have thus had to urgently modify the eligibility conditions for unemployment insurance to better cover non-standard workers. This has been the case in Germany, Spain, Italy and Finland for instance. Ten Eurozone countries have taken emergency measures to protect self-employed workers, either by opening access to UI systems to the self-employed, by relaxing eligibility conditions for self-employed UI schemes, or by creating an emergency support fund for the self-employed. Unemployment insurance payments have also been extended in eight countries or increased to ensure a minimal sustainable replacement rate. The fact that most Eurozone countries have had to modify the rules of existing UI systems to guarantee a certain level of income

[5]For more details, see Fana et al. [2020]

protection for atypical workers highlights the need to strengthen social protection measures for these more vulnerable workers.

The European Commission has also created a new instrument, temporary Support to mitigate Unemployment Risks in an Emergency (SURE), with up to 100 billion euros available in the form of loans. This fund is designed to help the most affected countries strengthen worker protection, notably via STW schemes, but also any other policy aiming to preserve employment and limit income loss. The European Commission's statement that 'this temporary instrument should be seen as an emergency operationalisation of a European Unemployment Re-insurance Scheme in the specific context of the COVID-19 crisis, without prejudice to the possible subsequent establishment of a permanent instrument under a different legal basis in the TFEU.', has rekindled the debate on a common unemployment benefit system for the Eurozone as a permanent tool to face future crises.

Possible avenues for future work include understanding how the EMU-UI would have operated during the current crisis to protect workers' income in comparison with the emergency policies that have actually been implemented.

Appendix

Table 2.1: Sample characteristics: All workers

	BE	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT	LU	MT	NL	AT	PT	SI	SK	FI
N	5301	11408	6779	4557	13514	13964	10513	17458	4401	5640	4426	4408	4289	13178	5703	10003	10712	7055	11644
Male	53.9	50.2	50.7	53.4	57.6	54.0	51.1	57.9	51.1	49.5	50.6	55.2	59.3	53.1	55.0	50.0	54.9	53.8	50.7
Female	46.1	49.8	49.3	46.6	42.4	46.0	48.9	42.1	48.9	50.5	49.4	44.8	40.7	46.9	45.0	50.0	45.1	46.2	49.4
Age <30	17.2	16.8	19.9	16.4	11.6	11.9	18.7	11.2	21.9	18.9	19.7	18.6	26.2	17.3	20.3	16.1	13.4	18.8	17.4
Age 30-50	58.6	51.9	51.8	58.4	65.2	63.8	57.2	59.8	56.2	52.3	50.5	63.8	52.4	53.5	54.6	60.0	65.0	57.9	52.3
Age >50	24.2	31.4	28.3	25.2	23.3	24.3	24.1	29.0	21.9	28.8	29.8	17.5	21.4	29.2	25.1	24.0	21.7	23.3	30.3
Low skilled	15.7	7.0	10.8	14.9	20.2	33.3	14.7	30.0	15.3	9.0	4.5	29.8	41.7	19.0	10.7	47.5	8.9	3.3	9.2
Medium skilled	36.2	54.1	47.1	29.7	42.8	24.1	44.8	46.3	43.1	54.9	54.3	39.6	29.7	40.0	54.6	26.9	57.5	72.0	45.6
High skilled	48.1	38.9	42.1	55.4	37.0	42.6	40.5	23.7	41.7	36.1	41.2	30.6	28.6	41.0	34.7	25.6	33.6	24.7	45.2
Employee	91.2	94.4	98.9	88.1	71.2	89.0	94.9	79.8	90.7	96.7	94.1	94.9	90.3	89.8	91.0	92.2	90.6	86.9	94.7
Self employed	8.8	5.6	1.1	11.9	28.8	11.0	5.1	20.1	9.3	3.3	5.9	5.1	9.7	10.2	9.0	7.8	9.4	13.1	5.3
Main earning	63.1	65.7	61.9	59.9	68.6	64.2	64.8	68.5	60.6	60.2	62.3	62.2	59.2	62.9	62.1	61.7	60.3	54.2	65.9
Second earning	36.9	34.3	38.1	40.1	31.4	35.8	35.2	31.5	39.4	39.8	37.7	37.8	40.8	37.1	37.9	38.3	39.7	45.8	34.1
Earning quintile 1	19.5	18.7	19.1	19.0	19.3	15.0	16.8	17.1	16.6	16.1	16.3	20.0	19.7	16.7	16.9	18.9	17.2	19.4	16.3
Earning quintile 2	20.0	20.3	20.1	20.3	20.7	20.1	20.4	19.4	20.6	20.8	20.9	19.9	20.0	20.7	20.7	20.4	20.6	19.2	20.9
Earning quintile 3	20.2	20.4	20.3	20.2	20.1	21.3	20.9	20.7	20.9	20.8	21.0	20.0	20.3	20.9	20.8	20.2	20.7	21.6	20.9
Earning quintile 4	20.2	20.4	20.3	20.2	20.2	21.7	20.9	21.4	20.9	21.3	21.0	20.0	19.9	20.9	20.8	20.3	20.7	19.3	21.0
Earning quintile 5	20.1	20.3	20.3	20.2	19.7	21.9	21.1	21.5	20.9	21.0	20.8	20.0	20.0	20.9	20.8	20.2	20.7	20.5	20.9
Part time	17.5	18.7	9.2	27.6	14.8	18.2	13.4	11.3	14.4	9.1	8.7	16.0	9.5	29.1	19.4	6.4	7.9	3.5	11.3

Table 2.2: Sample characteristics: Part-time workers

	BE	DE	EE	IE	EL	ES	FR	IT	CY	LV	LU	LT	MT	NL	AT	PT	SI	SK	FI
N	1 491	3 175	819	1 609	2 842	3 175	2 147	74	921	674	1000	559	708	6 146	1 569	1 000	1 013	340	2 028
Men	23.6	16.4	33.0	30.3	39.7	34.6	26.0	76.8	38.2	37.4	17.68	36.4	26.4	22.9	20.8	31.6	40.9	30.9	37.6
Women	76.4	83.6	67.0	69.7	60.3	65.4	74.0	23.2	61.8	62.6	82.33	63.6	73.6	77.1	79.2	68.4	59.1	69.1	62.4
Age <30	16.0	10.5	27.8	20.4	16.8	18.4	21.9	49.6	30.8	20.4	14.1	23.6	27.8	16.1	17.5	24.4	19.6	19.0	32.4
Age 30-50	55.1	54.5	41.4	51.3	61.5	60.4	50.4	50.4	46.0	44.8	63.1	38.7	49.9	52.5	58.6	51.0	55.5	55.4	39.0
Age >30	28.9	35.0	30.8	28.2	21.7	21.3	27.7	0.0	23.1	34.8	22.8	37.8	22.3	31.4	23.9	24.6	24.9	25.6	28.6
Low skilled	18.5	9.8	13.0	17.0	21.1	43.0	20.7	25.5	17.6	14.1	38.9	8.7	39.9	20.6	13.5	55.4	11.2	7.2	10.5
Medium skilled	38.6	62.0	49.5	35.9	40.4	23.9	48.3	74.5	38.6	59.4	41.1	55.2	33.3	42.6	59.3	23.2	65.9	71.6	54.0
High skilled	42.9	28.3	37.6	47.1	38.5	33.1	31.0	85.5	43.8	26.5	20.0	36.2	26.9	36.8	27.1	21.3	23.0	21.2	35.4
Employees	97.6	94.2	97.4	92.1	77.1	92.0	95.9	14.5	79.9	93.8	96.1	87.8	89.5	90.8	94.2	87.2	89.5	89.4	93.6
Self employed	2.4	5.8	2.6	7.9	22.9	8.0	4.1	99.1	20.1	6.2	3.9	12.2	10.5	9.2	5.8	12.8	10.5	10.6	6.4
Main earner	42.6	37.1	41.7	43.4	52.0	46.4	45.6	0.9	44.3	41.1	35.5	52.5	31.6	39.6	36.0	41.6	42.1	26.0	49.7
Second earner	57.4	62.9	58.3	56.6	48.0	53.6	54.4	23.0	55.7	58.9	64.5	47.5	68.4	60.4	64.0	58.4	57.9	74.0	50.3
Earning quintile 1	44.1	46.5	62.7	43.1	51.8	39.9	43.7	23.2	39.5	62.0	53.0	55.2	56.8	29.8	39.9	72.6	58.8	78.6	55.0
Earning quintile 2	24.9	33.0	18.8	28.6	23.2	36.2	30.8	37.4	30.9	21.7	17.2	14.4	18.0	31.0	34.7	13.1	30.4	11.9	28.3
Earning quintile 3	15.0	13.4	10.8	14.4	9.0	15.8	11.0	13.1	11.2	10.3	16.0	13.0	8.2	20.9	15.4	3.8	7.4	3.9	6.7
Earning quintile 4	11.7	5.1	3.8	8.1	9.9	4.2	9.3	3.3	5.9	3.9	10.2	12.1	14.2	11.9	6.2	5.7	2.4	3.7	5.4
Earning quintile 5	4.3	2.1	4.0	5.9	6.1	4.0	5.2	63.3	12.5	2.2	3.6	5.3	2.8	6.3	3.7	4.9	1.0	1.9	4.5

Table 2.3: Sample characteristics: Temporary contract workers

	BE	DE	EE	IE	EL	ES	FR	CY	LV	LT	LU	MT	NL	AT	PT	SI	SK	FI
N	215	687	126	169	856	3 264	1 323	180	140	136	106	118	310	346	785	507	304	587
Men	59.3	51.5	49.1	53.4	56.0	49.5	44.4	50.4	54.6	69.9	62.7	53.4	60.6	51.9	47.4	54.4	48.2	51.7
Women	40.7	48.5	50.9	46.6	44.0	50.5	55.6	49.6	45.4	30.1	37.3	46.6	39.4	48.1	52.6	45.6	51.8	48.3
Age <30	16.1	12.8	15.1	13.6	6.7	25.3	46.3	18.5	21.7	42.1	7.9	20.1	14.5	36.2	11.6	13.8	10.7	21.1
Age 30-50	57.8	54.0	58.5	63.2	68.1	62.0	42.0	62.4	51.7	39.0	61.1	55.6	55.5	44.2	63.6	70.2	62.5	50.6
Age >50	26.1	33.2	26.4	23.2	25.2	12.7	11.7	19.1	26.6	18.9	31.0	24.3	30.1	19.7	24.8	16.0	26.8	28.3
Low skilled	19.6	4.6	9.7	16.7	21.2	42.9	16.7	12.6	8.5	9.2	31.6	54.0	16.5	15.9	53.5	7.9	1.4	9.3
Medium skilled	35.2	55.9	51.3	27.0	40.1	22.6	52.5	40.9	63.9	68.4	51.8	22.3	40.0	43.2	22.6	58.7	68.8	47.2
High skilled	45.3	39.5	39.0	56.3	38.7	34.5	30.9	46.5	27.6	22.5	16.6	23.6	43.4	40.9	23.9	33.4	29.8	43.6
Employee	88.6	94.9	99.7	87.7	71.9	99.1	99.9	91.1	97.3	96.8	98.5	89.4	85.6	99.0	93.3	93.1	85.3	93.9
Self employed	11.4	5.1	0.3	12.3	28.1	0.9	0.1	8.9	2.7	3.2	1.5	10.6	14.4	1.0	6.7	6.9	14.7	6.1
Main earner	66.8	69.9	49.3	72.8	71.7	52.2	51.1	60.2	63.0	61.7	71.6	57.7	73.1	60.0	57.2	63.2	57.8	72.2
Second earner	33.2	30.1	50.7	27.2	28.3	47.8	48.9	39.8	37.0	38.3	28.4	42.3	26.9	40.0	42.8	36.8	42.2	27.8
Earning quint. 1	19.2	17.4	18.8	15.8	18.9	35.6	43.7	17.8	14.0	37.9	22.8	23.3	19.5	34.9	16.1	15.3	18.7	19.2
Earning quint. 2	17.1	20.6	22.7	18.8	21.3	30.9	32.9	20.4	24.9	21.8	20.9	21.3	16.3	25.6	22.2	20.1	18.0	19.0
Earning quint. 3	22.4	17.7	24.1	23.7	19.8	18.9	14.2	19.9	16.7	11.7	17.5	20.4	20.4	17.8	23.2	22.9	19.4	20.8
Earning quint. 4	22.4	23.6	15.1	25.4	18.0	10.8	6.3	21.2	22.4	14.4	19.2	16.2	23.2	10.1	21.9	22.8	22.9	20.0
Earning quintile 5	18.8	20.7	19.3	16.4	22.0	3.9	2.9	20.7	22.1	14.2	19.6	18.9	20.6	11.6	16.6	18.9	21.1	21.1
Part time	26.4	26.8	6.3	37.4	20.1	43.4	32.5	23.9	7.6	22.5	23.6	14.2	43.1	41.2	9.2	8.6	4.9	21.1

Table 2.4: Sample characteristics: 3% of workers at greatest risk of unemployment

	BE	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT	LU	MT	NL	AT	PT	SI	SK	FI
N	126	323	187	122	323	356	283	470	104	103	119	123	122	338	139	272	280	198	304
Male	70.91	51.38	62.05	58.93	45.36	59.36	48.11	58.35	57.77	63.36	57.43	80.97	74.86	67.66	54.11	58.01	37.89	65.59	37.00
Female	29.09	48.62	37.95	41.07	54.64	40.64	51.89	41.65	42.23	36.64	42.57	19.03	25.14	32.34	45.89	41.99	62.11	34.41	63.00
Age <30	53.55	27.26	59.00	30.29	46.04	28.43	59.13	58.06	60.65	35.02	41.80	28.76	52.45	23.11	34.76	58.19	58.11	56.30	46.79
Age 30-50	43.26	52.96	31.23	47.89	48.78	59.90	32.37	40.75	33.81	51.42	47.34	53.93	33.32	39.32	50.16	38.49	38.35	37.25	35.23
Age >50	3.19	19.77	9.77	21.82	5.18	11.68	8.50	1.18	5.54	13.56	10.85	17.31	14.23	37.57	15.08	3.32	3.54	6.45	17.98
Low skilled	37.79	15.21	31.20	16.00	31.97	81.27	22.06	61.77	10.97	34.57	6.95	62.01	59.41	34.57	26.43	50.63	15.63	13.69	12.02
Medium skilled	42.46	62.31	50.80	32.70	59.01	14.47	54.85	35.48	64.75	58.06	70.95	34.10	29.96	49.24	55.30	34.40	56.18	82.29	63.22
High skilled	19.76	22.49	18.00	51.30	9.02	4.26	23.09	2.75	24.28	7.37	22.10	3.89	10.63	16.19	18.26	14.97	28.19	4.02	24.76
Employee	94.67	95.37	99.42	84.62	93.46	98.61	99.77	71.84	92.85	99.16	99.32	95.05	90.06	86.53	98.17	97.87	89.58	78.70	98.97
Self-employed	5.33	4.63	0.58	15.38	6.54	1.39	0.23	14.59	7.15	0.84	0.68	4.95	9.94	13.47	1.83	2.13	10.42	21.30	1.03
Main earner	100.00	98.00	90.87	98.67	97.56	94.45	95.50	96.86	96.45	95.48	92.03	97.76	95.53	98.22	94.08	94.78	97.39	93.37	93.73
Second earner	0.00	2.00	9.13	1.33	2.44	5.55	4.50	3.14	3.55	4.52	7.97	2.24	4.47	1.78	5.92	5.22	2.61	6.63	6.27
Earning quint. 1	36.21	32.22	27.23	45.14	40.63	22.43	34.65	39.05	29.91	25.24	35.00	24.87	52.64	37.11	27.88	29.21	46.77	34.36	25.84
Earning quintile 2	34.9	28.56	26.13	24.94	40.23	35.62	38.89	30.22	42.61	32.92	30.63	34.00	24.68	31.19	34.04	31.93	35.08	22.19	35.18
Earning quintile 3	19.32	19.81	20.28	14.91	11.32	30.84	18.45	13.4	19.16	19.32	16.25	30.13	13.31	20.36	24.14	22.45	13.31	14.89	22.28
Earning quintile 4	8.81	11.71	18.65	8.67	6.44	9.24	4.27	11.86	8.33	10.49	8.75	7.16	7.4	9.28	5.69	12.3	4.03	17.7	8.11
Earning quintile 5	0.77	7.7	7.71	6.34	1.39	1.87	3.74	5.4	0	12.02	9.38	3.84	1.96	2.06	8.25	4.12	0.81	10.85	8.60
Part-time	18.32	28.39	22.55	53.02	39.26	30.74	26.35	16.28	40.32	27.38	9.82	9.68	24.36	43.99	19.76	24.85	15.02	7.58	22.16

Table 2.5: Predicted months in unemployment by months of work

	BE	DE	EE	IE	ES	FR	CY
Emp. Duration							
0	10.50	6.37	4.96	5.37	7.76	6.99	6.67
1	10.54	5.58	4.71	4.88	7.77	6.80	5.64
2	11.10	5.40	4.88	4.66	7.69	6.46	5.76
3	9.44	5.56	4.87	5.13	7.74	6.62	5.81
4	10.00	5.29	4.57	5.07	7.72	6.35	5.53
5	10.20	5.16	4.93	5.04	7.74	6.55	5.67
6	9.85	5.61	4.98	4.80	7.62	6.47	5.68
7	9.40	5.59	4.73	5.05	7.72	6.42	5.49
8	8.96	5.28	4.84	5.01	7.62	6.66	5.29
9	9.45	5.17	4.69	4.74	7.62	6.52	5.06
10	8.77	4.88	4.66	4.93	7.56	6.47	4.92
11	9.12	4.97	4.68	4.99	7.69	6.26	5.29
12	9.05	4.59	4.59	5.23	7.77	6.31	5.16
	AT	LT	LU	MT	PT	SI	SK
Emp. Duration							
0	6.99	8.32	7.46	3.84	7.51		6.26
1	6.35	7.45	6.85	5.33	6.51	4.57	6.70
2	6.78	7.70	6.14	4.68	6.43	4.68	6.74
3	5.14	7.49	6.29	4.40	6.39	4.40	6.52
4	5.62	7.31	5.65	4.12	6.19	4.18	6.15
5	5.32	7.27	6.13	4.69	6.25	4.69	6.32
6	5.96	7.15	6.30	4.49	6.66	4.60	6.56
7	5.91	7.18	5.65	4.51	6.13	4.54	6.60
8	5.05	7.39	5.84	4.83	6.26	4.91	6.66
9	5.13	7.00	5.84	4.00	6.19	4.00	6.57
10	4.62	7.28	5.52	4.21	6.26	4.14	6.51
11	4.57	7.69	5.92	4.23	6.34	4.27	6.48
12	4.45	6.55	4.89	4.21	5.84	4.24	6.32

Table 2.6: Work duration and predicted unemployment duration

Country	BE		DE		EE		IE	
	Work_dur	Unemp_dur	Work_dur	Unemp_dur	Work_dur	Unemp_dur	Work_dur	Unemp_dur
All	11.6	9.1	11.6	4.77	11.37	4.6	11.51	5.25
Male	11.67	9.02	11.7	4.7	11.22	4.62	11.65	5.33
Female	11.54	9.18	11.5	4.85	11.52	4.59	11.34	5.15
Age <30	10.99	11.09	10.83	4.8	10.34	4.18	11.38	4.8
Age >30	11.72	8.69	11.71	4.77	11.57	4.7	11.69	5.32
Educ_1	11.53	9.33	11.38	5.32	10.91	4.62	11.64	5.79
Educ_2	11.62	9.12	11.62	4.73	11.44	4.6	11.48	5.12
Perm_contract	11.6	9.09	11.6	4.78	11.37	4.6	11.52	5.25
Temp_contract	11.73	9.2	11.57	4.73	11.52	4.67	11.29	5.09
Full_time	11.72	9.14	11.71	4.7	11.57	4.6	11.81	5.25
Part_time	11.31	8.89	11.33	4.97	10.11	4.65	11.97	5.25
N	5515		12136		7313		5040	

Country	EL		ES		FR		IT	
	Work_dur	Unemp_dur	Work_dur	Unemp_dur	Work_dur	Unemp_dur	Work_dur	Unemp_dur
All	11.85	7.27	11.78	7.78	11.69	6.38	11.91	9.04
Male	11.9	7.36	11	7.84	11.76	6.2	11.93	9.08
Female	11.77	7.12	11.83	7.71	11.63	6.55	11.88	8.97
Age <30	11.39	7.11	10.93	7.68	11.08	5.83	11.84	9.13
Age >30	11.9	7.29	11.28	7.79	11.79	6.46	11.92	9.03
Educ_1	11.85	7.61	11.8	7.74	11.58	6.52	11.9	8.99
Educ_2	11.85	7.17	11.77	7.79	11.71	6.35	11.92	9.06
Prem_contract	11.84	7.27	11.9	7.79	11.77	6.41	-	-
Temp_contract	11.9	7.22	11.2	7.72	10.99	6.08	-	-
Full_time	11.89	7.42	11.85	7.79	11.76	6.37	11.75	8.91
Part_time	11.66	6.62	11.51	7.74	11.4	6.43	11.96	9.08
N	14155		14603		11067		18871	

Table 2.7: Work duration and predicted unemployment duration

Country	CY		LV		LT		LU	
	Work_dur	Unemp_dur	Work_dur	Unemp_dur	Work_dur	Unemp_dur	Work_dur	Unemp_dur
All	11.75	5.21	11.63	6.39	11.73	6.59	11.55	4.98
Male	11.74	5.36	11.72	6.52	11.74	6.45	11.61	4.77
Female	11.76	5.07	11.55	6.26	11.72	6.73	11.61	5.22
Age <30	11.19	5.04	10.97	6.4	10.71	6.47	11.61	5.1
Age >30	11.83	5.24	11.74	6.39	11.85	6.61	11.61	4.95
Educ_1	11.57	5.67	11.16	6.47	11.18	6.53	11.61	5.08
Educ_2	11.79	5.12	11.67	6.38	11.75	6.6	11.61	4.94
Prem_contract	11.74	5.22	11.63	6.38	11.76	6.59	11.61	4.98
Temp_contract	11.93	5.12	11.63	6.58	10.14	6.65	11.61	4.94
Full_time	11.89	5.19	10.66	6.58	11.84	6.56	11.61	4.87
Part_time	11.1	5.36	11.76	6.36	11.01	6.83	11.61	5.37
N	4614		6069		4820		4804	

Country	MT		NL		AT		PT	
	Work_dur	Unemp_dur	Work_dur	Unemp_dur	Work_dur	Unemp_dur	Work_dur	Unemp_dur
All	11.51	4.27	11.55	5.59	11.48	2.07	11.87	6.14
Male	11.62	4.53	11.57	5.44	11.65	1.98	11.87	6.27
Female	11.34	3.89	11.52	5.73	11.29	2.18	11.87	6.01
Age <30	11.08	4.49	9.67	5.39	10.56	2.29	11.45	5.9
Age >30	11.65	4.2	11.86	5.62	11.7	2.02	11.93	6.17
Educ_1	11.55	4.49	11.56	5.69	11.18	2.08	11.87	6.18
Educ_2	11.48	4.11	11.55	5.56	11.51	2.07	11.87	6.09
Prem_contract	11.51	4.27	11.55	5.59	11.52	2.06	11.86	6.13
Temp_contract	11.54	4.22	11.66	5.54	10.77	2.4	11.9	6.14
Full_time	11.71	4.33	11.4	5.72	11.71	1.95	11.49	6.91
Part_time	10.55	4.01	11.69	5.46	10.87	2.41	11.91	6.05
N	4552		14029		6193		10808	

Country	SI		SK		FI	
	Work_dur	Unemp_dur	Work_dur	Unemp_dur	Work_dur	Unemp_dur
All	11.8	6.09	11.76	6.37	10.48	4.91
Male	11.79	5.84	11.84	6.49	10.65	4.91
Female	11.8	6.39	11.67	6.24	10.3	5.04
Age <30	10.8	5.18	11.39	6.24	7.04	4.41
Age >30	11.94	6.22	11.83	6.4	11.2	5.02
Educ_1	11.87	6.28	11.79	6.46	8.01	4.99
Educ_2	11.79	6.07	11.76	6.38	10.86	4.9
Prem_contract	11.8	6.09	11.75	6.37	10.47	4.93
Temp_contract	11.79	6.13	11.82	6.33	10.67	4.62
Full_time	11.83	6	10.49	6.9	11.39	4.77
Part_time	11.32	7.23	11.82	6.34	7.56	5.37

Table 2.8: Potential coverage rates by worker types

	All workers			Part-time workers		
	Baseline	EMU	Increase	Baseline	EMU	Increase
BE	83.91	92.78	8.87	51.08	91.35	40.27
DE	80.28	88.73	8.45	73.3	83.18	9.88
EE	73.8	90.1	16.3	43	71.69	28.69
IE	61.7	69.43	7.73	54.47	61.8	7.33
EL	62.94	65.1	2.16	62.38	67.45	5.07
ES	70.77	82.45	11.68	57.05	79.84	22.79
FR	88.11	89.13	1.02	82.88	84.79	1.91
IT	74.29	77.42	3.13	75.21	80.01	4.8
CY	79.5	84.26	4.76	54.71	66.54	11.83
LV	78.49	88.54	10.05	48.19	70.68	22.49
LT	59.11	85.62	26.51	45.66	66.39	20.73
LU	93.42	96.32	2.9	82.2	93.55	11.35
MT	43.29	83.53	40.24	49.63	80	30.37
NL	81.03	84.81	3.78	79.02	83.63	4.61
AT	79.4	84.68	5.28	74.35	80.36	6.01
PT	76.21	84.22	8.01	47.24	67.24	20
SI	90	95.89	5.89	63.8	86.67	22.87
SK	72.48	86	13.52	35.96	68.21	32.25
FI	83.25	88.05	4.8	34.96	53.64	18.68
	Temporary contract workers			3% highest risk workers		
	Baseline	EMU	Increase	Baseline	EMU	Increase
BE	1.9	86.3	84.4	2.32	92.25	89.93
DE	70.1	83.82	13.72	90.52	95.72	5.2
EE	40	60	20	73.44	95.83	22.39
IE	47.94	49.77	1.83	39.53	41.54	2.01
EL	66.5	69.57	3.07	89.05	89.91	0.86
ES	44.73	83.23	38.5	91.05	94.85	3.8
FR	80.64	85.68	5.04	96.53	98.26	1.73
IT	-	-	-	68.11	73.92	5.81
CY	66.67	68.75	2.08	77.48	79.28	1.8
LV	61.54	76.92	15.38	85.32	93.58	8.26
LT	12.76	66.67	53.91	89.26	93.44	4.18
LU	80.64	93.54	12.9	96.75	99.19	2.44
MT	40	85	45	9.2	82.31	73.11
NL	75	83.22	8.22	85.86	99.19	13.33
AT	65.87	80.24	14.37	91.5	96.08	4.58
PT	46.79	63.3	16.51	89.93	95.68	5.75
SI	63.79	82.76	18.97	80.5	92.91	12.41
SK	63.16	73.68	10.52	59.2	84.08	24.88
FI	78.86	89.26	10.4	84.85	96.36	11.51

Table 2.9: Net replacement rates by worker types

	All workers			Part-time workers		
	Baseline	EMU	Increase	Baseline	EMU	Increase
BE	64.84	74.81	9.97	76.01	80.63	4.62
DE	74.13	61.18	2.87	85.74	88.68	2.94
EE	63.58	68.32	4.74	79.45	82.39	2.94
IE	63.40	63.40	0.00	75.64	82.63	6.99
EL	68.43	72.05	3.62	85.33	85.77	0.44
ES	65.29	78.91	13.62	79.74	89.76	10.02
FR	73.34	78.36	5.02	82.55	85.83	3.28
IT	61.33	77.27	15.94	68.42	81.46	13.04
CY	69.38	73.09	3.71	58.45	80.11	21.65
LV	66.08	67.84	1.76	75.22	77.11	1.89
LT	73.44	74.54	1.10	77.58	78.78	1.20
LU	77.44	80.44	3.01	87.51	89.46	1.95
MT	58.96	62.38	3.42	75.18	77.42	2.24
NL	65.17	65.27	0.10	74.27	74.29	0.02
AT	64.29	66.36	2.08	77.98	79.57	1.59
PT	69.14	70.81	1.67	80.66	82.58	1.92
SI	66.18	67.05	0.87	79.27	79.38	0.11
SK	69.07	74.63	5.56	82.12	85.41	3.29
FI	66.64	70.14	3.50	81.39	82.49	1.10
	Temporary contract workers			3% highest risk workers		
	Baseline	EMU	Increase	Baseline	EMU	Increase
BE	65	57.25	19.11	56.25	60.61	4.35
DE	75.3	64.220	3.716	66.04	75.49	9.45
EE	65.2	70.68	5.51	44.84	58.06	13.22
IE	60.95	70.83	9.87	45.06	52.22	7.16
EL	67.26	71.37	4.11	80.47	81.47	1.00
ES	75.80	88.35	12.55	59.30	78.63	19.33
FR	81.30	84.83	3.53	64.19	70.86	6.67
IT	61.33	77.27	15.94	55.03	73.64	18.61
CY	46.86	52.77	5.91	53.87	58.68	4.82
LV	62.94	64.69	1.75	42.18	45.82	3.64
LT	70.67	74.54	3.88	73.47	74.34	0.87
LU	69.18	72.52	3.34	76.38	78.21	1.83
MT	39.69	41.73	2.04	59.08	59.97	0.90
NL	60.18	60.54	0.35	55.95	56.26	0.31
AT	72.73	74.47	1.74	64.80	65.28	0.48
PT	69.34	70.98	1.65	52.71	53.32	0.61
SI	48.45	49.00	0.55	50.78	51.46	0.68
SK	68.90	74.18	5.27	46.55	53.05	6.50
FI	48.93	52.38	3.45	57.50	61.29	3.79

Table 2.10: Poverty rates by worker types

	All workers			Part-time workers		
	In-work poor	Still at risk	Protected	In-work poor	Still at risk	Protected
BE	8.92	25.11	9.02	8.26	13.83	3.98
DE	14.13	17.41	2.31	15.17	7.74	3.25
EE	7.92	22.32	3.72	17.66	14.11	1.42
IE	3.91	10.72	11.14	8.77	10.52	4.14
EL	12.27	20.1	5.37	20.5	11.96	0.64
ES	16.35	10.37	14.21	30.01	7.97	7.15
FR	5.28	11.24	6.49	11.68	10.78	4.54
IT	15.77	12.27	22.9	23.73	11.9	9.69
CY	8.28	19.63	5.29	14.88	15.07	2.18
LV	8.35	20.38	1.71	20.07	16.71	1.49
LT	7.87	11.81	1.3	17.79	13.79	2.32
LU	4.66	7.57	2.33	6.47	5.37	1.89
MT	10.5	34.06	5.21	9.67	13.62	3.82
NL	5.22	26.71	-0.07	5.76	17.64	-0.13
AT	13.14	16.81	2.18	14.72	17.16	2.28
PT	11.17	19.21	1.94	25.18	13.95	2.63
SI	10.63	23.66	1.9	28.43	17.39	0.9
SK	5.38	15.69	6.28	12.39	12.11	3.1
FI	8.18	16.58	3.66	16.78	7.97	0.82
	Temporary contract workers			3% highest risk workers		
	In-work poor	Still at risk	Protected	In-work poor	Still at risk	Protected
BE	4.85	24.23	5.73	15.5	69.77	7.75
DE	8.82	11.15	4.15	17.12	14.37	13.15
EE	10.49	25.87	4.2	18.75	35.75	16.67
IE	5.82	13.23	11.11	20.93	65.11	8.36
EL	13.15	20.77	5.75	20.75	8.93	0
ES	30.99	9.5	8.74	23.31	8.94	47.88
FR	13.16	13.93	4.34	7.99	21.87	6.25
IT				26.95	20.28	9.35
CY	7.96	16.42	5.47	9.91	36.94	3.6
LV	8.8	22.01	1.89	11.93	49.54	4.59
LT	26.73	19.8	2.48	15.7	18.03	1.11
LU	6.36	5.45	1.82	3.25	10.57	0.81
MT	3.79	31.82	3.03	13.08	63.85	0
NL	8.84	32.6	0.55	15.01	40.68	-0.63
AT	17.03	29.2	4.38	11.76	39.87	0
PT	10.23	19.74	2.14	19.78	54.32	0.36
SI	12.93	24.06	0.6	1.42	86.88	0.71
SK	6.83	17.08	8.38	11.94	56.72	15.42
FI	16.4	13.09	1.99	14.85	42.42	3.34

Table 2.11: Income protection indicators: The self-employed

	Coverage rates			NRR			Poverty rates		
	Baseline	EMU-UI	Increase	Baseline	EMU-UI	Increase	Baseline	EMU-UI	Increase
BE	0	95.75	95.75	66.06	74.46	8.40	10.61	25.48	10.49
DE	0	89.47	89.47	52.25	66.24	13.99	13.52	21.2	17.66
EE	0	84.61	84.61	78.44	87.07	8.63	23.08	14.53	9.39
IE	0	75.65	75.65	65.79	80.04	14.26	7.29	10.42	12.38
EL	0	95.67	95.67	61.18	83.39	22.21	21.7	10.6	22.63
ES	0	94.09	94.09	68.18	87.88	19.70	26.65	11.47	19.15
FR	0	93.01	93.01	68.07	77.21	9.14	18.38	21.69	6.8
IT	0	90.78	90.78	55.04	75.27	20.23	30.04	12.86	12.42
CY	0	89.52	89.52	66.61	71.07	4.46	9.85	28.72	7.13
LV	0	89.38	89.38	66.88	75.97	9.10	32.74	21.14	8.07
LT	0	93.85	93.85	51.65	66.40	14.75	13.23	17.85	19.73
LU	93.83	94.71	0.88	82.69	85.83	3.14	10.13	3.96	3.08
MT	0	95.67	95.67	59.12	64.48	5.36	10.6	29.65	6.64
NL	0	94.46	94.46	54.24	62.80	8.56	9.2	25.43	10.3
AT	0	93.25	93.25	68.16	70.96	2.80	15.15	33.03	0.57
PT	0	93.7	93.7	63.23	77.09	13.85	15.08	12.59	21.74
SI	92.2	95.78	3.58	81.14	81.47	0.33	31.3	12.2	0.72
SK	0	98.68	98.68	73.02	83.87	10.85	16.73	13.57	12.78
FI	85.65	87.44	1.79	73.92	77.03	3.11	13	18.19	4.87

Chapter 3

The impact of a European unemployment benefit scheme on labour supply and income distribution

This chapter was co-authored with

Mathieu Lefèbvre

Summary of the chapter

This paper investigates the effect of introducing a European unemployment insurance scheme (EMU-UI) on the labour supply and income distribution in the Eurozone countries. We simulate various reform scenarios based on structural estimation of the labour supply and using the European tax-benefit microsimulation model EUROMOD. The results show that the labour supply response to the introduction of an EMU-UI differs substantially across countries and depends on the design of the EMU-UI. We find that a flat EMU-UI scheme implies a powerful disincentive to work but reduces poverty. On the contrary, a fully contribution-related EMU-UI system limits the distortions on the labour market in most countries but has limited effects on poverty and inequality. An EMU-UI with a common replacement rate, articulated with floor and ceiling amounts, would allow for upward convergence as it would strongly reduce poverty and inequality in several countries while not inducing important labour supply reduction.

3.1 Introduction

The recent financial and sovereign debt crisis has put back on the agenda the need for the European Monetary Union (EMU) of a common budgetary instrument that would make the Union more resilient to shocks. Among others, the idea of a common unemployment insurance scheme (EMU-UI hereafter) has been extensively discussed for its strong stabilisation power[1]. Since employment and social outcomes are often seen as decisive factors for the sustainability and legitimacy of the monetary union [Del Monte and Zandstra, 2014], a common EMU-UI scheme would provide a countercyclical stabilisation mechanism in the euro area. It could act as an insurance device in the presence of asymmetric macroeconomic shocks. The project of an EMU-UI system has been brought up to date by the Covid-19 crisis. A temporary Support to mitigate Unemployment Risks in an Emergency (SURE) plan has been implemented to increase workers' protection via a short-time work scheme (STW). In particular, it has been argued that SURE, although temporary, should be seen as an emergency operationalisation of a European Unemployment Re-insurance Scheme in the specific context of the COVID-19 crisis; this without prejudice to the possible subsequent establishment of a permanent instrument under a different legal basis in the TFEU[2]. Thus the will of the European authorities to move towards a European unemployment scheme is well present.

In this paper, we evaluate the impact of the introduction of an EMU-UI system on the labour supply in each EMU country. Using the EU tax-benefit microsimulation model EUROMOD, we simulate the introduction of a common unemployment insurance system in the 19 countries of the monetary Union. To analyze the potential effects of an EMU-UI scheme, we combine microsimulation techniques with a structural model of labour supply. The model follows previous works by van Soest [1995], Blundell et al. [2000], and Bargain et al. [2014] and allows to account for the nonlinear and nonconvex budgets sets of complex tax and benefit systems. Various

[1]Herman Van Rompuy, as a President of the European Council in the Van Rompuy report of 2011, suggested that an EMU budgetary capacity with a limited asymmetric shock absorption function could take the form of unemployment insurance. In the Five Presidents' report, Jean-Claude Juncker also puts forward the idea of an EMU-UI [Dullien, 2014, Claeys et al., 2014, Andor, 2014].

[2]Treaty on the Functioning of the European Union.

ways of designing a common EMU-UI scheme have been proposed in the literature and the policy debate[3]. The propositions go from providing a basic level of insurance that partly replaces national schemes (Dullien et al, 2017) to a more contingent system which triggers payments based mainly on unemployment rate deviation from the long run tendencies [Carnot et al., 2017]. We then simulate different scenarios to reflect the different propositions of an EMU-UI scheme, and we compare the effects of these scenarios on two issues. First, we look at the employment effects for singles and individuals in the couple. In particular, we are interested in the (dis)incentives to work on an extensive and intensive margin. Second, we look at the distributional effects taking into account the behavioural responses of labour supply.

Recent studies have assessed the stabilisation properties of an EMU-UI scheme [Jara et al., 2015, Dolls et al., 2016, 2018] as well as its income protection effects [Jara and Sutherland, 2014, Jara et al., 2016]. In particular, Dolls et al. [2018] have assessed the income stabilisation effect and the budgetary issues of introducing a European unemployment insurance. Based on microsimulations and looking at the change in disposable income for the unemployed, they found a significant stabilisation effect. In particular, they pointed out the inter-temporal and inter-regional stabilisation that could take place without having any net contributor or recipient countries in the long run. Jara and Sutherland [2014] and Jara et al. [2016] also used micro data to analyse how an EMU-UI system that top-up national systems affect income protection. Their results show that introducing an EMU-UI scheme could positively affect households' income stabilisation and reduce the risk of poverty. The common minimum standards implied by the EMU-UI would increase unemployment benefits' replacement and coverage rates.

To our knowledge, no studies have looked at the labour supply implications of introducing an EMU-UI system. Though, in changing both the generosity and the duration of unemployment insurance benefits, an EMU-UI scheme is likely to affect labour supply decisions. Especially, it has be shown that a change in the level of UI benefits can affect the duration of unemployment spell [Krueger and Meyer, 2002, Chetty, 2008, Lalive et al., 2006a, Landais, 2015, Schmieder et al., 2016]. For example, a higher generosity of UI benefits tends to affect the duration of unemployment via an increase in reservation wage [Feldstein, 1976, Krueger and Mueller, 2016] and a reduction of job search effort [Krueger and Mueller, 2010, Le Barbanchon, 2016, Le Barbanchon et al., 2019]. Furthermore, several studies have shown that when

[3]See among others Dullien [2014], Andor [2014] and Claeys et al. [2014].

benefits expire, the job search rate increases [Moffitt, 1985, Katz and Meyer, 1990, Card et al., 2007]. However benefit duration seems to imply very small labour supply effects (see Krueger and Meyer [2002] for a survey). The introduction of an EMU-UI that could change levels, duration and eligibility of benefits needs to be evaluated on employment and social protection grounds. This is particularly important to compare countries to identify the diverging effects such a reform could have.

Anticipating our results, we show that the labour supply implications differ much regarding EMU-UI designs. We find that a flat-rate EMU-UI, which tends more towards a Beveridgian model, would imply a powerful disincentive to work, even though the poverty reduction associated is consequent. A basic EMU-UI, fully contribution-related, would limit much more the distortions on the labour market in most countries but would have limited effects on poverty and inequality. An EMU-UI with a common replacement rate, articulated with floor and ceiling amounts, would allow for upward convergence as it would strongly reduce poverty and inequality in several countries, especially where poverty rates tend to be high, while not inducing too substantial labour supply reduction.

The rest of the paper is organized as follows. Section 2 presents the EMU-UI proposal and the various scenarios. Section 3 develops the empirical strategy and presents the data. The structural labour supply model results are presented in Section 4, along with estimated elasticities. Section 5 presents the employment effects of introducing an EMU-UI, and Section 6 shows how poverty and inequality are affected. Conclusions are drawn in Section 7.

3.2 The EMU-UI

In recent years, the introduction of a European unemployment insurance scheme has been discussed in the economics literature and the policy debate. As exposed by Dolls et al. [2018], three different systems have been proposed. The first proposal is a common EMU-UI scheme, also called a "genuine" system, that would partly replace national UI schemes and would introduce common minimum standards and a basic level of insurance, as considered by Dullien [2014], Strauss et al. [2013], Andor [2014] and the European Commission (2014, 2014). In this scheme, benefits could be topped up by additional payments from national unemployment insurance systems. This system would only cover short-term unemployment, and long-term unemployment would not be covered to preserve incentives for national policy-makers. An

alternative to this proposal would be an "equivalent" system consisting of transfers between member states in case of large economic shocks [Beblavỳ and Maselli, 2014, Beblavỳ et al., 2015, Carnot et al., 2017]. This would take the form of a re-insurance system. Such a system would only be triggered if unemployment reached some pre-determined level. The last option considers a system in which the EMU-UI scheme complements the national systems by providing additional benefits, which would either top up national benefits or kick in if national benefits were to expire. The "genuine" system seems more challenging than an "equivalent" system as it would imply harmonisation of unemployment benefits systems [Esser et al., 2013]. At the same time, a "genuine" system would allow for upward convergence of national UI systems beyond its stabilisation function, as there are sizable gaps in accessibility to unemployment benefits between countries [Jara et al., 2016].

In this paper, we are mainly concerned with the first proposal which is also the one that has been largely studied, both in terms of stabilizing effects [Dullien, 2013, Dolls et al., 2016, Beblavý and Lenaerts, 2017] and income protection [Jara and Sutherland, 2014, Jara et al., 2016]. In particular, several features of a EMU-UI system have been widely discussed and recent debates have focused on the degree of eligibility or the generosity of transfers. Although those aspects are important in terms of budget size and stabilisation properties, from an individual viewpoint, other characteristics such as benefit duration and replacement rate could also affect income protection of workers or incentives to work. If the main goal of an EMU-UI system is to stabilise the economy, it should only cover the cyclical part of unemployment and avoid financing the frictional unemployment and the long-term unemployment. Thus it is commonly accepted that the benefit duration should be between three to twelve months[4]. Regarding the benefit's replacement rate, the most considered proposal is a replacement rate of 50% of previous gross earnings. This level has been shown to be sufficient to avoid unemployment trap [Krueger and Mueller, 2010]. However floors and caps are also considered[5]. Finally, the eligibility rules, determined as the number of months an individual should contribute in order to be entitled to benefits, may matter too. It is usually accepted that the conditions to access benefits should be light and most proposals consider 3 months of contributions over the last year.

[4]In practice, this could be administratively complex to hang from national to supranational scheme in the third month of unemployment. It could be easier to start EMU-UI payments from the first month of unemployment, as suggested by Beblavý and Lenaerts [2017].

[5]For example, Beblavý and Lenaerts [2017] propose a capping at 150% of national average earning. Jara et al. [2016] also consider a floor at 30% of national average earning. Delpla [2012] propose a capping at 2000 euros per months for every country.

Depending on the choice of parameters for these key features, we may expect different effects in terms of incentives to supply labour and or redistribution and income protection. In the following, we follow proposals by Beblavý and Lenaerts [2017] as well as Jara et al. [2016] and simulate four different reform scenarios. In the first three scenarios, we vary the key features of an EMU-UI scheme that would partly replace national unemployment insurance systems. In the fourth scenario, we consider an EMU-UI scheme that would completely substitute to national systems:

- *Scenario 1 (Basic EMU-UI)* focuses on a basic benefit with a replacement rate of 50% of previous gross individual earnings available to all currently employed up to age 64. Workers need to have contributed during at least 3 months during the last 12 months. The benefit covers eligible individuals from the 1st to the 12th months of unemployment.

- *Scenario 2 (Floor and ceiling EMU-UI)* introduces to Scenario 1 ceilings and floors applicable to unemployment benefits. The latter are bounded between 30% of national average earnings and a ceiling at 150% of national average earnings applies[6].

- In *Scenario 3 (Flat-rate EMU-UI)*, we keep the same parameters as in Scenario 2 but the generosity level is changed. Instead of a replacement rate determined by individual earnings, the benefits are now set by a flat rate of 50% of average national earnings. This reform aims at looking at the effect of a kind of Beveridgian system.

In these first three scenarios, the EMU-UI is topped-up by national systems and consequently there is no reduction of benefit generosity. Differently said, all countries benefit from the EMU-UI and national systems simply transfer the difference between their own benefit level and the EMU-UI benefit level to unemployed individuals. In order to study a full harmonisation of national UI systems in the Eurozone, we simulate a last scenario with a complete substitution of national UI system by a EMU-UI:

- In *Scenario 4 (Full substitution EMU-UI)* , we then simulate a basic EMU-UI with the same characteristics as Scenario 1 which fully replaces national UI. This means that the EMU-UI is not topped-up by national systems.

[6]In our simulation, we use the Eurostat data from the *Structure of earnings survey* 2018 on mean employment earning per month to determine these national floors and ceilings.

3.3 Empirical strategy

3.3.1 The structural labour supply model

In order to estimate the labour-supply response to the introduction of the EMU-UI, we opt for a structural discrete choice model [Blundell et al., 2000, van Soest, 1995]. This approach is convenient because it allows to apply quite general specifications of the utility function and the budget constraint. Especially it provides a straightforward way to account for the nonlinear and nonconvex budget sets of complex tax and benefit systems when modeling individual and joint labour supplies of couples. One important aspect of the framework is that the choice set is discretized; that is the individual decision of labour supply is restricted to a set of alternatives, which allow to represent non-participation (inactivity), part-time and full-time working so that both extensive and intensive margins are estimated.

We model the labour supply decision of individuals defined as being the utility maximizing choice between a set of discrete hours choices. Let $U(C, H^m, H^w)$ denote the utility function of the household, where C is the household consumption and H^w and H^m are spouses' work hours, women and men respectively. Accordingly, the utility of a couple i at each discrete choice $j = 1, ..., J$ can be written as:

$$U_{ij} = V(C_{ij}, H^m_{ij}, H^w_{ij}, Z_i) + \epsilon_{ij}$$

where V_{ij} is a deterministic function which depends on households' characteristics and the alternatives and ϵ_{ij} is a random error term. If ϵ_{ij} is assumed to be identically and independently distributed across alternatives and households according to an EV-I distribution, the probability that alternative j is chosen by household i is given by (McFadden, 1974):

$$P_{ij} = \frac{\exp V(C_{ij}, H^m_{ij}, H^w_{ij}, Z_i)}{\sum_{k=1}^{J} \exp V(C_{ik}, H^m_{ik}, H^w_{ik}, Z_i)}$$

Identification is conditional on the a-priori functional form of the structural utility term. In line with van Soest [1995] and Blundell et al. [2000], the deterministic utility function of a couple has the following functional form:

$$\begin{aligned} V_{ij} =& \beta_{ci} C_{ij} + \beta_{cc} C^2_{ij} + \beta_{h_w i} H^w_{ij} + \beta_{h_m i} H^m_{ij} + \beta_{h_{ww}} (H^w_{ij})^2 + \beta_{h_{mm}} (H^m_{ij})^2 + \beta_{ch_w} C_{ij} H^w_{ij} \\ &+ \beta_{ch_m} C_{ij} H^m_{ij} + \beta_{h_m h_w} H^w_{ij} H^m_{ij} - \alpha^w_j * 1(H^w_{ij} > 0) - \alpha^m_j * 1(H^m_{ij} > 0) \end{aligned} \tag{3.1}$$

where α_j^w and α_j^m are fixed costs equal to zero in case of inactivity of the spouses ($H_{ij}^m = 0$ or $H_{ij}^w = 0$) and non-zero for $H_{ij}^m > 0$ or $H_{ij}^w > 0$. The introduction of these fixed costs of working improves the fit of the model but also implicitly accounts for difference in demand side constraints and the availability of jobs. We assume that preferences vary across households through taste-shifters on coefficients on consumption and work hours:

$$\beta_{ci} = \beta_c^0 + z_i^c \beta_c + v_i \tag{3.2}$$

$$\beta_{h_w i} = \beta_{hw}^0 + z_i^w \beta_{hw} \tag{3.3}$$

$$\beta_{h_m i} = \beta_{hm}^0 + z_i^m \beta_{hm} \tag{3.4}$$

where z_i^c, z_i^w and z_i^m are vectors including polynomial form of age, number of children, presence of young children and presence of elderly in the household. The term β_{ci} also incorporates unobserved heterogeneity, in the form of a normally distributed term v_i, this to allow random taste variation and unrestricted substitution patterns between alternatives.

The model is estimated by allowing choice between four alternatives for each individual, which corresponds to $J = 4 * 4 = 16$ alternatives in total for the couple[7]. The alternatives are: Non-Participation (0 hours of work), Part-time work (1-29 hours of work), Full-time work (30-49 hours of work) and Over-time work (50+). In the case of singles, we restricted the option set to four alternatives of working hours and we estimate the same model except that H_{ij}^w is excluded.

For each discrete choice, disposable income (equivalent to aggregate household consumption in a static framework) is calculated as a function of hourly wage rate (w_i), women and men earning hours (H_{ij}^m, H_{ij}^w), non labour income (y_i) and household characteristics (z_i). The consumption function can then be theoretically derived as follow:

$$C_{ij} = d(w_i^m H_{ij}^m, w_i^w H_{ij}^w, y_i, z_i)$$

The function d is calculated using the tax-benefit microsimulation EUROMOD that we describe in the next section. The approach provides a straightforward way to

[7]We chose this set of hours in order to alleviate the computational burden especially for the estimation for couple. We find a similar fit of the model with this set of hours compare to a larger set such as 7 discrete choices. Bargain et al. [2014] estimated a structural labour supply model for European countries and found that results was similar with 13, 7 or 4 hours categories.

account for the nonlinear and nonconvex budget sets of complex tax and benefit systems when modeling individual and joint labour supplies of spouses [Bargain et al., 2010]. With the help of EUROMOD, we simulate the disposable income for each worked hours in order to compute the budget constraint. Wage rates for women and men in each household i (w_i^m, w_i^w) are calculated by gross earning divided by working hours. In order to predict wages for non-workers, we estimate a Heckman-corrected wage equation, which allow to take into account the differences in characteristics between workers and non-workers[8]. In order to reduce the problem of division bias [Borjas, 1990], we use the predicted wages for all observations[9]. Finally, we incorporate the wage prediction error in the labour supply estimation to avoid inconsistent estimates of the structural parameters [van Soest, 1995].

3.3.2 Data and tax-benefit microsimulation

The analysis makes use of the tax–benefit microsimulation model EUROMOD that is based upon harmonized EU-SILC data (European Union Statistics on Income and Living Conditions). Datasets have been harmonized in the sense that similar income concepts are used together with comparable variable definitions. The EUROMOD model makes use of detailed information on household composition, characteristics of household members and their incomes from the EU-SILC to create common definitions of income concepts that allow for a very detailed and harmonized micro–level calculation of taxes and benefits.[10] Thus, EUROMOD allows simulating the fiscal and social policies in place in all European countries by calculating the entitlement and tax liabilities for each individual in each household. By calculating the disposable income of each individual with nationally representative micro data, the microsimulation model is useful to perform comparative distributional analysis between EU countries, as well as to assess the budgetary and work incentive effects of policy reforms. Indeed EUROMOD allows for counterfactual ex-ante simulations.

EUROMOD covers 28 countries of the European Union but we focus on the

[8]Results are presented in Tables A.1 and A.2 the Appendix.

[9]see also Aaberge et al. [1999] and Bargain et al. [2014]. This two-stage procedure is common practice [Creedy and Kalb, 2005].

[10]The results presented here are based on EUROMOD version I3.0+. Originally maintained, developed and managed by the Institute for Social and Economic Research (ISER), since 2021 EUROMOD is maintained, developed and managed by the Joint Research Centre (JRC) of the European Commission, in collaboration with EUROSTAT and national teams from the EU countries. We are indebted to the many people who have contributed to the development of EUROMOD. The results and their interpretation are the author's(') responsibility. For more details on EUROMOD, see Sutherland [2001] and Sutherland and Figari [2013].

19 countries of the Eurozone that are concerned with the possibility of a common unemployment insurance system. We also focus on the 2018 tax-benefit rules of the countries using the underlying micro-data from 2016 (EU-SILC 2016). Market incomes and non-simulated tax-benefit instruments in the data are adjusted to 2016 levels using source-specific updating factors. For the estimation of labour supply, we restrict our sample to individuals aged between 16 to 64 years old who are neither students, self-employed, disabled or retired. We do not considered self-employed individuals as they are excluded from the EMU-UI[11], they are not affected by the reforms. We also exclude self-employed due to the difficulty to measure working hours and wages for this type of workers. We distinguish between four groups: single women, single men, women and men in couple.

Table 3.1 presents descriptive statistics of the relevant variables for couples and singles, separately for men and women. Working hours are quite heterogeneous between countries, especially for women in couple. The number of working hours of women in couple is particularly low in Greece, Ireland, Malta, Netherlands and Italy with averages around 20-23 hours per week. This is essentially due to low labour market participation in these countries. In comparison, in Finland, France, Estonia, Lithuania Latvia and Slovakia, the participation rate of women in couple is much higher and they work more than 30 hour a week on average. There is less disparities between countries in terms of working hours for men in couple which ranges between 33 to 39 hours per week on average with a mode around 35. Participation rates of married men are higher than 80% in all countries, exception made for Belgium, Greece and Portugal. Working hours and participation rates for single women tends to be higher than women in couple, even though they are very low in Greece, Ireland, Malta and Netherlands to a lesser extent. Working hours and participation for single men are also very low in Greece, Finland and Ireland in comparison to other countries.

Hourly wage rates, which are estimated and predicted for both observed and unobserved wages in the sample (see 3.3.1 for more details regarding the wage estimation procedure), are on average lower for women than for men. The lowest levels are observed in Slovakia, Latvia, Lithuania and Estonia for which it is lower than 7 euros. In most countries, we find lower predicted wages for married women than single women, which is in line with common findings. We predict particularly high

[11]In most EMU-UI proposals, self-employed are excluded from it as many self-employed do not have access to current national UI (and do not pay contributions) or have access to specific unemployment assistance. We based mainly our reform scenarios on EMU-UI alternatives simulated by Beblavý and Lenaerts [2017] and none of them include self-employed.

wage rate in Luxembourg, the Netherlands and Belgium. In order to make comparison between countries, we will present how sensitives are labour supply choices regarding those predicted wages in the next sections.

Finally, the age is similar in countries of the sample with an average age of 45 years. The composition of the household changes between countries with a number of children for couples going from 0.3 in Slovakia to 1,3 in Ireland.

3.4 Estimation results

The labour supply model presented in Section 3.3.1 is estimated for each country and separately for couple and single men and women. We present the results in two steps. First we comment on the structural model estimation and its power to replicate the observed labour supply. We then compare labour supply elasticities across countries. Elasticities of labour supply to exogenous changes in budget constraints will be key to evaluate the impact of the reforms.

3.4.1 Labour supply estimates

Table A.3 to A.11 in the appendix present the results of the estimations separately for men and women and according to marital status[12]. Although the coefficients of a discrete choice model have a few intuitive interpretation and little can be said about their magnitude, the signs of the coefficients are broadly in line with previous findings. As expected, the presence of children in the household reduces the probability to work for women in all groups and in most countries. On the contrary, the presence of elderly decreases preference for leisure of women. Taste shifters related to age are not always significant and do not display clear patterns. Interestingly, the fixed cost of work is negative and significant for both singles and couple, suggesting some disutility associated to work. As pointed out by Bargain et al. [2014], we cannot directly compare preferences across countries, given the large number of model parameters but we will compare labour supply elasticities in the next subsection.

The pseudo-R^2 and the log-likelihood of the estimations show that the fit is rather good. The pseudo-R^2 is about 0.35 on average for single women and men and 0.4 for couples. In order to judge the prediction power of the model, Table 3.2 compares average observed and predicted hours of work. On average, the model

[12]Table A.1 and A.2 in the appendix presents also the results of the estimation of the wage equation for women and men respectively.

Table 3.1: Descriptive statistics

	AT	BE	CY	DE	EE	EL	ES	FI	FR	IE	IT	LT	LU	LV	MT	NL	PT	SI	SK
	Single women																		
Age	43.4	46.1	45.3	48.5	47.6	49.6	48.5	46.4	45.8	47.6	48.1	49.2	44.4	47.4	48.5	49.0	48.8	44.9	47.3
# of children	0.32	0.44	0.22	0.21	0.31	0.17	0.28	0.30	0.46	0.58	0.21	0.29	0.34	0.39	0.35	0.22	0.30	0.35	0.30
Pred. wage	15.01	14.2	9.0	17.5	4.1	9.6	14.8	19.4	30.3	6.3	6.7	2.7	18.5	4.3	7.9	21.8	8.4	13.0	7.4
Weekly hours	31.3	23.9	30.6	30.2	38.0	16.2	24.6	31.0	30.4	18.5	26.8	33.9	29.2	36.1	18.9	23.1	29.2	32.8	36.2
Part. rate	87.9	70.1	76.3	84.6	97.2	41.9	68.1	87.0	83.7	62.1	75.2	89.3	79.1	92.1	50.7	75.5	74.4	83.7	91.5
	Single men																		
Age	41.9	43.5	43.5	46.9	42.8	42.3	44.7	42.2	43.3	47.7	43.9	46.6	41.9	44.8	43.5	45.8	45.9	44.5	45.0
# of children	0.01	0.09	0.04	0.03	0.03	0.01	0.04	0.05	0.12	0.05	0.02	0.03	0.03	0.05	0.02	0.04	0.06	0.04	0.02
Pred. wage	16.0	16.1	13.3	19.0	4.0	7.8	13.9	24.6	30.5	5.2	7.6	2.1	20.4	4.5	8.9	21.1	9.2	14.3	8.0
Weekly hours	36.4	31.1	33.0	34.6	37.2	27.1	31.6	29.7	33.9	25.0	32.8	31.3	38.3	34.4	35.7	31.6	30.6	33.1	35.0
Part. rate	91.9	81.3	82.6	85.1	90.8	66.2	80.7	79.5	88.3	68.7	87.6	82.2	91.3	87.8	87.9	86.1	74.3	82.5	83.9
	Couple women																		
Age	41.4	41.0	42.6	45.9	43.3	44.0	43.9	43.9	41.9	43.0	43.4	48.3	40.1	44.7	41.8	45.7	44.2	42.4	47.3
# of children	0.69	0.79	0.79	0.46	0.68	0.66	0.69	0.70	0.78	1.27	0.71	0.42	0.76	0.60	0.70	0.63	0.63	0.85	0.30
Pred. wage		36.0	8.1	17.2	4.2	8.0	12.5	33.3	18.2	10.2	4.9	4.9	26.2	2.4	9.7	37.6	13.5	22.1	4.2
Weekly hours	26.0	24.8	24.6	25.7	31.7	20.4	26.0	31.9	30.0	20.4	22.7	34.0	27.0	31.3	22.2	22.3	29.7	31.2	36.2
Part. rate	82.6	73.3	69.6	79.1	82.6	53.5	73.2	88.1	84.4	66.2	69.7	82.9	75.7	80.9	62.3	81.7	75.7	79.7	91.5
	Couple men																		
Age	42.6	41.4	43.5	46.9	43.4	45.4	43.9	45.3	42.9	43.5	43.8	47.7	41.3	43.3	41.8	47.1	44.0	42.8	45.0
# of children	0.69	0.79	0.79	0.46	0.68	0.66	0.69	0.70	0.78	1.27	0.70	0.42	0.76	0.60	0.70	0.63	0.63	0.85	0.02
Pred. wage	20.1	39.7	9.7	21.1	5.4	8.9	13.1	44.9	21.5	13.1	6.5	4.9	26.1	3.1	11.1	37.7	15.8	21.7	4.7
Weekly hours	39.0	33.2	32.9	35.4	36.8	34.0	35.5	36.3	35.9	33.0	34.8	34.0	37.3	35.6	37.2	34.9	34.2	36.9	35.0
Part. rate	90.9	79.8	81.3	84.0	89.4	74.7	85.7	89.6	87.2	82.2	87.5	83.9	85.4	87.4	87.3	90.4	78.8	88.1	83.9

Table 3.2: Average observed and predicted hours of work

Country	AT	BE	CY	DE	EE	EL	ES	FR	FI	IE	IT	LT	LU	LV	MT	NL	PT	SI	SK
	Single women																		
Observed	32.24	25.52	31.76	30.77	37.55	21.52	22.69	31.76	32.4	18.68	27.48	33.36	29.96	35.55	18.55	23.85	31.07	34.08	36.15
Predicted	31.52	26.37	33.96	30.54	38.54	21.05	21.45	32.46	32.67	18.26	28	33.27	29.5	35.25	17.45	23.47	33.43	34.89	35.93
Gap %	-2.23	3.33	6.93	-0.75	2.64	-2.18	-5.46	2.20	0.83	-2.25	1.89	-0.27	-1.54	-0.84	-5.93	-1.59	7.60	2.38	-0.61
	Single men																		
Observed	35.65	30.61	31.6	32.97	37.15	32.87	28.25	29.74	35.45	21.85	28.41	29.06	34.72	34.72	35.62	31.58	31.12	34.79	34.3
Predicted	38.61	35.18	32.8	32.63	38.31	33.17	29.71	32.37	35.36	21.85	28.46	31.4	33.46	34.84	36.96	31.22	31.52	34.88	33.83
Gap %	8.30	14.93	3.80	-1.03	3.12	0.91	5.17	8.84	-0.25	0.00	0.18	8.05	-3.63	0.35	3.76	-1.14	1.29	0.26	-1.37
	Couple women																		
Observed	27.0	25.5	24.9	26.0	31.2	20.0	26.4	32.6	31.4	21.9	23.4	31.3	26.3	30.3	23.5	23.6	29.9	31.6	28.2
Predicted	27.2	25.3	25.4	26.7	32.5	20.3	27.0	33.5	31.4	21.8	23.7	30.9	26.9	31.9	24.6	23.9	30.6	31.4	28.1
Gap %	0.9	-0.7	2.0	2.8	4.0	1.6	2.2	2.7	0.1	-0.5	1.3	-1.2	2.1	5.3	4.6	1.2	2.3	-0.5	-0.2
	Couple men																		
Observed	36.5	32.8	32.8	33.1	36.4	31.4	34.1	35.1	35.6	32.8	34.6	33.1	35.2	35.0	35.8	35.1	33.5	35.6	34.6
Predicted	36.4	33.1	32.8	34.7	37.8	32.0	34.3	36.2	35.6	33.1	34.6	32.7	35.0	36.8	35.6	36.0	33.7	35.4	34.6
Gap %	-0.3	0.9	0.0	4.7	3.8	1.9	0.6	3.2	0.1	0.7	0.2	-1.2	-0.8	5.0	-0.8	2.7	0.4	-0.5	0.2

almost perfectly fits the data both for men and women in many countries. There are some exceptions like single women in Portugal, Italy and Spain or single men in Spain and Lithuania for which the discrepancy is relatively high (around 5%). For couples, the fit is much better than for singles in every country. Overall the model performs relatively well in predicting observed labour supplies.

3.4.2 Elasticities

Another way to interpret the parameters of the model is to look at the labour supply elasticities. Since the labour supply model is nonlinear, elasticities cannot be derived analytically but can be calculated by numerical simulations using the estimation results. This is done by simulating the impact of a marginal increase in income on hours of work and participation. The labour supply elasticities provide a first insight into behavioural response to change in the household income and they will be useful in determining the impact of reforms over countries.

We present both wages and income (unearned income) elasticities. In particular, we predict the change in average working hours after a common uniform increase

of 1% in net wages (or unearned income)[13]. For couple, cross-wage elasticities are obtained by simulating changes in individual hours when the spouse wage rates are increased. Usually the literature focuses on women labour supply because women participation is lower and working hours are more variable than men's. Men's labour supply is found to be very inelastic to small exogenous changes in the budget constraint.

Figures 3.1 displays own-wage elasticities[14]. Overall, the results are in line with previous estimations [see Blundell et al., 2000, Bargain et al., 2014]. Elasticities for single women tends to be less concentrated than for other subgroups, they range from -0.62 to 0.46, for Greece and Belgium respectively but for most countries it is at around 0.10. Single men show more concentrated elasticities, in a range from -0,16 for Greece to 0,49 for Belgium. Net wages elasticities are particularly high in Belgium, Spain, and Italy for single men. Wage elasticities for women in couple ranges between -0.41 for Belgium to 0.36 for the Netherlands. Apart for the Netherlands, Belgium, and Italy which shows higher elasticities, differences across countries are low, as shown by **?**. Married women are largely studied in the literature and it is common results to find higher elasticities for them than men in couple. For men in couple, results are a little bit more compressed, with own-wage elasticities ranging between -0.3 and 0.28. Figure 3.2 displays cross-wage elasticities for couples. They are smaller in absolute value than own-wage elasticities and they are smaller and less disparate across countries for men than for women. Finally Figure 3.3 presents income elasticities. For most countries, cross-wage elasticities are negative. As often, income elasticities are very small and close to zero, even though they are in a larger order of magnitude for single individuals (particularly single men) than couple. They are negative for a lot of countries.

[13]We find similar elasticities with an increase of 10%.

[14]Tables A.12 and A.13 in the appendix present fully detailed estimations of the elasticities.

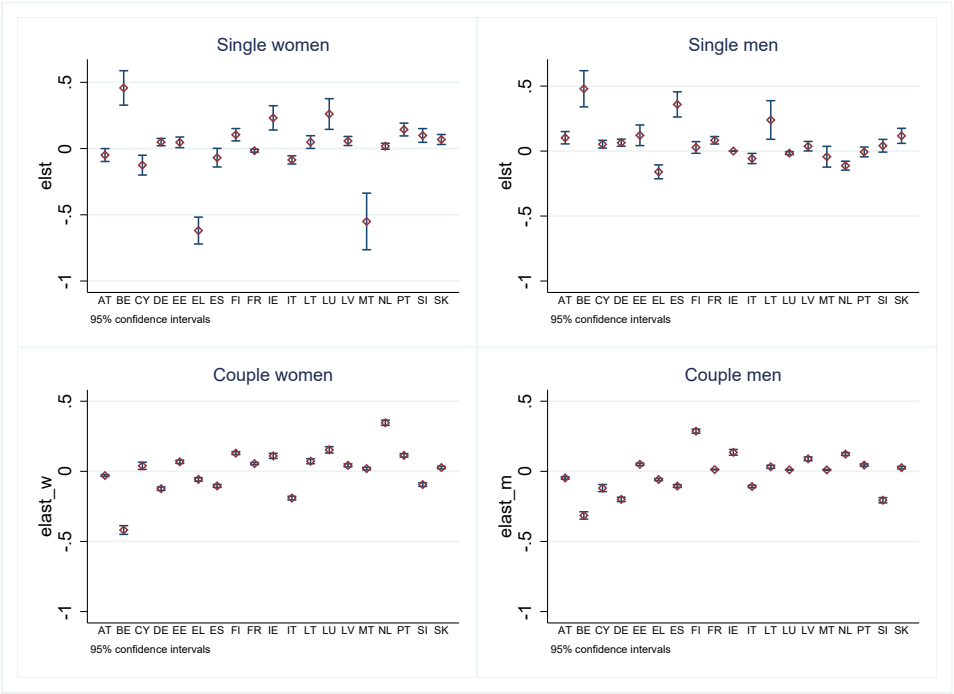


Figure 3.1: Own-wage elasticities

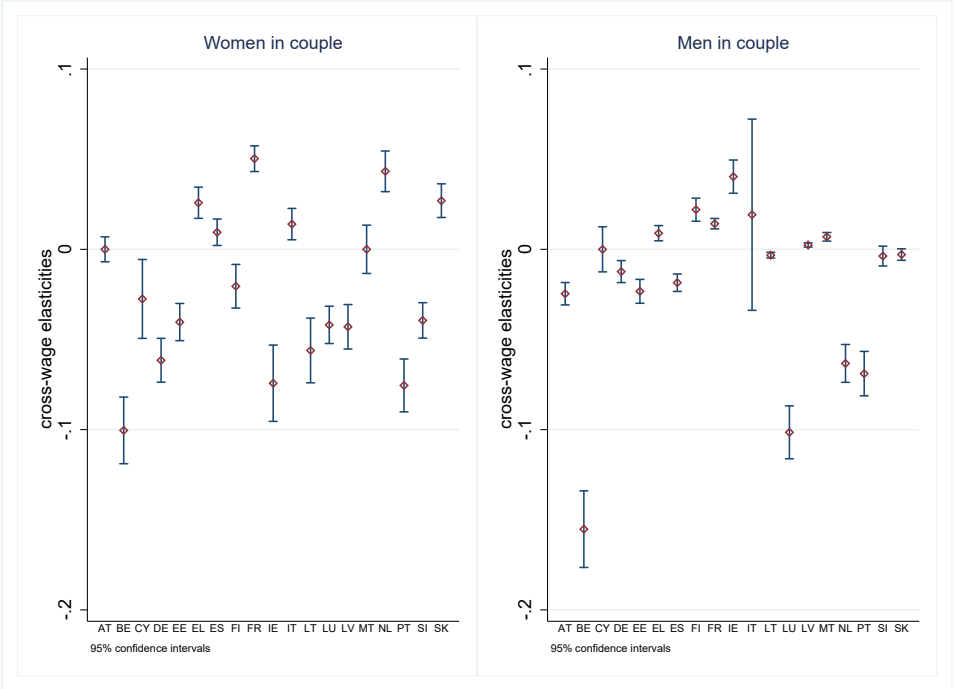


Figure 3.2: Cross-wage elasticities

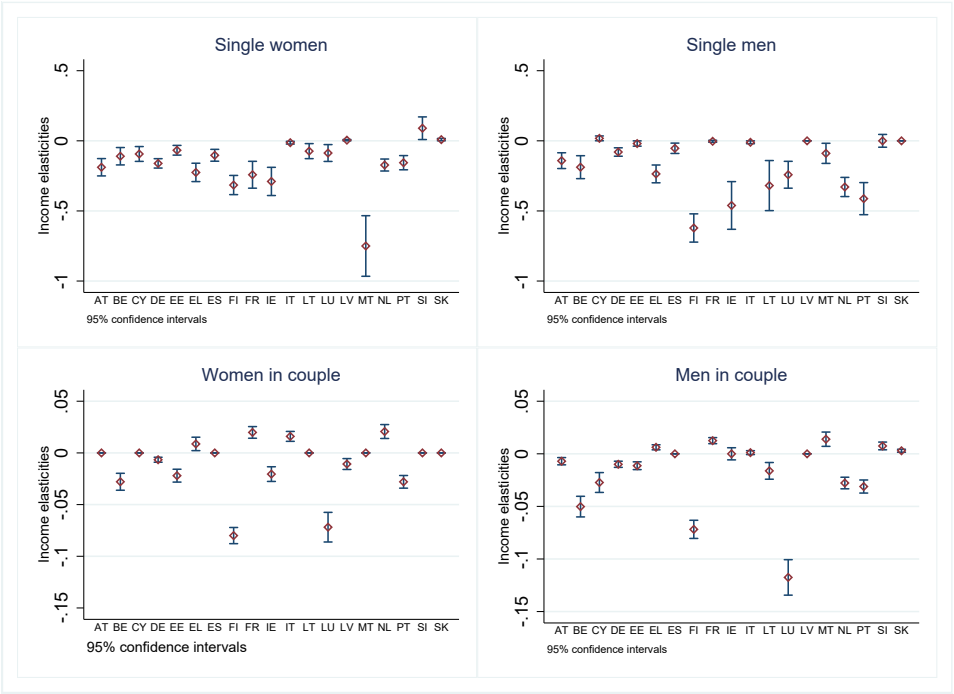


Figure 3.3: Income elasticities

3.5 Employment effects of an EMU-UI

Our empirical framework is used to study how the different scenarios of reform might impact labour supply and employment. Figures 3.4 to 3.6 present the effect of each scenario on the non-participation rates, the share of full-time equivalent workers and the mean hours of work in each country respectively. The variation is calculated taking the situation before the reform as the baseline[15].

We find strong differences across countries and between scenarios of reform. Overall, the results show that the implementation of an EMU-UI would have a strong disincentive effect to work in Portugal, Belgium, Lithuania and Greece for both single and couple individuals. On the contrary, the EMU-UI would have low or no impact on labour supply in Austria, Finland, Luxembourg, Slovenia, Slovakia.

In particular the effect of the reforms differs according to gender and marital status. For example in Greece and Italy, we find much stronger labour supply reaction for both single and in couple women. This is especially true for the *flat-rate EMU-UI* (Scenario 3), for which we find stronger reaction for women than for men in a majority

[15]In the appendix, Tables A.14 and A.15 present the variation of FTE in percentage for each scenario. Table A.16 presents the variation in the labour force participation and Table A.17 presents the change in the average means hours worked.

of countries. The resulting impact can be explained by the difficulty for women to obtain subsequent unemployment benefits without floor amount. For example, in Italy, the share of women working part-time tends to be high. For single individuals, most reforms affect only women in Slovenia and Slovakia. On the contrary, the labour supply reaction is stronger for single men than women in Belgium, Spain, Lithuania and Portugal.

Looking at each scenario separately, we see that the *basic EMU-UI* (Scenario 1) does not imply much changes in labour market participation and hours of work except in Belgium and Portugal. There is no labour supply reactions in Austria, Germany, Estonia, Finland, Slovenia,and Slovakia. While we find an increase of the non-participation rate at around 0.1-0.2 p.p. in most countries, it increases by around 0.7 p.p. and 0.9 p.p. in Belgium and Portugal respectively (see Appendix A.16). In this scenario, it appears that the introduction of an EMU-UI increases the generosity of unemployment benefits for all unemployed in Portugal. Particularly, unemployment benefits almost double for Portuguese single men and consequently we observe an important reduction of the number of FTE for that category (-3.11%, see Appendix A.14)[16]. For the rest of the countries, we observe a small reduction in FTE which is mainly driven by single, especially single men here, who reduce their number of hours of work. With the introduction of the EMU-UI, the disposable income under unemployment is close to the income level under part-time employment which increase the relative utility of non working.

The *floor and ceiling EMU-UI* has a much more important effect on employment even if the impact remain low in most countries. Overall, the *floor and ceiling EMU-UI* induces an increase in non-participation rates in almost all countries, except for Austria, Finland, and the Netherlands. Compared to a *basic EMU-UI*, Lithuania, Greece and Malta are much affected by the introduction of the floor and ceiling.

The flat-rate benefit is rather different than the two first scenarios and introduces a flat-rate benefit. This reform has a much stronger impact on the labour supply and reduces the number of FTE in most countries. The drop is important in Belgium, , Greece, Lithuania, Latvia, Malta, the Netherlands. In particular, single individuals are strongly affected by the reform with a decrease of FTE around 1-2% for single men in many countries, going up to above 3% in Belgium, Lithuania, and Spain.

[16]Interestingly, most single individuals who change their labour supply are older than 50 and goes from full-time working to non-participation. This is true in many countries of the sample. Being closer to retirement thus has an impact which is not surprising given the important effect of the variable age in the labour supply model.

Single women are also affected with a decrease of about 1.5% in Belgium, Italy, Lithuania, Malta and the Netherlands. Couples are affected although less strongly, the strongest reaction is found for Latvia for both women and men in couple. This reform seems to imply strong distortions on labour markets in almost all Eurozone countries as for many countries. Overall, we can see from Figure 3.6 that the mean hours decrease by more than 0.25% in 6 Eurozone countries.

Finally, on top of these 3 different scenarios, the *full replacement EMU-UI* introduces a complete harmonisation of national UI systems and propose to implement a single EMU-UI which replaces national systems. The effect is rather different to what the three first reforms implied. We observe an increase of the labour supply in Belgium, Ireland, Italy, Lithuania and the Netherlands. This is mainly due do the reduction of the generosity of unemployment benefits under the EMU-UI compared to the national system. We can see from Figure 3.4 that the non-participation rates decrease in Ireland, Lithuania, Italy and the Netherlands at around 0.2-0.5 percentage points. These countries have quite generous benefits. However, the EMU-UI is still more generous than the national system in certain countries and thus Scenario 4 also implies negative labour supply response in Luxembourg, Greece, Malta and Portugal.

Thus the EMU-UI seems to affect countries differently. However Belgium, Greece, Lithuania, Malta, and Portugal are the five countries for which there are considerable variations in labour supply. The reasons of such an impact are different according to the country. In Portugal, for example, we observe a high increase in generosity of benefits for all unemployed, especially for single men. Most single individuals who change their labour supply in our simulations go from full-time to non-participation and are older than 50 year old. This age effect is also observed in Belgium and Lithuania for which we find a decrease in labour supply mainly for single men above 50 years old. In Cyprus, which is also affected by the three scenarios, we find that many women with young children and working part-time decrease their labour supply. Women in couple who changed their working hours have more children and their partner's earnings tend to be higher compared to women who did not change their labour supply after the reform. We also observe the same mechanism for Malta. We find very strong labour supply reduction in Belgium, especially for single men for which the EMU-UI tends to increase a lot their disposable income. As said before, we also observe an age effect. The share of older unemployed in Belgium tends to be high, which is confirmed here as many of individuals who reduce their working

hours are above 50 years old. This drop in labour supply could also be explained by the entitlement conditions to access to national UI which tends to be relatively strict in Belgium and are now relaxed with EMU-UI. Even though the duration and replacement rate of UI benefit in Belgium are relatively generous, there is still individuals with low access to benefits leading to relatively high share of unemployed individual at risk of poverty in Belgium[17].

In summary, the proposal of a *basic EMU-UI* has few effects on the participation rate and the number of hours of work. The introduction of a *floor and ceiling EMU-UI* has also little impact and does not induce important labour supply reactions. On the contrary, the *flat-rate EMU-UI* leads to greater disincentive to work and we can expect such a reform to have quite strong labour market distortions effects. This is exemplified by the reduction in mean hours which is at -0.61% for the EMU-average under the *flat-rate EMU-UI* , while it as at -0.53% and -0.23% for *floor and ceiling EMU-UI* and *basic EMU-UI* respectively. The potential advantage of the *floor and ceiling EMU-UI* in comparison to a *basic EMU-UI* is that it is designed to be more redistributive and could contribute more to upward convergence in terms of social protection of workers between countries. The replacement of national system by a *full substitution EMU-UI* has slight increase or no effect on labour supply. However since the EMU-UI scheme is less generous than national UI in several countries, it may have redistributional implications, as we are going to see in the next Section.

3.6 Effects of an EMU-UI on poverty and inequality

We next look at the distributional effect of these four reform scenarios. To do so, we focus on two measures: the Gini index and the standard headcount poverty rate estimated at a threshold of 60% of median equivalised disposable incomes. Similarly to the previous section on labour supply, we compare the four scenarios to a baseline. In the following, we present the total effects but Tables A.18 and A.19 present also the effects of the three reforms on the Gini index for single women, single men, and couples respectively.

[17]In 2018, the share of individual at risk of poverty (AROP) while unemployed was at 50.6% for Belgium, which is above the EMU average. See Eurostat data: At-risk-of-poverty rate by poverty threshold and most frequent activity in the previous year - EU-SILC and ECHP surveys. https://ec.europa.eu/eurostat/cache/metadata/en/ilc_esms.htm

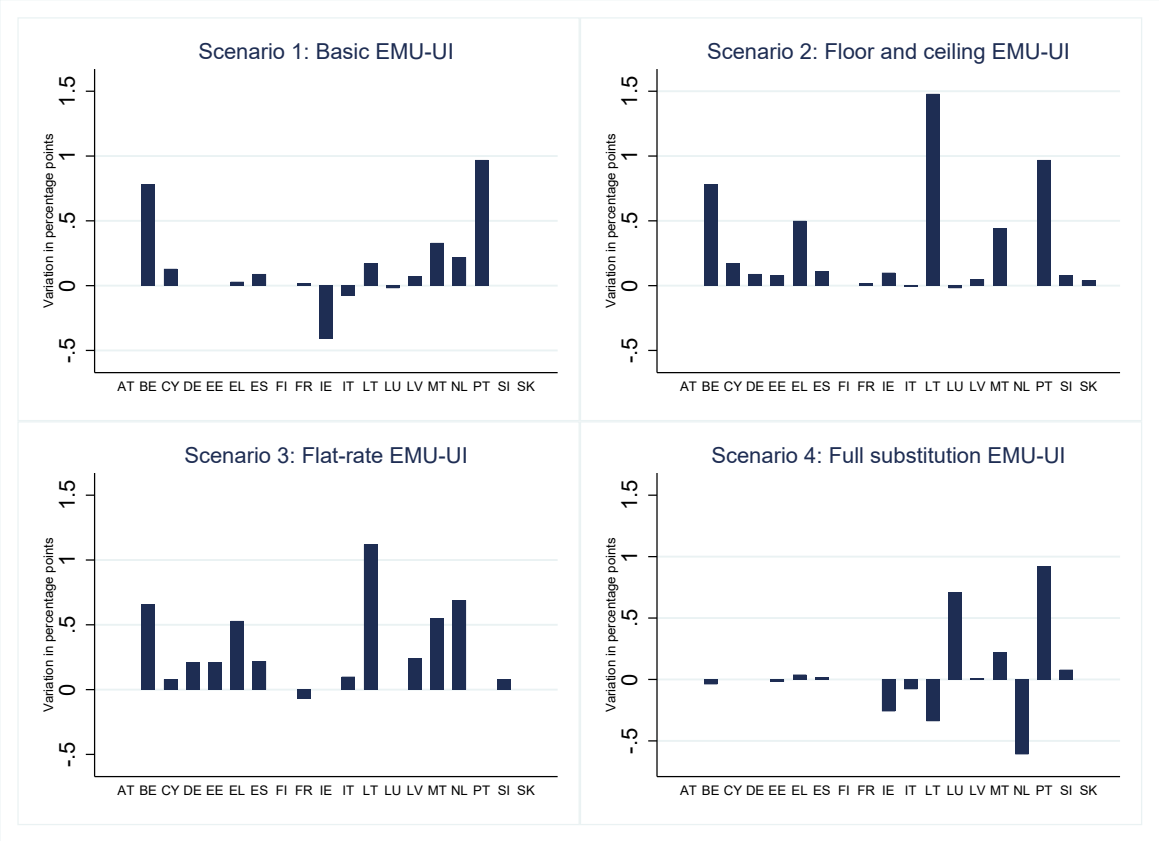


Figure 3.4: Effects of the reforms on the extensive margin

Figure 3.7 and 3.8 show the variation in percentage of the poverty rate and the Gini index for the introduction of each scenario compared to the baseline. The *basic EMU-UI* (scenario 1) implies a reduction of poverty in almost all countries (13 out of 19 countries), exception made for Spain, and Malta for which we observe a slight increase in poverty rates. In Estonia, Spain, France, Lithuania, Luxembourg, and Slovenia, we observe a very small poverty variation. We find a substantial reduction in poverty under this *basic EMU-UI* in Belgium,, Italy, and Portugal with a noticeable -0.75 percentage points decrease in Belgium. Under the *floor and ceiling EMU-UI*, we observe a more important poverty reduction effect that affects many more countries than the basic scenario. Overall, a *floor and ceiling EMU-UI* implies a reduction in poverty rates in all countries except Austria, Finland, Italy and Slovenia. The effect of the *flat-rate EMU-UI* on poverty is similar to the *floor and ceiling* scenario but the poverty reduction tends to be slightly more important for the Netherlands, Latvia and Germany. Otherwise, the poverty drop remains broadly the same. Not surprisingly, a *full substitution EMU-UI* shows opposite effects in

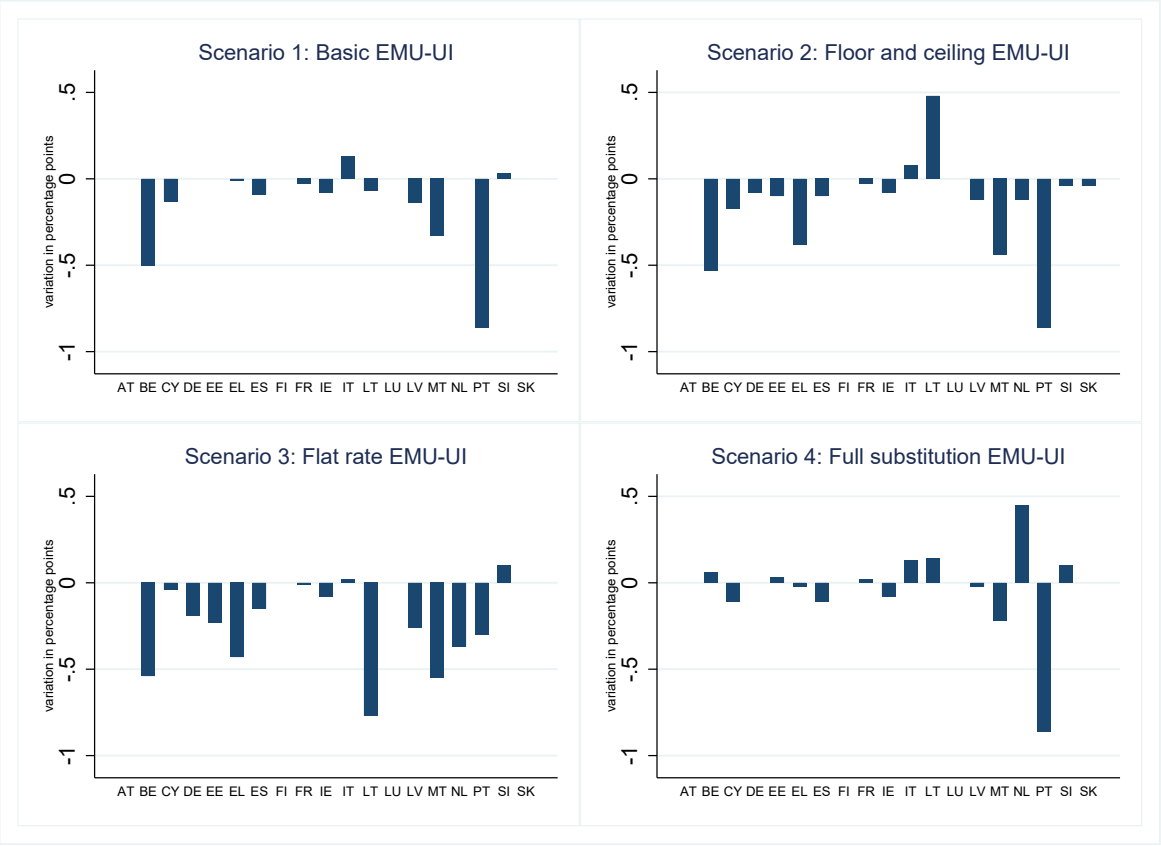


Figure 3.5: Effects of the reforms on the share of full-time workers

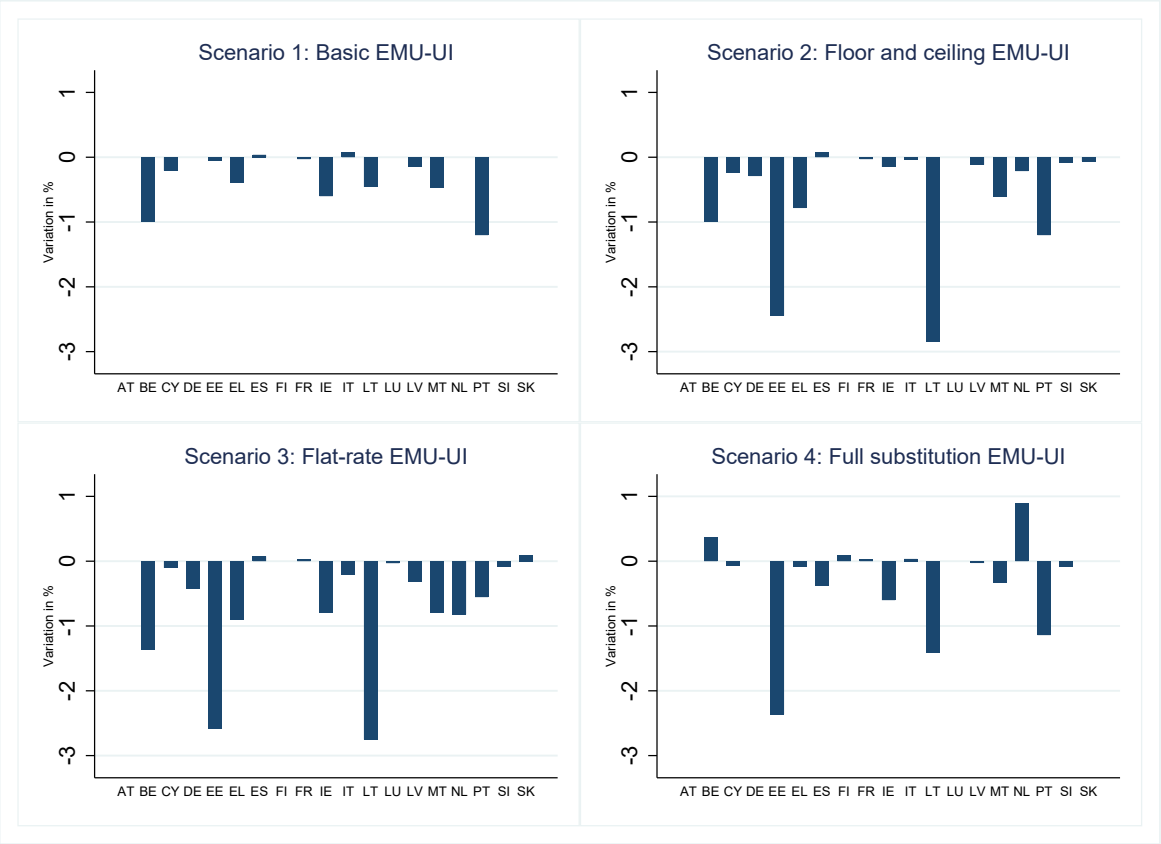


Figure 3.6: Effects of the reforms on mean hours worked

many countries. The poverty rates increase in seven countries, although the change being small, except for Finland, France and Ireland. However, we still observe a poverty reduction in some countries, notably in Belgium, Italy, and Portugal. This means that the basic EMU-UI that we consider here tends to be on average more 'generous' than the national UI systems in those countries. It is indeed more efficient in tackling poverty.

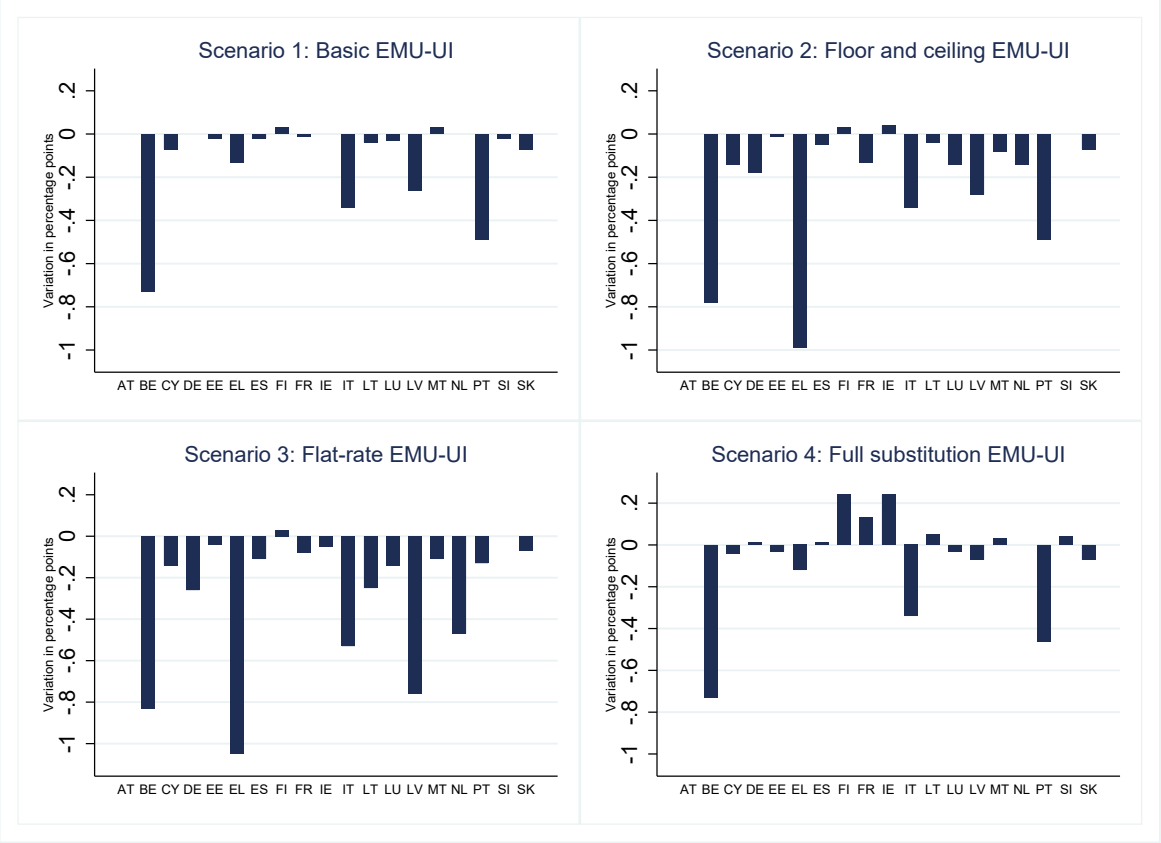


Figure 3.7: Poverty rates variation in percentage points

Figure 3.8 presents the variation in the Gini index. Overall, the income inequalities tends to decrease in the first three scenarios, with a more important drop in *floor and ceiling* and *flat-rate* scenarios. For the *basic EMU-UI*, we find a reduction of inequality in more than ten countries with a particularly strong effect in Belgium, Portugal and Italy. If we look at details, we see that this reduction is particularly high for single and especially in countries where the Gini index before the reform was high; i.e. in Belgium, Spain and Portugal. The reduction in Gini is stronger under *floor and ceiling EMU-UI* and we find a decrease in all countries except for Finland.

The drop is particularly high in Belgium, Spain, Greece and Italy with a decrease at around 15% for Belgium for example. In the *flat-rate EMU-UI*, the effect of the introduction of an EMU-UI is important and we observe a fall in income inequality of about 0.6-1% in several countries. Except Finland, Latvia, and Slovenia, all countries experience a reduction if inequality. Finally, *full substitution EMU-UI* leads to an increase in Gini coefficients in a series of countries. However, this scenario has still a negative effect on inequality in Italy, Portugal and Slovakia.

Overall, these four scenarios have divergent redistributive implications. A *basic EMU-UI* reduces poverty rates in several countries. It also reduces the inequality of income, as expressed by the Gini coefficient, in almost half of the Eurozone countries. However, a *floor and ceiling EMU-UI* implies much more reduction in poverty and inequalities and it affects many more countries and to a higher extent. The redistributive effects of the *flat-rate EMU-U*I are of the same magnitude as *floor and ceiling* alternative. This tends to show that a partially insurance-related benefit scheme with floors and ceilings implies broadly similar reduction in poverty and inequalities than a fully 'beveridgian' system with flat-rate EMU-UI.

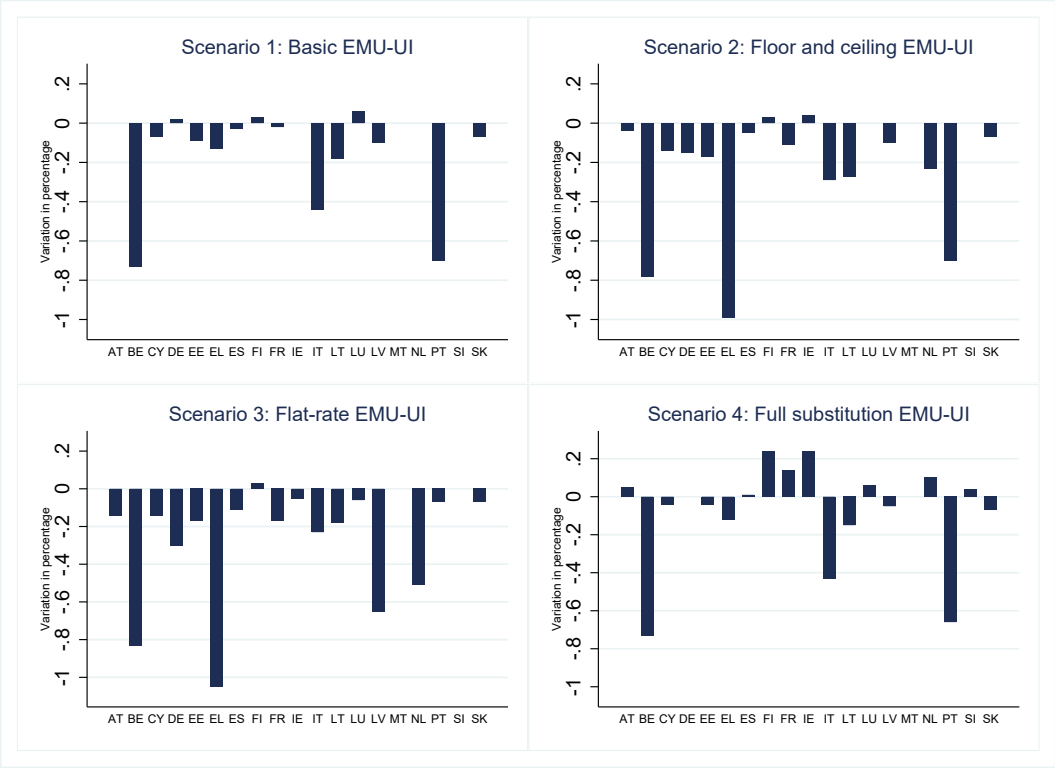


Figure 3.8: Change in Gini coefficient in percentage

3.7 Conclusion

This paper assesses the implication of an EMU-UI on the labour market and income distribution for the Eurozone countries. We simulate four scenarios of reform using EUROMOD for the year 2018 and estimate a structural discrete choice model of labour supply for both single and couples. The results show that introducing an EMU-UI would have heterogeneous effects regarding behavioural adjustment between countries. We show that the intensity of the labour supply reaction depends much on the marital status and gender, as in many countries, women in couple and single men tends to have stronger reactions to the reforms. Our results also show that introducing a common EMU-UI would decrease income inequalities and poverty in most countries. Countries characterised by quite unequal income distribution would benefit from EMU-UI, regardless of the design of this scheme. In particular, an EMU-UI would reduce income inequalities in Greece, Belgium, Spain and Portugal. We also find a significant drop in poverty rates after the reforms in Belgium, Greece, Italy and Portugal.

One important finding is that the characteristics of the EMU-UI regarding eligibility or the generosity of the benefits play a crucial role. A *flat-rate EMU-UI* inspired by a Beveridgian system would imply a high disincentive to work in many countries combined, with a high reduction in poverty and inequalities. A second scenario, the *floor and ceiling EMU-UI*, shows little disincentive to work, but it significantly helps fight the poverty of unemployed individuals. Thus we show that a flat-rate benefit would have too strong a negative labour supply effect even though this would perform well to reduce inequality and poverty. An EMU-UI with floor and ceiling would perform as well as the latter while inducing broadly similar labour market distortion as a fully insurance-based EMU-UI.

Despite the potential stabilisation property of an EMU-UI, the recent crises have shown the need for greater convergence between countries regarding social protection and inequality reduction. The recent Covid-19 crisis highlighted the need for greater protection of the unemployed against poverty. Many countries have taken measures during the crisis. Nine Eurozone countries have extended or raised the unemployment insurance payments to ensure a minimum sustainable replacement rate[18]. We observe today an increasing tendency of workers that have difficulty accessing a sufficient level of social protection, including unemployment benefits. In addition, the share of low-

[18]For more details, see Fana et al. [2020]

wage earners remains high in Europe (in 2018, 15.3% of employees were low-wage earners in the EU), meanings that these workers would have very low unemployment benefits revenues if the system were fully earning-related.

The European Pillar of Social Rights (EPSR) highlighted the need for greater social protection for all workers, having adequate unemployment benefits while not generating labour supply disincentives and reducing poverty rates in Europe. The recent Porto Social Summit held on the 7th of May 2021 rekindled the need for a common tool to consolidate a Social Europe. In this summit, EU leaders signed a commitment to set new targets for 2030, in line with the EPSR in which one of the objectives states that 'The number of people at risk of poverty or social exclusion should be reduced by at least 15 million, including at least 5 million children whereas in 2019, around 91 million persons were still at risk of poverty or social exclusion in the EU and almost half (48.7%) of unemployed persons were at risk of poverty after social transfers in 2016.

The EPSR also states, ' The unemployed have the right to [...] adequate unemployment benefits of reasonable duration, in line with their contributions and national eligibility rules. Such benefits shall not constitute a disincentive for a quick return to employment.' If policymakers want to meet the EPSR requirements regarding the reduction of poverty and improve unemployment benefit systems performance at protecting better workers while limiting the distortions on the labour market, our results show that it would be relevant to consider a *floor and ceiling EMU-UI* which allows greater performance in fighting poverty combined with limited labour supply reduction.

Appendix

The Heckman-corrected wage estimation

Table A.1: Wage estimation: women

	(AT)	(BE)	(CY)	(DE)	(EE)	(EL)	(ES)	(FI)	(FR)	(IE)	(IT)	(LT)	(LU)	(LV)	(MT)	(NL)	(PT)	(SI)	(SK)
Age	0.74**	0.23	0.06	0.36***	0.35***	0.06	0.23*	0.19*	0.02	0.12*	-0.23	0.39***	0.09	0.38***	0.49***	0.79***	-0.14	0.84***	0.49***
	(0.27)	(0.15)	(0.09)	(0.03)	(0.05)	(0.04)	(0.10)	(0.08)	(0.06)	(0.05)	(0.12)	(0.06)	(0.11)	(0.06)	(0.05)	(0.09)	(0.11)	(0.19)	(0.07)
Age squared	-0.02*	-0.01*	-0.00	-0.01***	-0.01***	-0.00	-0.01*	-0.00**	0.00	-0.00	0.00*	-0.01***	-0.00	-0.01***	-0.01***	-0.02***	0.00	-0.02***	-0.01***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Age cubic	0.00 *	0.00**	-0.00	0.00***	0.00***	0.00	0.00***	0.00**	-0.00	-0.00	-0.00	0.00**	0.00	0.00***	0.00***	0.00***	-0.00	0.00**	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High education	0.05	-0.35	0.71***	0.36***	0.49***	0.37***	0.09	0.19*	0.45***	0.71***	0.02	0.81***	0.47***	0.81***	0.45***	0.07	0.55***	-0.36	0.07
	(0.20)	(0.26)	(0.06)	(0.06)	(0.05)	(0.09)	(0.17)	(0.09)	(0.10)	(0.15)	(0.15)	(0.17)	(0.04)	(0.11)	(0.09)	(0.12)	(0.10)	(0.29)	(0.08)
Number of children	0.13	0.17	0.06*	-0.11*	-0.12***	0.04*	0.09*	0.08	-0.07***	-0.10*	0.13*	-0.15***	0.05	-0.11**	-0.06*	0.05	0.06	0.11	0.06
	(0.17)	(0.10)	(0.03)	(0.05)	(0.03)	(0.02)	(0.04)	(0.07)	(0.02)	(0.05)	(0.05)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.07)	(0.07)
# of children ¡2 y/o	0.08	-0.17	-0.12	-0.39***	-0.56***	0.01	0.01	0.06	-0.68***	-0.15	-0.13	-0.81***	-0.06	-0.96***	-0.08	0.04	-0.11	-0.31	0.34
	(0.52)	(0.16)	(0.07)	(0.07)	(0.12)	(0.05)	(0.09)	(0.10)	(0.08)	(0.08)	(0.11)	(0.23)	(0.08)	(0.14)	(0.07)	(0.08)	(0.08)	(0.18)	(0.18)
In couple	-0.03	-0.18	0.35***	0.12**	0.01	0.07*	0.20**	0.01	0.17***	0.20***	0.26*	-0.04	0.12**	-0.09*	0.06	0.04	0.03	0.13	-0.00
	(0.16)	(0.15)	(0.04)	(0.04)	(0.03)	(0.04)	(0.07)	(0.06)	(0.05)	(0.06)	(0.10)	(0.05)	(0.04)	(0.04)	(0.05)	(0.06)	(0.03)	(0.12)	(0.05)
_cons	-5.45*	1.24	-0.51	-3.49***	-4.18***	-0.02	-1.29	-0.12	1.06	-0.75	6.72*	-6.00***	1.49	-5.41***	-4.94***	-8.68***	3.63	-9.06***	-4.34***
	(2.49)	(2.65)	(1.36)	(0.53)	(0.84)	(0.71)	(1.73)	(1.28)	(0.54)	(0.69)	(2.72)	(1.02)	(1.78)	(0.88)	(0.58)	(0.88)	(1.98)	(1.79)	(0.87)
select																			
Age	-0.17*	0.25***	0.63***	0.08	0.25***	0.12**	0.31***	0.20***	-0.21***	0.07	0.24***	-0.03	0.62***	0.11	0.17*	-0.21***	0.42***	-0.29***	-0.08
	(0.07)	(0.07)	(0.07)	(0.05)	(0.06)	(0.04)	(0.04)	(0.05)	(0.05)	(0.06)	(0.03)	(0.07)	(0.08)	(0.06)	(0.08)	(0.05)	(0.05)	(0.05)	(0.06)
Age squared	0.01***	-0.00*	-0.01***	-0.00	-0.00*	-0.00	-0.01***	-0.00*	0.01***	-0.00	-0.00***	0.00	-0.01***	-0.00	-0.00	0.01***	-0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age cubic	-0.00***	0.00	0.00***	-0.00	0.00	-0.00*	0.00***	-0.00	-0.00***	-0.00	0.00	-0.00*	0.00***	-0.00	0.00	-0.00***	0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High education	0.23***	0.66***	0.48***	0.34***	0.43***	0.65***	0.59***	0.32***	0.57***	0.67***	0.33***	0.75***	0.08	0.58***	1.10***	0.48***	0.41***	0.67***	0.32***
	(0.05)	(0.05)	(0.06)	(0.04)	(0.05)	(0.03)	(0.03)	(0.04)	(0.04)	(0.05)	(0.03)	(0.06)	(0.06)	(0.05)	(0.08)	(0.04)	(0.04)	(0.04)	(0.05)
# children < 2 y/o	-0.63***	0.04	0.07	-0.29***	-0.72***	0.05	-0.08	-0.05	-0.30***	-0.08	0.15**	-0.68***	-0.33**	-0.60***	-0.26*	-0.09	0.11	-0.12	-0.57***
	(0.11)	(0.10)	(0.10)	(0.09)	(0.09)	(0.06)	(0.07)	(0.08)	(0.08)	(0.10)	(0.06)	(0.14)	(0.11)	(0.10)	(0.11)	(0.08)	(0.09)	(0.08)	(0.10)
# children < 6 y/o	-0.07	0.03	0.06	-0.11	-0.01	-0.00	-0.06	0.08	-0.00	-0.17**	-0.02	-0.05	-0.15	-0.12	-0.28**	-0.09	0.03	0.20**	-0.04
	(0.09)	(0.08)	(0.09)	(0.07)	(0.08)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)	(0.05)	(0.10)	(0.09)	(0.09)	(0.10)	(0.06)	(0.07)	(0.07)	(0.07)
# children < 12 y/o	-0.03	-0.01	-0.02	0.05	0.05	-0.00	-0.12*	0.01	0.10	-0.15**	-0.07	0.03	-0.13	-0.07	-0.26**	-0.05	0.08	0.03	0.14
	(0.09)	(0.08)	(0.09)	(0.07)	(0.08)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)	(0.05)	(0.10)	(0.09)	(0.09)	(0.09)	(0.05)	(0.06)	(0.07)	(0.08)
In couple	0.12*	0.29***	-0.19**	0.16***	0.13*	-0.23***	-0.16***	0.12**	0.19***	0.18***	-0.23***	0.10	-0.01	-0.05	-0.30***	0.16***	0.02	0.07	0.08
	(0.06)	(0.05)	(0.06)	(0.04)	(0.05)	(0.03)	(0.03)	(0.04)	(0.05)	(0.05)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.04)	(0.04)	(0.05)	(0.05)
Number of children	-0.18**	-0.22***	-0.12*	-0.22***	-0.24***	-0.03	-0.05	-0.27***	-0.09*	-0.10*	-0.08*	-0.09	-0.09	-0.05	-0.08	-0.09**	-0.16***	-0.15***	-0.32***
	(0.06)	(0.05)	(0.06)	(0.05)	(0.05)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)	(0.06)	(0.06)	(0.06)	(0.06)	(0.03)	(0.04)	(0.04)	(0.05)
Other income	-0.00	-0.00	-0.00***	-0.00	0.00	-0.00***	0.00	0.00	-0.00*	0.00	0.00	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
_cons	2.04*	-4.14***	-8.91***	-1.05	-3.43***	-2.92***	-4.26***	-2.77***	3.04***	-1.00	-4.46***	-0.23	-8.50***	-1.47	-1.42	3.52***	-6.05***	3.26***	-0.00
	(0.85)	(0.82)	(0.92)	(0.57)	(0.73)	(0.52)	(0.48)	(0.61)	(0.59)	(0.72)	(0.44)	(0.88)	(0.94)	(0.79)	(0.92)	(0.58)	(0.57)	(0.62)	(0.68)
/mills																			
lambda	-3.13*	-2.04**	0.04	0.08	0.52*	-0.24	-1.76**	-1.71**	0.25	0.91*	-1.67*	0.30	-0.58	0.93*	-0.08	-1.35*	-1.11*	-2.98**	-1.23**
	(1.51)	(0.74)	(0.20)	(0.39)	(0.26)	(0.19)	(0.55)	(0.54)	(0.43)	(0.39)	(0.71)	(0.54)	(0.35)	(0.44)	(0.20)	(0.55)	(0.47)	(0.94)	(0.39)
N	3385	3367	2868	7276	3879	10529	9334	6237	6443	3544	12206	2901	2668	3677	2711	7483	6737	5643	4153
pseudo R^2																			

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.2: Wage estimation: men

	(AT)	(BE)	(CY)	(DE)	(EE)	(EL)	(ES)	(FI)	(FR)	(IE)	(IT)	(LT)	(LU)	(LV)	(MT)	(NL)	(PT)	(SI)	(SK)
Age	0.21*	0.08	0.55***	0.27***	0.25***	0.03	0.20**	0.01	0.33***	0.10*	-0.23	0.36***	-0.01	0.43***	0.43***	0.58***	-0.02	0.75*	0.22
	(0.09)	(0.09)	(0.06)	(0.05)	(0.07)	(0.04)	(0.08)	(0.08)	(0.08)	(0.04)	(0.12)	(0.08)	(0.10)	(0.07)	(0.04)	(0.09)	(0.08)	(0.32)	(0.20)
Age squared	-0.00	-0.00	-0.01***	-0.01***	-0.01***	-0.00	-0.00*	-0.00	-0.01**	-0.00	0.00*	-0.01***	-0.00	-0.01***	-0.01***	-0.01***	0.00	-0.02*	-0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Age cubic	0.00	0.00	0.00***	0.00**	0.00**	-0.00	0.00	0.00	0.00**	0.00	-0.00	0.00***	0.00	0.00***	0.00***	0.00***	0.00	0.00	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High education	0.38***	0.10	0.45***	0.30***	0.39***	0.40***	0.30**	0.07	0.12	0.44***	0.02	0.42***	0.46***	0.60***	0.42***	0.23**	0.48***	-0.64	-0.01
	(0.06)	(0.11)	(0.06)	(0.06)	(0.05)	(0.04)	(0.10)	(0.11)	(0.17)	(0.08)	(0.15)	(0.10)	(0.06)	(0.08)	(0.11)	(0.09)	(0.08)	(0.60)	(0.17)
Number of children	0.00	0.03	-0.03	0.01	-0.05*	-0.00	0.02	0.05	-0.02	0.07**	0.13*	-0.07*	-0.01	-0.01	-0.02	0.06	0.05	0.04	0.14
	(0.04)	(0.04)	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.04)	(0.02)	(0.02)	(0.05)	(0.03)	(0.03)	(0.02)	(0.03)	(0.04)	(0.03)	(0.13)	(0.13)
# of children <2y/o	0.14	-0.03	0.04	0.06	0.13*	0.03	0.10	-0.12	-0.15	0.05	-0.13	0.11	0.05	0.11	-0.02	-0.02	-0.11	-0.42	0.07
	(0.11)	(0.10)	(0.07)	(0.08)	(0.06)	(0.04)	(0.08)	(0.13)	(0.11)	(0.07)	(0.11)	(0.13)	(0.10)	(0.08)	(0.07)	(0.12)	(0.08)	(0.43)	(0.17)
In couple	0.05	-0.15	0.08	-0.03	0.04	0.13**	0.04	-0.18	-0.20	0.13	0.26*	0.27*	-0.07	0.12	0.12*	-0.13	-0.18	-0.51	-0.09
	(0.12)	(0.14)	(0.09)	(0.10)	(0.10)	(0.05)	(0.11)	(0.14)	(0.15)	(0.12)	(0.10)	(0.12)	(0.10)	(0.11)	(0.06)	(0.20)	(0.14)	(0.45)	(0.22)
_cons	-0.45	2.41	-6.52***	-1.45**	-2.15*	0.80	-1.72	2.83*	-1.71*	0.45	6.72*	-4.16***	3.32*	-5.03***	-4.11***	-5.74***	2.30	-5.63	-0.24
	(0.94)	(1.69)	(0.63)	(0.50)	(1.06)	(0.68)	(1.33)	(1.16)	(0.84)	(0.56)	(2.72)	(1.22)	(1.64)	(1.13)	(0.50)	(0.84)	(1.55)	(3.12)	(3.64)
select																			
Age	-0.15*	0.20**	-0.24***	-0.08	0.45***	0.21***	0.31***	0.04	-0.11*	0.05	0.24***	0.27***	0.44***	0.29***	0.00	-0.12*	0.29***	-0.05	0.28***
	(0.07)	(0.06)	(0.07)	(0.04)	(0.06)	(0.04)	(0.04)	(0.05)	(0.04)	(0.06)	(0.03)	(0.07)	(0.08)	(0.07)	(0.07)	(0.05)	(0.04)	(0.05)	(0.06)
Age squared	0.01**	-0.00	0.01***	0.00**	-0.01***	-0.00***	-0.01***	0.00	0.00**	-0.00	-0.00***	-0.01**	-0.01***	-0.01***	0.00	0.00**	-0.01***	0.00*	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age cubic	-0.00***	-0.00	-0.00***	-0.00***	0.00***	0.00	0.00***	-0.00***	-0.00***	-0.00	0.00	0.00*	0.00*	0.00**	-0.00	-0.00***	0.00**	-0.00***	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High education	-0.09	0.39***	0.38***	0.26***	0.44***	0.44***	0.44***	0.41***	0.59***	0.39***	0.33***	0.47***	0.08	0.44***	0.72***	0.19***	0.25***	0.41***	0.22***
	(0.05)	(0.05)	(0.06)	(0.04)	(0.07)	(0.03)	(0.03)	(0.05)	(0.04)	(0.05)	(0.03)	(0.07)	(0.07)	(0.08)	(0.08)	(0.04)	(0.05)	(0.05)	(0.06)
# of children <2 y/o	-0.07	0.08	0.11	-0.06	0.20	0.12	-0.11	0.14	0.07	0.01	0.15**	-0.34*	-0.13	0.33*	-0.04	0.12	0.11	0.18	0.05
	(0.12)	(0.11)	(0.12)	(0.10)	(0.13)	(0.07)	(0.08)	(0.10)	(0.09)	(0.11)	(0.06)	(0.17)	(0.14)	(0.16)	(0.13)	(0.10)	(0.10)	(0.09)	(0.10)
# of children <6 y/o	0.19	0.01	0.04	0.03	-0.01	0.05	-0.11	0.08	0.08	-0.20**	-0.02	-0.24*	0.11	0.12	-0.09	0.02	0.01	-0.02	-0.02
	(0.10)	(0.09)	(0.09)	(0.09)	(0.10)	(0.05)	(0.06)	(0.07)	(0.06)	(0.06)	(0.05)	(0.12)	(0.11)	(0.12)	(0.12)	(0.07)	(0.07)	(0.07)	(0.08)
# of children <12 y/o	0.11	-0.03	0.11	-0.01	0.10	0.03	-0.08	0.01	-0.00	-0.14*	-0.07	-0.13	0.05	0.16	-0.02	0.03	-0.01	0.06	-0.00
	(0.10)	(0.08)	(0.10)	(0.09)	(0.09)	(0.05)	(0.06)	(0.07)	(0.06)	(0.06)	(0.05)	(0.13)	(0.11)	(0.12)	(0.10)	(0.06)	(0.07)	(0.07)	(0.08)
In couple	0.36***	0.43***	0.48***	0.46***	0.79***	0.40***	0.42***	0.51***	0.45***	0.58***	-0.23***	0.52***	0.45***	0.52***	0.25***	0.49***	0.53***	0.26***	0.30***
	(0.06)	(0.06)	(0.08)	(0.04)	(0.06)	(0.04)	(0.04)	(0.05)	(0.05)	(0.06)	(0.03)	(0.07)	(0.08)	(0.06)	(0.07)	(0.04)	(0.04)	(0.05)	(0.06)
Number of children	-0.17**	-0.08	-0.03	-0.04	-0.11*	-0.07*	0.01	-0.11**	-0.02	0.02	-0.08*	0.08	-0.07	-0.08	-0.05	-0.11**	-0.06	-0.04	-0.16***
	(0.06)	(0.05)	(0.06)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.07)	(0.07)	(0.07)	(0.06)	(0.04)	(0.04)	(0.04)	(0.05)
Other income	-0.00	-0.00	-0.00***	-0.00*	0.00	-0.00***	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
_cons	2.39**	-3.43***	2.86***	0.87	-5.56***	-3.87***	-3.87***	-1.00	1.86***	-0.65	-4.46***	-3.29***	-6.00***	-3.29***	0.18	2.19***	-4.28***	0.85	-3.68***
	(0.84)	(0.79)	(0.83)	(0.55)	(0.74)	(0.47)	(0.46)	(0.60)	(0.53)	(0.72)	(0.44)	(0.87)	(0.93)	(0.83)	(0.82)	(0.56)	(0.55)	(0.58)	(0.68)
/mills																			
lambda	-1.36*	-1.29*	-0.50	-1.14**	-0.41	-0.34*	-1.20*	-2.23***	-1.98**	-0.03	-1.67*	-0.47	-1.23**	-0.07	-0.45	-1.86*	-1.16*	-6.91*	-2.20
	(0.64)	(0.54)	(0.27)	(0.43)	(0.31)	(0.15)	(0.48)	(0.57)	(0.64)	(0.33)	(0.71)	(0.46)	(0.46)	(0.51)	(0.40)	(0.91)	(0.48)	(3.28)	(1.33)
N	3262	3316	2563	6547	3756	10247	9099	6015	6687	3274	12206	2579	2712	3191	2804	6983	6160	5885	3846
pseudo R^2																			

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.3: Labour supply estimates: Single women

	(AT)	(BE)	(CY)	(DE)	(EE)	(EL)
Temp. choice						
Cx						
Age	-0.045	0.729*	2.242*	0.236*	-0.122	0.399
	(0.14)	(0.34)	(1.07)	(0.10)	(0.83)	(0.31)
Age squared	-0.006	-0.086*	-0.259*	-0.031*	0.034	-0.056*
	(0.02)	(0.04)	(0.11)	(0.01)	(0.14)	(0.04)
Number of children	-0.140	-0.116*	-0.050	-0.041*	0.028	-0.174
	(0.03)	(0.05)	(0.09)	(0.02)	(0.14)	(0.04)
_cons	-1.040*	-1.732	-8.482**	-0.917**	0.848	-3.822***
	(0.51)	(1.06)	(2.80)	(0.33)	(1.68)	(0.81)
CxC						
_cons	0.007***	0.007	0.036**	0.002	-0.039	-0.021*
	(0.00)	(0.00)	(0.01)	(0.00)	(0.03)	(0.01)
CxL1						
_cons	0.008***	0.003	0.019***	0.004*	0.002	-0.020***
	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
L1x						
Age	0.002	0.101	0.003	0.053	-0.115	-0.029
	(0.02)	(0.12)	(0.12)	(0.03)	(0.13)	(0.05)
Age squared	-0.002	-0.009	0.002	-0.006	0.016	0.003
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
Presence of children	-0.011	-0.035	0.022	0.013	0.010	0.005
	(0.02)	(0.02)	(0.03)	(0.01)	(0.03)	(0.01)
# of children <2 y/o	0.074**	0.020	0.059	0.017	0.108*	0.028
	(0.02)	(0.02)	(0.04)	(0.02)	(0.05)	(0.02)
# of children <6 y/o	0.012	0.011	0.017	0.023**	0.007	-0.000
	(0.01)	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)
Presence of elderly	0.042	0.034*	-0.003	0.027***	-0.032	0.006
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.00)
_cons	2.484***	2.957***	3.922***	2.194***	3.432***	1.377***
	(0.31)	(0.54)	(0.39)	(0.16)	(0.48)	(0.20)
L1xL1						
_cons	-0.010***	-0.012***	-0.016***	-0.009***	-0.012***	-0.006***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
IND						
fixed_cost	-9.014***	-9.107***	-15.521***	-8.441***	-8.985***	-8.955***
	(0.78)	(0.98)	(1.51)	(0.39)	(0.97)	(0.57)
sd_1						
_cons	-0.000	0.033	0.150***	0.003	-0.088*	0.005
	(0.01)	(0.01)	(0.04)	(0.01)	(0.04)	(0.04)
N	499	353	369	1512	453	923
pseudo R^2	0.413	0.240	0.502	0.279	0.516	0.321

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.4: Labour supply estimates: Single women

	(ES)	(FI)	(FR)	(IE)	(IT)	(LT)
Temp. choice						
Cx						
Age	1.123*	0.010	0.203	0.409	0.242	-1.374
	(0.43)	(0.14)	(0.27)	(0.21)	(1.11)	(0.78)
Age squared	-0.119**	0.007	-0.022	-0.042	-0.024	0.173
	(0.04)	(0.02)	(0.04)	(0.02)	(0.13)	(0.08)
Number of children	-0.039	0.068	-0.009	0.020	0.004	-0.026
	(0.03)	(0.04)	(0.08)	(0.01)	(0.02)	(0.26)
_cons	-2.266*	-0.851**	0.232	-0.422	-0.622	5.646
	(0.98)	(0.33)	(0.83)	(0.40)	(0.35)	(2.91)
CxC						
_cons	-0.001	0.004**	0.009***	-0.004	-0.001	-0.050
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)
CxL1						
_cons	0.000	0.004***	-0.006***	0.001	-0.000	-0.010
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
L1x						
Age	0.126	-0.081**	-0.047*	0.033	0.058	-0.038
	(0.09)	(0.03)	(0.02)	(0.08)	(0.03)	(0.07)
Age squared	-0.005	0.011**	0.007**	-0.001	-0.006	-0.147
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)
Presence of children	0.028	0.016	0.034***	0.006	0.010	0.007
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)
# of children <2 y/o	0.003	0.028	0.034**	0.010	-0.001	-0.028
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.03)
# of children <6 y/o	-0.022	-0.005	0.020*	0.014*	-0.002	-0.020
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Presence of elderly	0.023**	0.044***	0.005	0.004	-0.001	-0.025
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
_cons	2.764***	2.573***	3.059***	2.751***	-0.015	4.429***
	(0.34)	(0.18)	(0.14)	(0.43)	(0.12)	(0.38)
L1xL1						
_cons	-0.012***	-0.009***	-0.011***	-0.010***	-0.000	-0.015***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
IND						
fixed_cost	-10.298***	-8.480***	-8.866***	-8.821***	-0.393	-12.086
	(0.70)	(0.62)	(0.46)	(1.15)	(0.35)	(1.15)
sd_1						
_cons	-0.033***	-0.013	0.050	-0.000	-0.014	-0.103
	(0.01)	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)
N	798	654	1062	431	1505	229
pseudo R^2	0.278	0.312	0.372	0.326	0.007	0.448

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.5: Labour supply estimates: Single women

	(LU)	(LV)	(MT)	(NL)	(PT)	(SI)	(SK)
Temp. choice							
Cx							
Age	0.291*	-0.609	-0.609	0.190*	0.412	0.878	4.793
	(0.13)	(0.55)	(0.55)	(0.08)	(0.51)	(2.24)	(3792.33)
Age squared	-0.033*	0.040	0.040	-0.023**	-0.046	-0.109	-0.649
	(0.01)	(0.07)	(0.06)	(0.01)	(0.06)	(0.27)	(423.80)
Number of children	-0.008	0.055	0.006	0.025	0.007	0.278	-0.046
	(0.02)	(0.10)	(0.06)	(0.01)	(0.06)	(0.55)	(37236.84)
_cons	-0.690	4.054*	-5.367**	-0.744***	-2.911*	2.253	-4.295
	(0.38)	(1.73)	(1.64)	(0.23)	(1.46)	(4.54)	(8461.27)
CxC							
_cons	0.001	-0.050*	0.055***	0.001**	0.023	-0.144	-0.004
	(0.00)	(0.02)	(0.01)	(0.00)	(0.01)	(0.09)	(1.00)
CxL1							
_cons	0.001	-0.014*	0.043***	0.003**	0.015*	-0.012***	-0.000***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
L1x							
Age	0.036	-0.013	-0.243	0.066*	-0.070	-0.089	-0.030
	(0.07)	(0.06)	(0.16)	(0.03)	(0.10)	(0.05)	(0.07)
Age squared	-0.001	0.001	0.023	-0.006	0.010	0.011*	0.004
	(0.01)	(0.01)	(0.02)	(0.00)	(0.01)	(0.01)	(0.01)
Presence of children	0.004	0.003	-0.030	0.055***	0.011	0.035*	0.065**
	(0.02)	(0.02)	(0.03)	(0.01)	(0.02)	(0.02)	(0.02)
# of children <2 y/o	0.089*	0.041*	0.105*	0.016	-0.013	0.028	0.079
	(0.04)	(0.02)	(0.04)	(0.02)	(0.02)	(0.03)	(0.05)
# of children <6 y/o	0.004	0.026*	0.007	0.020	0.009	-0.014	0.017
	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.03)
Presence of elderly	0.053**	0.006	0.036***	0.052***	0.064***	-0.026*	-0.020
	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
_cons	2.216***	3.677***	1.574*	3.390***	2.355***	3.890***	4.383***
	(0.32)	(0.27)	(0.60)	(0.29)	(0.32)	(0.30)	(0.33)
L1xL1							
_cons	-0.009***	-0.013***	-0.006***	-0.013***	-0.009***	-0.013***	-0.016***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
IND							
fixed_cost	-7.770***	-11.686***	-13.350***	-11.573***	-10.857***	-11.941***	-14.572***
	(0.87)	(0.71)	(1.31)	(0.83)	(0.68)	(0.97)	(1.14)
sd_1							
_cons	0.000	-0.001	-0.001	-0.000	0.063**	-0.000	0.000
	(0.00)	(0.02)	(0.01)	(0.00)	(0.02)	(0.07)	(21.47)
N	283	577	290	1164	682	311	1268
pseudo R^2	0.318	0.458	0.541	0.307	0.309	0.499	0.636

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.6: Labour supply estimates: Single men

	(AT)	(BE)	(CY)	(DE)	(EE)	(EL)
Temp. choice						
Cx						
Age	0.002	-0.000	0.002	0.000	0.014	0.003
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
Age squared	-0.000	0.000	-0.000	-0.000	-0.001	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Number of children	-0.009	0.001	-0.000	-0.000	0.001	0.004
	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
_cons	-0.020*	0.002	-0.014	-0.005	0.021	-0.044**
	(0.01)	(0.02)	(0.01)	(0.00)	(0.02)	(2.95)
CxC						
_cons	0.000*	0.000	0.000	0.003	-0.000	0.000*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CxL1						
_cons	0.000*	0.000	0.000	0.004*	-0.000	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L1x						
Age	-0.056	-0.154	0.006	-0.004	0.339	0.009
	(0.08)	(0.21)	(0.15)	(0.03)	(0.25)	(0.02)
Age squared	0.006	0.024	-0.002	0.002	-0.035	-0.000
	(0.01)	(0.03)	(0.02)	(0.00)	(0.03)	(0.01)
Number of children	-0.492	-0.001	-0.060	-0.060	-0.057	-0.014
	(0.39)	(0.06)	(0.22)	(0.06)	(0.13)	(0.03)
Presence of elderly	0.021	0.008	0.045***	0.005	0.007	0.051
	(0.03)	(0.02)	(0.01)	(0.01)	(0.02)	(0.11)
_cons	2.428***	3.851***	2.366***	2.601***	2.784***	1.003***
	(0.31)	(0.94)	(0.48)	(0.17)	(0.54)	(0.26)
L1xL1						
_cons	-0.009***	-0.013***	-0.009***	-0.010***	-0.012***	-0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
IND						
fixed_cost	-9.958***	-11.021***	-10.262***	-11.753***	-9.165***	-8.993***
	(0.90)	(1.26)	(1.28)	(0.55)	(1.05)	(0.60)
sd_1						
_cons	0.000*	0.001**	0.000	-0.000	0.032	-0.000
	(0.00)	(0.02)	(0.00)	(0.01)	(0.06)	(0.06)
N	444	280	172	1003	267	782
pseudo R^2	0.366	0.294	0.329	0.353	0.404	0.236

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.7: Labour supply estimates: Single men

	(ES)	(FI)	(FR)	(IE)	(IT)	(LT)
Temp. choice						
Cx						
Age	0.217	0.210	-0.551	-1.416	0.256	0.239
	(0.30)	(0.21)	(0.34)	(0.87)	(0.19)	(1.55)
Age squared	-0.020	-0.017	0.074	0.144	-0.027	-0.037
	(0.02)	(0.02)	(0.04)	(0.09)	(0.02)	(0.16)
Number of children	-0.049	-0.030	0.144	0.141	0.026	-1.397
	(0.10)	(0.07)	(0.13)	(0.15)	(0.07)	(1.22)
_cons	-0.432	-2.417***	1.822***	3.885	-0.350	0.662
	(0.81)	(0.66)	(0.70)	(2.52)	(0.40)	(4.50)
CxC						
_cons	0.001	0.008**	0.001	0.000	-0.002	0.000
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.05)
CxL1						
_cons	0.001	0.012***	-0.006***	0.001	-0.001	0.001
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.02)
L1x						
Age	-0.097	-0.079	0.031	-0.410	0.056	0.054
	(0.09)	(0.05)	(0.02)	(0.33)	(0.04)	(0.12)
Age squared	0.017	0.012	-0.002	0.047	-0.006	-0.006
	(0.01)	(0.01)	(0.00)	(0.04)	(0.01)	(0.01)
Number of children	-0.026	-0.058	0.019	-0.028	0.021	-0.312
	(0.06)	(0.05)	(0.01)	(0.10)	(0.03)	(0.23)
Presence of elderly	-0.004	0.007	-0.007	-0.030	-0.006	0.001
	(0.01)	(0.02)	(0.01)	(0.03)	(0.00)	(0.01)
_cons	2.563***	1.853***	3.115***	3.811**	-0.056	2.837***
	(0.35)	(0.27)	(0.14)	(1.38)	(0.13)	(0.63)
L1xL1						
_cons	-0.009***	-0.007***	-0.012***	-0.010**	-0.000	-0.011***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
IND						
fixed_cost	-8.620***	-8.358***	-10.958***	-9.906***	0.071	-9.263***
	(0.71)	(0.69)	(0.56)	(1.83)	(0.39)	(1.60)
sd_1						
_cons	0.034*	0.050***	0.019	0.048	0.021	0.001
	(0.01)	(0.01)	(0.06)	(0.03)	(0.01)	(0.03)
N	457	615	854	205	1231	107
pseudo R^2	0.205	0.238	0.464	0.330	0.003	0.292

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.8: Labour supply estimates: Single men

Temp. Choice	(LU)	(LV)	(MT)	(NL)	(PT)	(SI)	(SK)
Cx							
Age	0.306	-0.157	-0.494	0.089	-0.820	2.154	1.136
	(0.22)	(0.81)	(0.59)	(0.11)	(0.55)	(2.23)	(580.24)
Age squared	-0.032	0.010	0.054	-0.010	0.085	-0.203	-0.139
	(0.03)	(0.09)	(0.07)	(0.01)	(0.06)	(0.26)	(62.36)
Number of children	0.004	0.183	-0.211	0.028	-0.026	-0.077	0.000
	(0.07)	(0.39)	(0.38)	(0.05)	(0.16)	(.)	(.)
_cons	-0.999	3.069	-8.063***	-1.143***	-3.083*	1.147	-1.934
	(0.67)	(2.70)	(2.31)	(0.30)	(1.56)	(4.51)	(1386.68)
CxC							
_cons	0.000	-0.018	0.076***	0.002***	0.052***	-0.330*	-0.002
	(0.00)	(0.03)	(0.02)	(0.00)	(0.01)	(0.15)	(0.37)
CxL1							
_cons	0.003	-0.018	0.055***	0.006***	0.032***	-0.013***	-0.000***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
L1x							
Age	0.094	0.010	-0.166	0.012	-0.131	0.009	-0.080
	(0.18)	(0.08)	(0.12)	(0.05)	(0.08)	(0.04)	(0.08)
Age squared	-0.006	-0.001	0.017	-0.000	0.015	0.000	0.010
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Number of children	-0.005	0.038	-0.293	0.017	-0.025	0.007	0.148**
	(0.07)	(0.05)	(0.23)	(0.04)	(0.03)	(0.04)	(0.05)
Presence of elderely	0.040	0.005	0.017	0.008	0.029**	-0.014	-0.036**
	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
_cons	1.744**	3.659***	0.848	2.833***	1.727***	3.676***	5.075***
	(0.61)	(0.42)	(0.59)	(0.25)	(0.34)	(0.27)	(0.49)
L1xL1							
_cons	-0.008***	-0.013***	-0.004*	-0.011***	-0.006***	-0.013***	-0.018***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
IND							
fixed_cost	-8.536***	-11.306***	-13.713***	-13.107***	-12.772***	-12.667***	-17.982***
	(1.08)	(0.96)	(1.42)	(0.71)	(1.13)	(0.97)	(1.93)
sd_1							
_cons	0.016**	0.001	-0.015	0.000	-0.000	-0.003	0.000
	(0.01)	(0.02)	(0.02)	(0.00)	(0.02)	(0.10)	(369.10)
N	255	303	217	770	374	342	230
pseudo R^2	0.355	0.395	0.514	0.407	0.391	0.526	0.684

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.9: Labour supply estimates: Couple

	(AT)	(BE)	(CY)	(DE)	(EE)	(EL)
Temp. choice						
Cx						
Age women	0.008	0.018***	-0.006	0.016**	0.51	0.020*
	(0.00)	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)
Age men	-0.000	-0.010*	-0.052***	-0.031***	-0.008	-0.019
	(0.00)	(0.00)	(0.01)	(0.01)	(0.03)	(0.01)
Number of children	0.027	0.032	0.100**	0.115***	0.051	0.053
	(0.01)	(0.02)	(0.03)	(0.02)	(0.08)	(0.03)
_cons	-0.023	-0.123	-0.331*	-0.103	1.150*	-0.121
	(0.03)	(0.07)	(0.17)	(0.09)	(0.48)	(0.16)
CxC						
_cons	-0.000	-0.000	0.002**	0.000	-0.010*	0.002*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CxL1						
_cons	-0.000	-0.000	0.001*	0.000	-0.002	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CxL2						
_cons	-0.000	0.000*	0.002***	0.001	-0.002	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L1x						
Age women	-0.125***	-0.080**	-0.069***	-0.077***	-0.034*	-0.106***
	(0.02)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)
Age women squared	0.018***	0.011**	0.008***	0.010***	0.006**	0.014***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Number of children	0.084***	0.015	0.017	0.058***	0.022	0.015
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
# of children <2 y/o	0.029***	0.010	0.005	0.013*	0.028***	0.001
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
# of children <6 y/o	0.018***	0.018***	0.008	0.022***	0.005	0.004
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
# of children <12 y/o	0.014**	0.014***	0.009	0.011**	0.002	0.004
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
# of children <17 y/o	-0.006	0.007	0.007	0.013**	-0.001	0.004
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
Presence of elderly	-0.028	0.034	-0.052	0.031	0.011	0.010
	(0.02)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)
_cons	3.289***	3.150***	4.305***	3.378***	3.405***	2.905***
	(0.18)	(0.21)	(0.32)	(0.14)	(0.14)	(0.10)
L1xL1						
_cons	-0.011***	-0.012***	-0.016***	-0.012***	-0.012***	-0.010***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L2x						
Age men	-0.157***	-0.061**	-0.048	-0.113***	-0.071**	-0.101***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.01)
Age squared men	0.020***	0.008**	0.004	0.012***	0.010***	0.013***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Number of children	0.021	0.012	0.028	0.071***	-0.008	0.009
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
_cons	3.226***	2.843***	3.193***	3.535***	4.077***	2.468***
	(0.11)	(0.13)	(0.18)	(0.12)	(0.18)	(0.09)
L2xL2						
_cons	-0.011***	-0.011***	-0.012***	-0.013***	-0.014***	-0.009***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L1xL2						
_cons	-0.000	0.001***	0.001*	0.000	-0.001*	-0.000**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
IND						
fixed_cost1	-7.779***	-9.612***	-14.5457***	-9.743***	-10.142***	-10.143***
	(0.50)	(0.58)	(0.97)	(0.41)	(0.42)	(0.30)
fixed_cost2	-11.295***	-12.213***	-12.905***	-13.113***	-13.805***	-9.851***
	(0.45)	(0.53)	(0.62)	(0.35)	(0.49)	(0.28)
sd_1						
_cons	0.004***	0.004*	0.009*	0.010***	0.047**	0.022***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
N	1550	1187	882	2846	1598	3763
pseudo R^2	0.377	0.344	0.378	0.337	0.440	0.251

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.10: Labour supply estimates: Couple

	(ES)	(FI)	(FR)	(IE)	(IT)	(LT)
Temp. choice						
Cx						
Age women	0.034***	0.009	0.006	0.012	0.036***	0.007
	(0.01)	(0.01)	(0.06)	(0.01)	(0.01)	(0.04)
Age men	-0.030***	0.015*	0.040	-0.025**	-0.013***	0.001
	(0.01)	(0.01)	(0.03)	(0.01)	(0.00)	(0.05)
temp_children	0.038*	0.011	-0.155*	0.050*	0.043**	0.072
	(0.02)	(0.02)	(0.08)	(0.02)	(0.01)	(0.18)
_cons	0.009	0.315***	0.230	1.127***	-0.151**	0.477
	(0.09)	(0.09)	(0.15)	(0.14)	(0.06)	(0.45)
CxC						
_cons	-0.000	-0.001*	-0.001	-0.002***	-0.000	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CxL1						
_cons	-0.000	-0.000	-0.001***	-0.002***	-0.001***	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CxL2						
_cons	0.000	-0.001***	-0.002***	-0.004***	0.000	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L1x						
Age women	-0.099***	-0.056***	-0.095***	-0.055**	0.138***	-0.067***
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Age squared women	0.013***	0.007***	0.013***	0.007***	-0.017***	0.008***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Number of children	0.022*	0.009	0.009	0.028*	0.035**	-0.004
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
# of children <2 y/o	0.004	0.000	0.027***	-0.002	0.011***	-0.008
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
# of children <6 y/o	0.006	0.000	0.018***	0.010**	-0.001	0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
# of children <12 y/o	0.010**	0.002	0.019***	0.011***	0.002	0.017
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
# of children <17 y/o	0.011*	-0.013*	0.011**	0.007	0.000	0.013
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Presence of elderly	0.009	-0.004	0.006	-0.013	-0.002	-0.009
	(0.01)	(0.03)	(0.02)	(0.02)	(0.01)	(0.01)
_cons	3.377***	3.031***	3.589***	3.898***	3.456***	3.626***
	(0.13)	(0.08)	(0.11)	(0.25)	(0.17)	(0.20)
L1xL1						
_cons	-0.012***	-0.011***	-0.013***	-0.013***	-0.014***	-0.013***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L2x						
Age men	-0.065***	-0.042***	-0.117***	-0.016	-0.174***	-0.043
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)
Age squared men	0.008***	0.009***	0.016***	0.002	0.022***	0.007*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Number of children	0.008	-0.004	0.014**	0.031*	-0.002	0.000
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.03)
_cons	2.922***	2.977***	3.373***	3.239***	3.797***	3.719***
	(0.09)	(0.09)	(0.08)	(0.15)	(0.09)	(0.20)
L2xL2						
_cons	-0.011***	-0.011***	-0.012***	-0.011***	-0.013***	-0.014***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L1xL2						
_cons	0.000	-0.000	0.000*	-0.001**	0.000**	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
IND						
fixed_cost1	-10.489***	-9.371***	-11.3129***	-10.670***	-10.806***	-13.024***
	(0.35)	(0.26)	(0.34)	(0.72)	(0.46)	(0.68)
fixed_cost2	-11.133***	-9.645***	-12.103***	-9.778***	-12.555***	-14.736***
	(0.31)	(0.25)	(0.33)	(0.40)	(0.30)	(0.73)
sd_1						
_cons	0.007***	0.008**	0.063***	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.01)
N	2805	3711	2936	1410	3521	750
pseudo R^2	0.312	0.358	0.428	0.288	0.372	0.413

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.11: Labour supply estimates: Couple

	(LU)	(LV)	(MT)	(NL)	(PT)	(SI)	(SK)
Temp. choice							
Cx							
Age women	0.000	0.102*	-0.101	0.013***	-0.006	0.000	-140.327
	(0.01)	(0.05)	(0.55)	(0.00)	(0.01)	(0.00)	(19813.34)
Age men	-0.029***	-0.042	-0.335	-0.009*	-0.020	0.017***	133.297
	(0.01)	(0.05)	(0.55)	(0.00)	(0.01)	(0.00)	(18050.28)
Number of children	0.017	0.128	-0.518	0.088***	0.057	0.001	-59.992
	(0.02)	(0.12)	(0.57)	(0.01)	(0.03)	(0.00)	(7453.41)
_cons	0.237*	0.582	-1.808	0.346***	0.444***	-0.083***	9.940
	(0.10)	(0.48)	(1.36)	(0.07)	(0.10)	(0.02)	(10088.85)
CxC							
_cons	-0.000	-0.005	0.011	-0.000***	-0.001	-0.000	-1.648
	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(261.85)
CxL1							
_cons	-0.000	-0.001	-0.001***	-0.001***	-0.000	-0.000	-0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CxL2							
_cons	0.000	-0.002	-0.002***	-0.001**	-0.000	-0.000***	-0.007***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L1x							
Age	-0.126***	-0.034**	-0.037	-0.029	-0.085***	-0.119***	-0.139***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.01)	(0.01)	(0.02)
Age squared	0.017***	0.005***	0.008*	0.009***	0.012***	0.015***	0.017***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Number of children	0.022	0.001	0.020	0.106***	-0.003	0.007	0.038***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
# of children <2 y/o	0.032***	0.020**	0.009	0.023***	0.015**	0.014**	0.063***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
# of children <6 y/o	0.021***	0.014*	0.011	0.030***	0.014***	-0.004	0.006
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
# of children <12 y/o	0.009	0.003	0.005	0.024***	0.019***	0.004	0.004
	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
# of children <17 y/o	0.002	0.012	0.007	0.021***	0.021***	0.009	-0.002
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Presence of elderly	-0.028	-0.004	-0.011	0.088	0.009	-0.000	0.004
	(0.03)	(0.01)	(0.02)	(0.06)	(0.01)	(0.01)	(0.01)
_cons	3.318***	3.402***	4.297***	3.404***	3.847***	4.175***	4.690***
	(0.21)	(0.17)	(0.31)	(0.17)	(0.12)	(0.17)	(0.22)
L1xL1							
_cons	-0.011***	-0.012***	-0.015***	-0.011***	-0.014***	-0.015***	-0.016***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L2x							
Age men	-0.141***	0.001	-0.069*	-0.038*	-0.106***	-0.080*	-0.120***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.02)
Age squared men	0.018***	0.002	0.009*	0.009***	0.015***	0.011**	0.016***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Number of children	0.010	-0.009	-0.023*	0.090***	0.015	-0.008	0.006
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
_cons	3.385***	3.848***	3.913***	3.881***	3.431***	3.740***	4.612***
	(0.19)	(0.22)	(0.19)	(0.12)	(0.10)	(0.14)	(0.19)
L2xL2							
_cons	-0.011***	-0.014***	-0.014***	-0.013***	-0.012***	-0.014***	-0.016***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L1xL2							
_cons	-0.001	0.000	-0.001***	-0.002***	0.000	0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
IND							
fixed_cost1	-9.136***	-12.043***	-16.080***	-7.595***	-14.370***	-14.547***	-16.797***
	(0.55)	(0.52)	(0.96)	(0.47)	(0.42)	(0.55)	(0.77)
fixed_cost2	-11.994***	-13.781***	-16.094***	-12.643***	-14.574***	-13.196***	-18.368***
	(0.59)	(0.57)	(0.82)	(0.33)	(0.48)	(0.51)	(0.93)
sd_1							
_cons	0.011***	0.061*	-0.053	-0.002***	-0.010**	0.000	0.000
	(0.00)	(0.02)	(0.37)	(0.00)	(0.00)	(0.00)	(597.90)
N	1056	1137	807	2948	2314	1508	1002
pseudo R^2	0.368	0.409	0.591	0.388	0.425	0.471	0.557

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.12: Net wage elasticities

	AT	BE	CY	DE	EE	EL	ES	FI	FR	IE	IT	LT	LU	LV	MT	NL	PT	SI	SK
Single women																			
Own wage	-0.05	0.46	-0.13	0.05	0.05	-0.62	-0.07	0.10	-0.02	0.23	-0.09	0.05	0.26	0.06	-0.55	0.02	0.14	0.10	0.07
Single men																			
Own-wage	0.10	0.48	0.05	0.06	0.12	-0.16	0.36	0.03	0.08	0.00	-0.06	0.24	-0.02	0.04	-0.04	-0.11	-0.01	0.04	0.12
Couple: women																			
Own wage	-0.03	-0.42	0.04	-0.12	0.07	-0.06	-0.10	0.13	0.06	0.11	-1.91	0.07	0.15	0.04	0.02	0.35	0.11	-0.09	0.03
Cross wage	0.00	-0.10	-0.03	-0.06	-0.04	0.03	0.01	-0.02	0.05	-0.07	0.01	-0.06	-0.04	-0.04	0.00	0.04	-0.08	-0.04	0.03
Couple: men																			
Own wage	-0.05	-0.31	-0.12	-0.20	0.05	-0.06	-0.10	0.29	0.01	0.14	-0.11	0.03	0.01	0.09	0.01	0.12	0.04	-0.21	0.03
Cross wage	-0.02	-0.16	0.00	-0.01	-0.02	0.01	-0.02	0.02	0.01	0.04	0.02	0.00	-0.10	0.00	0.01	-0.06	-0.07	0.00	0.00

Table A.13: Income elasticities

AT	BE	CY	DE	EE	EL	ES	FI	FR	IE	IT	LT	LU	LV	MT	NL	PT	SI	SK
Single: women																		
-0.188	-0.110	-0.094	-0.161	-0.067	-0.225	-0.103	-0.315	-0.242	-0.290	-0.013	-0.074	-0.087	0.005	-0.750	-0.173	-0.156	0.090	0.009
Single: men																			
-0.142	-0.188	0.018	-0.080	-0.019	-0.236	-0.053	-0.622	-0.003	-0.461	-0.010	-0.319	-0.242	0.000	-0.089	-0.329	-0.412	0.000	0.000
Couple: women																			
0.000	-0.028	0.000	-0.007	-0.022	0.009	0.000	-0.080	0.020	-0.020	0.016	0.000	-0.072	-0.011	0.000	0.021	-0.028	0.000	0.000
Couple: men																			
-0.007	-0.050	-0.027	-0.010	-0.011	0.006	0.000	-0.072	0.013	0.000	0.001	-0.016	-0.118	0.000	0.014	-0.028	-0.031	0.007	0.003

Table A.14: Change in full-time equivalent: Single

	Single women						Single men				
	Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4		Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4
AT	393.25	0.00	0.00	-0.76	0.25	AT	427.50	0.00	-0.12	-0.47	0.12
BE	232.75	-1.55	-1.77	-1.53	0.00	BE	241.25	-6.42	-6.42	-5.52	0.00
CY	369.00	-0.80	-0.80	-0.80	0.00	CY	134.25	0.37	0.37	0.37	0.75
DE	1151.25	0.00	-0.40	-0.74	0.00	DE	808.50	0.00	-0.62	-0.62	0.00
EE	436.50	0.00	0.00	0.00	0.00	EE	257.50	0.00	0.00	0.00	0.00
EL	523.25	-0.06	-2.52	-2.52	-0.06	EL	571.50	-0.74	-1.69	-2.34	-0.46
ES	428.00	0.00	-0.23	-0.52	0.76	ES	365.50	-1.03	-1.85	-3.21	1.36
FR	867.50	0.00	0.00	0.29	-0.11	FR	755.00	0.00	0.00	-0.13	0.39
FI	530.75	0.00	0.00	0.00	-0.14	FI	500.25	0.00	0.00	0.00	2.28
IE	196.75	0.00	0.00	0.00	2.28	IE	112.00	0.00	0.00	-0.79	0.40
IT	1053.50	-0.29	-0.29	-1.17	-0.29	IT	871.50	-0.54	-0.66	-1.17	-0.54
LT	190.50	-0.26	-0.79	-1.57	-0.26	LT	84.00	0.00	-3.57	-3.57	1.19
LU	208.75	0.00	0.00	0.00	0.00	LU	245.75	0.00	0.00	0.00	0.00
LV	508.50	0.00	0.00	-0.10	0.00	LV	253.50	0.19	0.19	0.39	0.00
MT	127.50	-1.57	-1.57	-1.57	-1.56	MT	200.50	-0.50	-1.00	-1.50	0.00
NL	683.00	0.00	-0.29	-1.32	0.21	NL	601.50	0.00	-1.00	-1.00	2.36
PT	570.00	-1.01	-1.01	-0.50	-1.10	PT	294.75	-2.12	-2.12	-1.53	-1.69
SI	263.50	0.00	-0.38	-0.38	-0.38	SI	298.00	0.00	0.00	-0.67	-0.67
SK	284.75	0.00	-0.35	-0.35	0.00	SK	194.75	0.00	0.00	0.51	0.00

X

Table A.15: Change in full-time equivalent: Couple

	Couple: Women					Couple: Men				
	FTE Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4	FTE Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4
AT	1053.5	0	0	0	0	1410.25	0	0	0	0
BE	775.25	0.3	0.3	0	2.11	970	0.2	0.26	0	0
CY	721.25	0.08	0.08	0.08	0	720.25	-0.14	-0.14	-0.27	-0.27
DE	1901.5	0	-0.05	-0.08	0	2469	0	0.04	0.08	0
EE	1298	0	-0.35	-0.47	0.04	1513.5	0	0	0.1	0.06
EL	1909.75	0.09	-0.8	-0.8	0.09	3019.5	0.03	-0.2	-0.2	0.03
ES	1859	0	0	-0.56	-0.21	2433.25	0	0	-0.26	-0.06
FI	3043.25	0	0	0	0.1	3329.25	0	0	0	-0.02
FR	2305.5	-0.09	-0.09	-0.11	-0.17	2613.25	-0.07	-0.07	-0.04	-0.04
IE	767.75	-0.2	-0.2	-0.13	0.13	1165.5	-0.21	-0.21	-0.13	0.12
IT	2082	1.59	1.18	0.96	1.6	3048	0.16	0.21	0.25	0.16
LT	579.75	-0.09	-0.09	-0.47	0.17	613.25	-0.16	-0.16	-0.41	0
LU	710.5	0.07	0.07	-0.11	0.21	922.75	0	0	0	0.05
LV	906.5	-0.28	-0.28	-0.72	-0.11	1045.25	-0.53	-0.43	-1.03	0
MT	496.5	-0.1	-0.1	0	-0.1	717.5	0.07	0.07	0	0.07
NL	1758.75	0	-0.28	-0.48	0.27	2652.75	0	-0.09	-0.22	0.33
PT	1767.75	-0.64	-0.65	-0.2	-0.64	1947.25	-1.39	-1.39	-0.35	-1.39
SI	1189.5	0	0	0	0,08	1340.75	0	0	0	0
SK	701.5	0	0	0.14	0	874.5	0	0	0	0

Table A.16: Variation in labour market participation by country

	Non-participation rate					Full-time working rate				
	Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4
AT	9.72	0	0	0	0	68.52	0	0	0	0
BE	22.04	0.78	0.78	0.66	-0.04	52.54	-0.5	-0.53	-0.54	0.06
CY	22.52	0.13	0.17	0.08	0	63.99	-0.13	-0.17	-0.04	-0.11
DE	16.82	-0.02	0.24	0.33	0	62.25	0.01	-0.23	-0.33	0
EE	7.48	0.07	0.02	0.11	-0.04	78.04	-0.05	-0.05	-0.13	0.02
EL	33.42	0.03	0.5	0.53	0.04	47.75	-0.01	-0.38	-0.43	-0.02
ES	21.19	0.09	0.11	0.22	0.02	59.93	-0.09	-0.1	-0.15	-0.11
FI	10.16	0	0	0	0	68.9	0	0	0	0
FR	11.55	0.02	0.02	-0.07	0	68.83	-0.03	-0.03	-0.01	0.02
IE	24.91	-0.41	0.1	0	-0.26	42.75	-0.08	-0.08	-0.08	-0.08
IT	21.84	-0.08	-0.01	0.1	-0.08	38.71	0.13	0.08	0.02	0.13
LT	14.91	0.17	1.48	1.12	-0.34	68.42	-0.07	0.48	-0.77	0.14
LU	14.15	-0.02	-0.02	0	0.71	62.28	0	0	0	0
LV	10.67	0.07	0.05	0.24	0.01	74.27	-0.14	-0.12	-0.26	-0.02
MT	28.75	0.33	0.44	0.55	0.22	59.06	-0.33	-0.44	-0.55	-0.22
NL	18.41	0.22	0	0.69	-0.61	54.02	0	-0.12	-0.37	0.45
PT	18.3	0.97	0.97	0.43	0.92	67.37	-0.86	-0.86	-0.3	-0.86
SI	12.38	0	0.08	0.08	1.55	73.03	0.03	-0.04	0.1	0.1
SK	18.93	0	0.04	-0.07	0	72.13	0	-0.04	0	0

Table A.17: Variation in mean hours in percentage by country

	Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4
AT	33.45	0.00	0.00	0.00	0.00
BE	27.07	-1.00	-1.00	-1.37	0.37
CY	29.17	-0.21	-0.24	-0.10	-0.07
DE	30.95	0.00	-0.29	-0.42	0.00
EE	35.98	-0.06	-2.45	-2.58	-2.36
EL	25.5	-0.39	-0.78	-0.90	-0.08
ES	26.88	0.04	0.07	0.07	-0.37
FI	33.96	0.00	0.00	0.00	0.09
FR	33.71	-0.03	-0.03	0.03	0.03
IE	26.59	-0.60	-0.15	-0.79	-0.60
IT	28.57	0.07	-0.04	-0.21	0.04
LT	32.72	-0.46	-2.84	-2.75	-1.41
LU	32.41	0.00	0.00	-0.03	0.00
LV	34.52	-0.14	-0.12	-0.32	-0.03
MT	27.74	-0.47	-0.61	-0.79	-0.32
NL	28.01	0.00	-0.21	-0.82	0.89
PT	32.43	-1.20	-1.20	-0.56	-1.14
SI	33.93	0.00	-0.09	-0.09	-0.09
SK	32.13	0.00	-0.06	0.09	0.00

Table A.18: Impact of the reform on Gini coefficient: Single

	Single women					Single men				
	Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4
AT	0.194	2.30	2.21	2.05	2.72	0.208	-16.03	-16.03	-16.03	-15.96
BE	0.259	-15.19	-14.70	-14.37	-5.88	0.245	-32.50	-31.67	-31.21	-24.13
CY	0.329	-7.22	1.35	1.35	3.78	0.311	5.47	5.47	5.47	5.28
DE	0.227	-2.48	-2.77	-2.77	-2.48	0.269	0.56	0.00	-0.36	0.56
EE	0.174	0.18	-2.12	-2.07	-2.13	0.193	-14.92	-14.93	-15.03	-14.92
EL	0.307	-3.03	-9.33	-9.51	-3.02	0.253	-3.18	-0.15	-0.15	-1.62
ES	0.468	-18.30	-18.38	-18.88	-18.25	0.338	-26.19	-26.38	-26.69	-25.62
FI	0.169	5.19	5.19	5.19	5.59	0.209	-23.60	-23.60	-23.60	-23.31
FR	0.279	0.01	-0.26	-0.04	0.31	0.285	0.35	0.76	0.19	0.73
IE	0.278	-5.09	-5.09	-5.09	-3.46	0.237	-18.12	-18.12	-18.12	-17.04
IT	0.362	-7.85	-7.94	-7.85	-7.85	0.365	-4.89	-5.04	-5.56	-4.89
LT	0.344	0.81	0.49	-0.57	2.00	0.373	2.10	0.00	1.85	2.54
LU	0.249	2.92	2.92	2.93	2.92	0.209	-7.02	-6.99	-6.97	-7.02
LV	0.244	0.60	0.40	-0.23	0.76	0.303	0.57	0.57	-0.13	0.90
MT	0.320	0.51	0.74	0.83	0.51	0.208	-6.05	-5.37	-4.94	-4.45
NL	0.269	-1.00	-1.33	-1.69	-0.20	0.190	4.29	3.96	3.45	6.45
PT	0.274	-9.81	-9.81	-9.81	-9.79	0.298	-7.73	-7.83	-6.47	-6.94
SI	0.274	0.73	-100.00	-9.07	0.58	0.301	-0.69	-0.79	-0.85	-0.67
SK	0.217	0.00	0.00	0.00	0.00	0.313	-1.00	-1.17	-1.64	-1.00

Table A.19: Impact of the reform on Gini coefficient: Couple

	Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4
AT	0.28555	-13.59	-13.64	-13.72	0.06
BE	0.2275	-9.35	-7.46	-7.50	-7.16
CY	0.24093	-0.42	0.00	-0.49	0.19
DE	0.23751	-1.67	-1.82	-1.92	-0.75
EE	0.17091	-5.89	-5.94	-5.98	0.00
EL	0.29748	-1.03	-3.82	-3.82	-0.13
ES	0.2636	-4.74	-7.29	-7.38	0.24
FI	0.18206	-0.93	-0.93	-0.93	0.13
FR	0.27568	0.08	0.05	0.01	0.12
IE	0.21588	5.09	5.06	5.03	-2.26
IT	0.30607	-7.50	-7.33	-7.50	-0.77
LT	0.28507	-2.50	-2.60	-2.84	0.09
LU	0.1821	-6.45	-6.47	-6.47	0.39
LV	0.24885	0.38	0.29	-0.58	-0.08
MT	0.29684	0.02	-0.06	-0.09	0.02
NL	0.23554	-5.86	-6.02	-6.22	1.15
PT	0.23458	-0.14	-0.14	0.07	-2.04
SI	0.45418	-2.64	-2.65	-2.65	-0.04
SK	0.24118	-0.02	-0.07	-0.18	-0.01

Note:Change are expressed in variation rate in percentage.

Table A.20: Reforms impact on poverty in percentage points: Single

	Single women					Single men				
	Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4
AT	8.42	0	-0.4	-0.4	0	3.38	0	0	0	0
BE	19.28	-5.42	-6.25	-5.33	0	19.28	-7.53	-9.09	-9.09	3.05
CY	24.66	-0.27	-0.27	-0.27	0.41	20.93	0	0	0	-0.34
DE	14.62	0	-0.53	-0.54	0.06	14.76	0	-0.2	-0.2	0
EE	3.31	0	-0.01	-0.01	0	5.99	0	0	0	0
EL	28.82	-0.59	3.35	3.35	-0.59	23.11	-3.62	-3.11	-2.79	-3.62
ES	41.98	0	0	0	0.18	28.01	0	-0.22	-0.66	0.4
FI	3.97	0	0	0	-0.14	10.08	0	0	0	-0.16
FR	20.62	0	0	-0.09	0.47	19.67	0	-0.47	-0.7	-0.23
IE	26.68	0	0	0	0.19	20	0	0	0	0
IT	25.98	-0.4	-0.17	-0.73	-0.4	27.86	-0.4	-0.4	-0.65	-0.4
LT	13.97	0	0	-0.43	0	22.43	0	-0.94	-0.94	0.93
LU	8.13	0	0	0	0	9.84	-0.4	-0.4	-0.4	0
LV	9.36	-0.18	-0.18	-0.7	-0.18	13.86	-0.33	-0.33	-0.33	0
MT	33.1	0	0	0	0	6.45	-0.46	-0.46	-0.46	-0.46
NL	20.27	0	0	-0.6	1.28	8.31	0	-0.39	-0.52	2.49
PT	19.68	-1.03	-1.03	-0.59	-0.74	17.11	-0.53	-0.53	-0.27	-0.53
SI	18.97	0	0	-0.32	-0.32	15.79	0	0	0	0
SK	16.09	0	0	0	0.01	26.09	-0.44	-0.44	-0.44	-0.44

Table A.21: Reforms impact on poverty in percentage points: Couple

	Baseline	Sc. 1	Sc. 2	Sc. 3	Sc. 4
AT	10.39	0	0	-0.13	0
BE	14.77	-3.31	-2.05	-2.03	-14.77
CY	14.97	0	0	0	0.24
DE	11.28	0	-1.1	-0.28	0
EE	3.75	-0.06	-0.06	-0.06	-0.06
EL	27.34	-0.98	0.1	0.08	0
ES	14.83	-0.04	-0.04	-0.07	0.14
FI	4.74	0	0	0	0.22
FR	15.71	-0.07	-0.1	-0.26	0.06
IE	12.55	0	0	0	-1.45
IT	26.04	-0.48	-0.41	-0.42	-0.48
LT	12.67	0	-0.14	-0.14	-0.1
LU	5.59	0.09	0	0	0.19
LV	8.89	-0.27	-0.27	-0.62	-0.09
MT	22.92	0.13	0	-0.12	0.13
NL	9.43	0	-0.07	-0.2	0.56
PT	10.85	-1.26	-1.26	-0.18	-1.13
SI	9.08	0	0	-0.87	-9.08
SK	15.47	0	0	0	-15.47

General Conclusion

This dissertation aims at improving the understanding of poverty faced by workers and the role of unemployment benefits in protecting these workers. It highlights the drivers of income poverty for workers and the study of how unemployment benefits should be designed to achieve better income protection by considering the effect on workers' behaviours. It contributes to adjacent fields of economic literature, in particular labour and public economics. This section presents an overview of the contributions and policy implications and this thesis's limitations and future extensions.

Contributions of the thesis

Chapter 1 deals with temporary contract employment incidence on poverty with a focus on the case of Germany. Results suggest that temporary workers face a higher risk of poverty than permanent workers. I find that the risk of entering and remaining in poverty is particularly high for temporary agency and fixed-term with a concise duration. The results show that depending on the household composition, being on a temporary contract has a different impact on the risk of poverty. Single individuals, particularly women, face a considerably higher risk of poverty when they are on a temporary agency contract. The state-dependence of poverty is particularly high for single women compared to other subgroups. Overall, being on a temporary contract increases the chances of being poor for single individuals, and once poor, this group is more likely to remain so. Temporary employment does not seem to affect the poverty risk of in-couple individuals.

Now that the drivers of income poverty with a focus on temporary workers have been highlighted, the last two chapters focused on unemployment benefits as a tool to improve the income protection of workers.

Chapter 2 studies the effect of a common unemployment insurance benefit for

the Eurozone countries on income protection of atypical workers in case of job loss. This work suggests that atypical workers face lower coverage rates of unemployment benefits. A common unemployment benefit system would increase the potential coverage in many countries and fill the current gap between countries. The simulated unemployment benefit would also protect many workers from falling into poverty when becoming unemployed. Allowing access to the main unemployment benefit for the self-employed would significantly protect these workers from poverty. As this common unemployment benefit system increases income protection, it could be expected to perform well as a stabilisation tool.

Chapter 3 investigates different designs of a European unemployment insurance scheme on individuals' labour supply and poverty and inequalities. It shows that a common flat-rate benefit would imply relatively strong disincentives to work, even though the poverty reduction associated is consequent. Unemployment benefits with a common replacement rate among EU countries, articulated with floor and ceiling amounts, would allow for upward convergence as it would strongly reduce poverty and inequalities in several countries, especially where poverty rates tend to be high. In addition, it would relatively moderate labour supply reduction, thus limiting potential labour market distortions.

Policy recommandations

These different chapters allow me to draw some policy recommendations. The first would be to design anti-poverty policies. It is essential to consider that being poor at one point in time implies future poverty. Thus, anti-poverty policies have a broader impact than reducing contemporaneous poverty. It also seems crucial to consider policies tackling factors enhancing this poverty trap. Attention should be devote to financial support to rapidly lift individuals out of poverty, such as increases in the minimum wage, in-work benefits or child benefits, would be beneficial. I also provide findings on the effects of several unemployment insurance designs on poverty, inequalities and incentive to work for individuals. I provide evidence of the sensibility of individuals' labour supply to different changes in the parameters of unemployment benefits and the effects of these reforms on poverty and inequalities. Attention should be paid to the articulation between the presence of floors and ceilings and whether payments are lump-sum or not, which have very different implications in terms of

redistribution and individual behaviours.

Limitations and future extensions

It is essential to stress that this work has limitations which might be an open door for future research.

Chapter 1. This analysis is based on the indicator of poverty, defined as the household-level equivalised disposable income being lower than 60% of the median disposable income. Although this is one of the most widely used indicators, this choice is somewhat arbitrary. It would be interesting to study the effects by considering other poverty thresholds. For example, to look more precisely at how this impacts the risk of extreme poverty. Other indicators, such as the risk of poverty and material deprivation, allow the multiple dimensions of poverty to be taken into account. The severe material deprivation indicator SMD is based on a score calculated on a given set of items capturing the ability or inability to afford goods considered essential to reach an adequate standard of living. Thus, the threshold does not depend on a national median.

Chapter 2. The results should be tempered first by the fact that this analysis is made for current workers, who may not represent the currently unemployed. Also, we assume full compliance with national policies and the EMU-UI and do not consider tax evasion or benefit non-take-up. Thus, non-take-up of benefits was not considered, possibly leading to the potential effects of unemployment benefits reforms being overestimated. Our analysis is static in the sense that behavioural responses are not considered, for example, individuals' supply of labour, which may be affected by the reform.

Chapter 3. I do not take into account the scheme's budget and, more precisely, the scheme's financing. It would be necessary to simulate a budget-neutral policy financed by social contributions to employees, for example, to assess the effects on redistribution and poverty fully. Also, this work only provides insight into potential labour market distortion on the supply side. I ignore labour demand in this case. However, the labour supply is usually constrained by labour demand, especially in the European labour market, as shown by Peichl and Siegloch [2012]. A way to go further in the analysis could be to simulate unemployment insurance reforms in the labour supply-demand model, such as in Peichl and Siegloch [2012]. Another way would be to implement this analysis in the recent framework of labour supply-

demand EUROLAB [Narazani et al., 2021], representing a partial labour market equilibrium in line with Colombino's approach (2013) and based on the use of the microsimulation model EUROMOD. This would allow us to consider involuntary unemployment in the analysis, which is not the case in this chapter.

Bibliography

R. Aaberge, U. Colombino, and S. Strøm. Labour supply in italy: an empirical analysis of joint household decisions, with taxes and quantity constraints. *Journal of Applied Econometrics*, 14(4):403–422, 1999.

A. Albanese and G. Gallo. Buy flexible, pay more: the role of temporary contracts on wage inequality. *Labour Economics*, 64:101814, 2020.

C. Alcidi, M. Barslund, M. Busse, and F. Nicoli. Will a european unemployment benefits scheme affect labour mobility? 2016.

C. Amuedo-Dorantes and R. Serrano-Padial. Labor market flexibility and poverty dynamics. *Labour Economics*, 17(4):632–642, 2010.

I. M. A. T. B. B. B. K. B. S. R. G. S. R. Anderton, R. Euro area labour markets and the crisis. 2012.

L. Andor. Basic European Unemployment Insurance - The Best Way forward in Strengthening the EMU's Resilience and Europe's Recovery. *Intereconomics*, 49 (4):184–189, 2014.

L. Andor. Towards shared unemployment insurance in the euro area. *IZA Journal of European Labor Studies*, 5(1):1–15, 2016.

H.-J. Andress and H. Lohmann. *The working poor in Europe: Employment, poverty and globalisation*. Edward Elgar Publishing, 2008.

S. Ayllón. Understanding poverty persistence in spain. *SERIEs*, 4(2):201–233, 2013.

M. N. Baily. Some aspects of optimal unemployment insurance. *Journal of public Economics*, 10(3):379–402, 1978.

E. Bardasi and J. C. Gornick. Working for less? women's part-time wage penalties across countries. *Feminist economics*, 14(1):37–72, 2008.

O. Bargain, M. Caliendo, P. Haan, and K. Orsini. "Making work pay" in a rationed labor market. *Journal of Population Economics*, 23(1):323–351, January 2010.

O. Bargain, K. Orsini, and A. Peichl. Comparing Labor Supply Elasticities in Europe and the United States: New Results. *Journal of Human Resources*, 49(3):723–838, 2014.

M. Beblavý and K. Lenaerts. Feasibility and Added Value of a European Unemployment Benefits Scheme. pages 1–103, 2017.

M. Beblavỳ and I. Maselli. An unemployment insurance scheme for the euro area: A simulation exercise of two options. *CEPS Special Reports No*, 98, 2014.

M. Beblavỳ, G. Marconi, I. Maselli, et al. A european unemployment benefits scheme: The rationale and the challenges ahead. *CEPS Special Report*, 19, 2015.

M. Biewen. Measuring state dependence in individual poverty histories when there is feedback to employment status and household composition. *Journal of Applied Econometrics*, 24(7):1095–1116, 2009.

O. Blanchard and A. Landier. The perverse effects of partial labour market reform: fixed-term contracts in france. *The Economic Journal*, 112(480):F214–F244, 2002.

R. Blundell, A. Duncan, J. McCrae, and C. Meghir. The labour market impact of the working families' tax credit. *Fiscal Studies*, 21(1):75–103, March 2000.

P. Bollé. Part-time work: Solution or trap?. *International Labour Review*, 136(4): 557–79, 1997.

H. Bonin, K. Reuss, and H. Stichnoth. The monetary value of family policy measures in germany over the life cycle: Evidence from a dynamic microsimulation model. *CESifo Economic Studies*, page ifw014, 2016.

A. L. Booth, M. Francesconi, and J. Frank. Temporary jobs: stepping stones or dead ends? *The economic journal*, 112(480):F189–F213, 2002.

B. G. J. Borjas. Self-Selection and the Earnings of Immigrants. *The American Economic Review*, 80(1):305–308, 1990.

G. Bosio. The implications of temporary jobs on the distribution of wages in i taly: An unconditional ivqte approach. *Labour*, 28(1):64–86, 2014.

P. Bourdieu. *Job Insecurity is Everywhere Now '. Acts of resistance*. New Press New York, 1998.

F. Bourguignon and A. Spadaro. Microsimulation as a tool for evaluating redistribution policies. *The Journal of Economic Inequality*, 4(1):77–106, 2006.

J. Boysen-Hogrefe and D. Groll. The german labour market miracle. *National Institute Economic Review*, 214:R38–R50, 2010.

E. Brancaccio, F. De Cristofaro, and R. Giammetti. A meta-analysis on labour market deregulations and employment performance: no consensus around the imf-oecd consensus. *Review of Political Economy*, 32(1):1–21, 2020.

S. Buchler, M. Haynes, and J. Baxter. Casual employment in australia: the influence of employment contract on financial well-being. *Journal of sociology*, 45(3):271–289, 2009.

B. Burgoon and F. Dekker. Flexible employment, economic insecurity and social policy preferences in europe. *Journal of European Social Policy*, 20(2):126–141, 2010.

P. Cahuc and F. Postel-Vinay. Temporary jobs, employment protection and labor market performance. *Labour economics*, 9(1):63–91, 2002.

L. Cappellari and S. P. Jenkins. Modelling low income transitions. *Journal of applied econometrics*, 19(5):593–610, 2004.

D. Card, R. Chetty, and A. Weber. The spike at benefit exhaustion: Leaving the unemployment system or starting a new job? *American Economic Review*, 97(2): 113–118, 2007.

N. Carnot, M. Kizior, G. Mourre, et al. Fiscal stabilisation in the euro-area: A simulation exercise. Technical report, ULB–Universite Libre de Bruxelles, 2017.

R. Chetty. A general formula for the optimal level of social insurance. *Journal of Public Economics*, 90(10-11):1879–1901, 2006.

R. Chetty. Moral hazard versus liquidity and optimal unemployment insurance. *Journal of political Economy*, 116(2):173–234, 2008.

G. Claeys, Z. Darvas, and G. Wolff. Benefits and drawbacks of European unemployment insurance. *Bruegel Policy Brief*, 0, 2014.

J. Creedy and G. Kalb. Discrete hours labour supply modelling: specification, estimation and simulation. *Journal of Economic Surveys*, 19(5):697–734, 2005.

A. Debels. Transitions out of temporary jobs: consequences for employment and poverty across europe. *Flexibility and employment security in Europe*, pages 51–77, 2008.

M. Del Monte and T. Zandstra. Common unemployment insurance scheme for the euro area. *European Parliamentary Research Service-EPRS, PE*, 510:984, 2014.

J. Delpla. A euro-wide conditional unemployment insurance. In *seminar "EU level economic stabilisers", Brussels, July*, 2012.

O. Denk and S. Königs. *Supporting jobs and incomes: An update on the policy response to the COVID-19 crisis*. 2022.

M. Dolls, C. Fuest, D. Neumann, and A. Peichl. A Basic Unemployment Insurance Scheme for the Euro Area. *ifo DICE Report*, 14(01):55–60, May 2016.

M. Dolls, C. Fuest, D. Neumann, and A. Peichl. An unemployment insurance scheme for the euro area? A comparison of different alternatives using microdata. *International Tax and Public Finance*, 25(1):273–309, February 2018.

S. Dullien. A euro-area wide unemployment insurance as an automatic stabilizer: Who benefits and who pays? Paper prepared for the European Commission (DG EMPL). 2013(January), 2013.

S. Dullien. *A European Unemployment BeneÖt Scheme. How to provide formore Stability in the Euro Zone*. Bertelsmann-Stiftung, 2014.

H. Enderlein and J. Spiess. Blueprint for a cyclical shock insurance (csi) in the euro-area. In *Presentation at the Conference "Let's think out of the box", Brussels*, 2013.

I. Esser, T. Ferrarini, K. Nelson, J. Palme, and O. Sjöberg. Unemployment benefits in eu member states, 2013.

European Commission. *Atypical Employment and the Role of European PES*. Directorate-General for Employment, Social Affairs and Inclusion, Luxembourg: Publications Office of the European Union, 2016, 2016.

European Commission. 'proposal for a council recommendation on access to social protection for workers and the self-employed.'. *COM (2018), 132 final*, 2018a.

European Commission. *Employment and Social Development in Europe 2018*. Luxembourg: Publications Office of the European Union, 2018b.

E. Fabrizi and C. Mussida. Assessing poverty persistence in households with children. *The Journal of Economic Inequality*, 18(4):551–569, 2020.

M. Fana, S. Tolan, S. Torrejón, C. U. Brancati, and E. Fernández-Macías. *The COVID confinement measures and EU labour markets*. 2020.

M. Feldstein. Temporary layoffs in the theory of unemployment. *Journal of political economy*, 84(5):937–957, 1976.

F. Figari, H. Levy, C. Lietz, D. Mantovani, A. Paulus, and H. Sutherland. Euromod: the tax-benefit microsimulation model for the eu. In *1st International Microsimulation Association conference "Celebrating*, volume 50, pages 19–22, 2007.

F. Figari, A. Salvatori, and H. Sutherland. Economic downturn and stress testing european welfare systems. In *Who loses in the downturn? Economic crisis, employment and income distribution*. Emerald Group Publishing Limited, 2011.

M. Filomena and M. Picchio. Are temporary jobs stepping stones or dead ends? a systematic review of the literature. *International Journal of Manpower*, 43(9): 60–74, 2022.

S. Gagliarducci. The dynamics of repeated temporary jobs. *Labour Economics*, 12 (4):429–448, 2005.

M. Gebel. Early career consequences of temporary employment in germany and the uk. *Work, employment and society*, 24(4):641–660, 2010.

J. Goebel, M. M. Grabka, S. Liebig, M. Kroh, D. Richter, C. Schröder, and J. Schupp. The german socio-economic panel (soep). *Jahrbücher für Nationalökonomie und Statistik*, 239(2):345–360, 2019.

R. Grotti and G. Cutuli. xtpdyn: A community-contributed command for fitting dynamic random-effects probit models with unobserved heterogeneity. *The Stata Journal*, 18(4):844–862, 2018.

J. Gruber. The consumption smoothing benefits of unemployment insurance, 1994.

A. J. Hagenaars, K. De Vos, M. Asghar Zaidi, et al. Poverty statistics in the late 1980s: Research based on micro-data. 1994.

W. Hanesch. Reform of temporary agency work and service contracts in germany. *European Social Policy Network Flash Report*, 2017/05, 2017.

J. J. Heckman. Heterogeneity and state dependence. In *Studies in labor markets*, pages 91–140. University of Chicago Press, 1981.

J. Horemans. Atypical employment and in-work poverty: a different story for part-timers and temporary workers? 2017.

J. Horemans. Atypical employment and in-work poverty. In *Handbook on in-work poverty*. Edward Elgar Publishing, 2018.

E. J. Jahn. Reassessing the pay gap for temps in germany. *Jahrbücher für Nationalökonomie und Statistik*, 230(2):208–233, 2010.

H. X. Jara and A. Simon. The income protection role of an emu-wide unemployment insurance system: the case of atypical workers. *CeMPA Working Paper Series*, 2021.

H. X. Jara and H. Sutherland. The implications of an EMU unemployment insurance scheme for supporting incomes. Euromod working papers, EUROMOD at the Institute for Social and Economic Research, Apr. 2014.

H. X. Jara, A. Tumino, and H. Sutherland. The redistributive and stabilising effects of an EMU unemployment benefit scheme under different hypothetical unemployment scenarios. Euromod working papers, EUROMOD at the Institute for Social and Economic Research, Dec. 2015.

H. X. Jara, H. Sutherland, and A. Tumino. The role of an EMU unemployment insurance scheme on income protection in case of unemployment. Euromod working papers, EUROMOD at the Institute for Social and Economic Research, Dec. 2016.

H. X. Jara Tamayo and A. Tumino. Atypical work and unemployment protection in europe. *JCMS: Journal of Common Market Studies*, 59(3):535–555, 2021.

S. P. Jenkins. *Changing fortunes: Income mobility and poverty dynamics in Britain*. OUP Oxford, 2011.

J. C. Juncker, D. Tusk, J. Dijsselbloem, M. Draghi, and M. Schulz. Completing europe's economic and monetary union. 2015.

L. M. Kahn. The structure of the permanent job wage premium: Evidence from europe. *Industrial Relations: A Journal of Economy and Society*, 55(1):149–178, 2016.

L. F. Katz and B. D. Meyer. Unemployment insurance, recall expectations, and unemployment outcomes. *The Quarterly Journal of Economics*, 105(4):973–1002, 1990.

L. F. Katz, A. B. Krueger, G. Burtless, and W. T. Dickens. The high-pressure us labor market of the 1990s. *Brookings Papers on Economic Activity*, 1999(1):1–87, 1999.

N. A. Klevmarken. Micro simulation-a tool for economic analysis. Technical report, Working Paper, 2001.

J. Kolsrud, C. Landais, P. Nilsson, and J. Spinnewijn. The optimal timing of unemployment benefits: Theory and evidence from sweden. *American Economic Review*, 108(4-5):985–1033, 2018.

A. B. Krueger and B. D. Meyer. Chapter 33 labor supply effects of social insurance. volume 4 of *Handbook of Public Economics*, pages 2327–2392. Elsevier, 2002.

A. B. Krueger and A. Mueller. Job search and unemployment insurance: New evidence from time use data. *Journal of Public Economics*, 94(3-4):298–307, 2010.

A. B. Krueger and A. I. Mueller. A contribution to the empirics of reservation wages. *American Economic Journal: Economic Policy*, 8(1):142–79, 2016.

R. Lalive. Unemployment benefits, unemployment duration, and post-unemployment jobs: A regression discontinuity approach. *American Economic Review*, 97(2):108–112, 2007.

R. Lalive, J. Van Ours, and J. Zweimüller. How changes in financial incentives affect the duration of unemployment. *The Review of Economic Studies*, 73(4):1009–1038, 2006a.

R. Lalive, J. Van Ours, and J. Zweimüller. How changes in financial incentives affect the duration of unemployment. *The Review of Economic Studies*, 73(4):1009–1038, 2006b.

C. Landais. Assessing the welfare effects of unemployment benefits using the regression kink design. *American Economic Journal: Economic Policy*, 7(4):243–78, 2015.

I. Lass and M. Wooden. The structure of the wage gap for temporary workers: Evidence from australian panel data. *British Journal of Industrial Relations*, 57 (3):453–478, 2019.

I. Laß and M. Wooden. Temporary employment contracts and household income. *Social Indicators Research*, 147(1):111–132, 2020.

T. Le Barbanchon. The effect of the potential duration of unemployment benefits on unemployment exits to work and match quality in France. *Labour Economics*, 42(C):16–29, 2016.

T. Le Barbanchon, R. Rathelot, and A. Roulet. Unemployment insurance and reservation wages: Evidence from administrative data. *Journal of Public Economics*, 171(C):1–17, 2019.

H. Lohmann. Welfare states, labour market institutions and the working poor: A comparative analysis of 20 european countries. *European Sociological Review*, 25 (4):489–504, 2009.

H. Lohmann and E. Crettaz. Explaining cross-country differences in in-work poverty. In *Handbook on in-work Poverty*. Edward Elgar Publishing, 2018.

D. MacDougall. *Report of the Study Group on the role of public finance in European integration*. EUR-OP, 1977.

N. Marceau and R. Boadway. Minimum wage legislation and unemployment insurance as instruments for redistribution. *The Scandinavian Journal of Economics*, pages 67–81, 1994.

R. Marjolin. Report of the study group" economic and monetary union 1980" and annex i. 8 march 1975.(commonly called the marjolin report). 1975.

I. Marx and B. Nolan. In-work poverty. *Reconciling work and poverty reduction: how successful are European welfare states*, pages 131–57, 2014.

M. Matsaganis, E. Özdemir, T. Ward, and A. Zavakou. Non-standard employment and access to social security benefits. *Social Situation Monitor, Research note*, 8: 2015, 2016.

A. Mertens, V. Gash, and F. McGinnity. The cost of flexibility at the margin. comparing the wage penalty for fixed-term contracts in germany and spain using quantile regression. *Labour*, 21(4-5):637–666, 2007.

R. Moffitt. Unemployment insurance and the distribution of unemployment spells. *Journal of econometrics*, 28(1):85–101, 1985.

S. Moyen, N. Stähler, and F. Winkler. Optimal unemployment insurance and international risk sharing. *European Economic Review*, 115:144–171, 2019.

Y. Mundlak. On the pooling of time series and cross section data. *Econometrica: journal of the Econometric Society*, pages 69–85, 1978.

E. Narazani, U. Colombino, and B. Palma. Eurolab: A multidimensional labour supply-demand model for eu countries. Technical report, JRC Working Papers on Taxation and Structural Reforms, 2021.

OCDE. *The Future of Social Protection*. 2018. doi: https://doi.org/https://doi.org/10.1787/9789264306943-en. URL `https://www.oecd-ilibrary.org/content/publication/9789264306943-en`.

C. O'Donoghue and G. Dekkers. Increasing the impact of dynamic microsimulation modelling. *The International Journal of Microsimulation*, 11(1):61–96, 2018.

S. O'Dorchai, R. Plasman, and F. Rycx. The part-time wage penalty in european countries: How large is it for men? *International journal of manpower*, 2007.

OECD. Rising inequality: youth and poor fall further behind, https://www.oecd.org/social/ oecd2014-income-inequality-update.pdf. 2014.

OECD. *In It Together: Why Less Inequality Benefits All*. 2015. doi: https://doi.org/https://doi.org/10.1787/9789264235120-en. URL `https://www.oecd-ilibrary.org/content/publication/9789264235120-en`.

G. H. Orcutt. A new type of socio-economic system. *The review of economics and statistics*, pages 116–123, 1957.

J. S. O'Connor. Non-standard employment and european union employment regulation. *Non-Standard Employment in Europe*, pages 46–63, 2013.

A. Peichl and S. Siegloch. Accounting for labor demand effects in structural labor supply models. *Labour Economics*, 19(1):129–138, 2012.

S. Rabe-Hesketh and A. Skrondal. Avoiding biased versions of wooldridge's simple solution to the initial conditions problem. *Economics Letters*, 120(2):346–349, 2013.

A. Regoli, A. D'AGOSTINO, T. Grandner, and D. Gstach. Accounting for the permanent vs temporary wage gaps among young adults: Three european countries in perspective. *International Labour Review*, 158(2):337–364, 2019.

G. Rodgers and J. Rodgers. *Precarious jobs in labour market regulation: The growth of atypical employment in Western Europe*. International Labour Organisation, 1989.

S. Rosen. The theory of equalizing differences. *Handbook of labor economics*, 1:641–692, 1986.

N. B. Ryder. The cohort as a concept in the study of social change. In *Cohort analysis in social research*, pages 9–44. Springer, 1985.

M. F. Salgado, F. Figari, H. Sutherland, and A. Tumino. Welfare compensation for unemployment in the great recession. *Review of Income and Wealth*, 60:S177–S204, 2014.

J. F. Schmieder, T. von Wachter, and S. Bender. The Effect of Unemployment Benefits and Nonemployment Durations on Wages. *American Economic Review*, 106(3):739–777, March 2016.

A. Skrondal and S. Rabe-Hesketh. Handling initial conditions and endogenous covariates in dynamic/transition models for binary data with unobserved heterogeneity. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 63(2):211–237, 2014.

S. Spasova, D. Bouget, D. Ghailani, and B. Vanhercke. Access to social protection for people working on non-standard contracts and as self-employed in europe. *A study of national policies. Brussels: European Commission*, 2017.

A. Spermann. The new role of temporary agency work in germany. 2011.

M. Strauss, O. Bontout, G. Lejeune, M. Ciesielska, and R. Di Girolamo. Paper on automatic stabilisers. *European Commission, Brussels*, 2013.

H. Sutherland. Euromod: An integrated european benefit-tax model. Technical report, EUROMOD Working Paper, 2001.

H. Sutherland and F. Figari. Euromod: the european union tax-benefit microsimulation model. *International journal of microsimulation*, 6(1):4–26, 2013.

C. Vacas-Soriano et al. Recent developments in temporary employment: Employment growth, wages and transitions. 2015.

W. Van Lancker. The european world of temporary employment: Gendered and poor? *European Societies*, 14(1):83–111, 2012.

W. Van Lancker. Temporary employment and poverty in the enlarged european union: An empirical and comparative analysis. In *Non-Standard Employment in Europe*, pages 190–208. Springer, 2013.

H. Van Rompuy, J. M. Barroso, J.-C. Juncker, and M. Draghi. Towards a genuine economic and monetary union. 2012.

A. van Soest. Structural Models of Family Labor Supply: A Discrete Choice Approach. *Journal of Human Resources*, 30(1):63–88, 1995.

J. M. Wooldridge. Simple solutions to the initial conditions problem in dynamic, nonlinear panel data models with unobserved heterogeneity. *Journal of applied econometrics*, 20(1):39–54, 2005.

List of Figures

List of Tables

Agathe Simon

Essays on unemployment benefits systems and poverty in Europe

RÉSUMÉ

Cette thèse étudie le lien entre certaines formes d'emploi et la pauvreté en Europe, ainsi que le rôle des systèmes d'assurance chômage dans la protection des travailleurs. Le chapitre 1 étudie le lien entre les travailleurs temporaires et la pauvreté pour le cas de l'Allemagne. Les chapitres 2 et 3 se concentrent sur les systèmes d'indemnisation du chômage en Europe. Le chapitre 2 renseigne sur comment les systèmes d'indemnisation chômage performent pour protéger les travailleurs atypiques en cas de perte d'emploi. Le chapitre 3 étudie l'effet de différentes réformes d'assurance chômage sur la pauvreté, les inégalités et l'offre de travail des individus.

Mots clefs: Systèmes d'allocations chômage; Pauvreté ; Emploi ; Microsimulation ; Modèles structurels d'offre de travail ; Analyse économètrique de données de panel.

RÉSUMÉ EN ANGLAIS

This study examines the link between certain types of employment and poverty in Europe, and the role of unemployment insurance systems to protect workers. Chapter 1 provides evidence on the link between temporary contracts employment and poverty, with a focus on the case of Germany. Chapter 2 and Chapter 3 focuses on unemployment benefit systems in Europe. Chapter 2 examines how unemployment benefit systems perform to protect atypical workers in case of job loss. Chapter 3 study the effects of different reforms of unemployment benefits on poverty, inequalities and labour supply of individuals.

Keywords: Unemployment benefits systems; Poverty; Employment; Microsimulation; Structural labour supply; Panel data analysis