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SIMON SAVŠEK

LABOUR MARKET ADJUSTMENT AND THE ROLE OF INSTITUTIONS

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In memory of my grandfather Stane.

SUMMARY

European economies have changed substantially during the crisis. The shocks hitting some euro area countries were severe, materializing in lower economic activity and growing unemployment rates. Given a substantial amount of stringent product and labour market regulations in some countries, adjustment programmes in a number of European countries prescribed a degree of labour and product market reforms to address the overregulation and make the economies more resilient to macroeconomic shocks. At the same time, workers, trade unions, as well as the unemployed had to adjust their expectations and many vulnerable groups are still in a search for better opportunities.

A key contribution of the thesis is to provide insight into the labour market developments during and after the crisis. As such, the thesis does not discuss long-term labour market trends (e.g. ageing of population, decline in labour share) and other interesting features of labour markets, such as robotisation, automation and digitalisation or increases in income inequality, which are nowadays also studied heavily in the literature. As a matter of fact, the focus of the thesis is quite narrow. It investigates impacts of structural reforms and institutional rigidities on the labour market, where a number of demand and supply side shocks and policies interact.

The thesis first critically discusses the current knowledge and findings on structural reforms and institutional rigidities. Due to many methodological and measurement issues regarding impacts of institutional rigidities and labour market reforms this chapter is needed to better understand and frame the subsequent contribution to science.

In the next chapter, it empirically investigates the importance of rigid institutions across the three adjustment margins (for sectoral wage, employment and hours worked dynamics) under changing financial conditions. In order to do so, the econometric model, which uses the local projection method, has been developed. The main findings are the following. First, contractionary financing shocks are found to depress all three indicators of the labour market. Second, responses are asymmetric depending on the sign of the shock, different in magnitude depending on the sectoral composition, and sensitive to labour market institutions such as employment protection legislation and union density. Finally, labour market institutions seem to mainly affect the relative strength of the adjustment margins and not so much the overall response of the wage bill.

In the following chapter, the main factors underpinning the employment choice in the EU in the aftermath of crisis from a unique micro level dataset are analysed. It should be noted, that the data used in this chapter is a result of a qualitative questionnaire of firms, which were asked to highlight the main obstacles to hiring permanent employees following a severe recession. Being a cross-section, rather than a panel, it can therefore only partially accommodate dynamic labour demand macroeconomic theory. Taking these important considerations on board, the chapter provides the descriptive statistics of the main factors (demand, finance shocks,

uncertainty, skill shortage, high labour costs, taxation, etc.) behind hiring choices and assesses their relative importance from a micro level. To better understand the underlying factors/obstacles, the probit model is used, being augmented with a number of demand and supply side factors, as well as characteristics at firm level. Regarding the main findings, the paper shows that the main factors behind hiring permanent workers in Europe at the end of recessions are high uncertainty, shortage of skilled labour, high payroll taxes, high wages and the risks associated with changes to labour laws. Furthermore, while negative demand and finance shocks negatively affect firms' perceptions of obstacles to hiring, labour market structures and employment composition characteristics are also significant. In particular, the analysis generally shows that firms employing a higher percentage of skilled, permanent and experienced workers face a lower probability of hiring problems. On the other hand, collective wage bargaining arrangements appear to increase it. However, there are some specific hiring obstacles, particularly the skill shortage obstacle, where these general finding no longer hold.

The scientific contribution of the thesis can be evaluated against both, the methodological and policy contribution. The crisis for example revealed the need for using state-of-the-art econometric techniques and relying also on more granular datasets to complement traditional modelling approaches and aggregate data.

As for the methodological contribution in the first empirical paper, the local projection method is used. This method has several advantages compared to the more standard VAR (vector autoregression) approach. Specifically, it is less prone to misspecification, because each period is estimated separately and it can capture non-linearities in the impulse responses. Additionally, a panel set-up with interaction effects between regressors can easily be implemented. At the same time, the method suffers from some disadvantages relative to a VAR specification. The further the horizon of the impulse response, the more likely it is that confidence intervals widen. Furthermore, local projection methods do not account for shocks that materialise between t and t+h, which may bias estimation results, if shocks are one-directional following t and serially correlated. In the context of the analysis, the advantages of capturing possible non-linearities likely outweigh possible disadvantages. These are also reduced by a sufficiently large time dimension of our sample and the limited autocorrelation of our independent variables of interest. The data in this part of the thesis is sector-level. Usually, the literature relies on more aggregated datasets. More disaggregated data is utilized for a number of reasons. First, the transmission of financial shocks in a country-sector panel has not been investigated for the euro area. Second, much of the regulation is sector-specific and cannot be fully reflected in more aggregate indicators. Finally, the sectoral dataset provides us with an opportunity to better control for public sector dynamics and employment composition effects.

In the following chapter, even more granular data is used. In fact, a unique micro survey data is utilized, allowing us to enable a number of interaction channels, which cannot be found in aggregate datasets. For example, the dataset combines a number of firms' (sector, size, ownership of firms, etc.) and employment composition characteristics (skills and tenure of

employees, etc.), as well as labour market characteristics (collective agreements, firm-level wage indexation, employment protection legislation, coverage of collective agreements, etc.) and (firm-level) shocks (demand, finance, cost, etc.). Those can be used in the regressions to augment and better inform the factors underpinning the employment choice. Because of these rich data characteristics, detailed questions on labour market policies can be assessed in a much greater detail compared to aggregate macroeconomic datasets. Regarding the modelling technique, a standard probit model is developed. These types of models are heavily utilized in the literature when using the cross-sectional micro data.

On the policy contribution, the thesis largely confirms, but also extents, the previous findings from the literature. When assessing the importance of financial shocks, previous empirical finding that hours worked are much less effected than employment and real wages are confirmed. Furthermore, and in line with the literature, but with a different methodology, the thesis shows that financial shocks cause asymmetric impacts, which are stronger during the financial turmoil. Regarding the importance of labour market institutions, the results bring a novel finding that labour market institutions mainly affect the relative strength of the adjustment margins and not so much the overall response of the wage bill. This implies that if we are in a regime of very stringent regulation on one margin, firms will try to adjust on other adjustment margins. At the same time, the finding also suggests that labour market institutions, while being very important to shape responses following a financial shock, cannot fully explain aggregate developments.

Regarding the second empirical chapter in the thesis on hiring obstacles in Europe, the paper is the first one trying to explain the relative importance of factors behind employment choice at the end of recessions. So far, those were usually analysed only separately in the literature. In line with previous findings, results show that shocks, alongside with labour market institutions are important in explaining these obstacles. However, findings also suggest that firms' and employment composition characteristics matter and need to be taken into account since they remain significant even after controlling for country and sector effects. Furthermore, the analysis shows that there is no universal set of characteristics, which would explain all factors in the same way. This finding implies that there is no one-size-fits-all policy and therefore labour market policies need to be implemented with great care. When interpreting these results, however, the subjective nature of the questionnaire and the particularities of the exercise need to be recognised.

Keywords: labour market, labour market institutions, structural reforms, financial shocks, regulation, employment creation

POVZETEK

Gospodarstva evropskih držav so se v času ekonomske in finančne krize precej spremenila. Makroekonomski šoki, ki so prizadeli nekatere države, so močno zmanjšali gospodarsko aktivnost in zvišali stopnjo brezposelnosti. Zaradi regulacije na trgu dela in produktov v prizadetih državah so programi pomoči med drugim predpisovali številne strukturne reforme, kar naj bi pomagalo pri odpravi odvečne regulacije in naredilo gospodarstva odpornejša proti makroekonomskim šokom. Poleg tega so morali delavci, delodajalska združenja, sindikati in tudi nezaposleni spremeniti pričakovanja, ljudje v rizičnih skupinah zaposlenosti pa še vedno iščejo boljše priložnosti na trgu dela.

Osrednji namen doktorske disertacije je pridobiti dodaten vpogled v delovanje trga dela v času krize in po njej. Disertacija se tako ne osredotoča na dolgoročne trende na trgu dela, kot sta na primer staranje prebivalstva ali zmanjševanje deleža dela v proizvodni funkciji. Prav tako doktorska teza ne odgovarja na zanimiva vprašanja s področja avtomatizacije, robotizacije in digitalizacije trga dela oziroma povečanja dohodkovne neenakosti. Izpostavlja praktično izključno strukturne reforme in njihove učinke ter analiza vplive institucionalnih togosti na prilagoditve na trgu dela.

V doktorskem delu najprej kritično ovrednotim znanje in prevladujočo metodologijo na področju analize učinkov strukturnih reform ter institucionalnih rigidnosti. Strukturne reforme definiram kot izboljšanje konkurenčnih pogojev prek sprememb pravil in institucionalnih pogojev, v okviru katerih poslujejo podjetja. Institucionalni okvir je definiran kot kompleksen sistem formalnih zakonov, regulacije, postopkov ter manj formalnih dogovorov, pogodb, običajev in norm, ki urejajo socialno-ekonomsko aktivnost in obnašanje ekonomskih subjektov. Strukturne reforme naj bi državam zaradi izboljšane prožnosti pomagale pri izhodu iz krize, stimulirale rast na srednji in dolgi rok ter jih naredile odpornejše proti prihodnjim makroekonomskim šokom. Zaradi številnih metodoloških in meritvenih problemov pri vrednotenju učinkov reform in institucionalnih rigidnosti je tovrstno poglavje nujno za razumevanje doprinosa doktorskega dela k znanosti.

Že v naslednjem poglavju namreč empirično ovrednotim vpliv institucionalnih ureditev na trgu dela zaradi finančnih šokov na tri ključne spremenljivke na trgu dela (sektorska rast plač, zaposlenost in število opravljenih ur). Pri tem uporabim empirični model, ki temelji na metodi lokalne projekcije. Analiza kaže, da negativni finančni šoki vzbudijo negativne odzive na vseh treh preučevanih spremenljivkah. Nadalje se pokaže, da so odzivi na finančni šok asimetrični tako glede smeri in jakosti šoka kot tudi glede na sektor in izpostavljenost različnim institucijam na trgu dela, kot je na primer zakonodaja o zaščiti delavcev ali vključenost v sindikalna združenja. Nadalje pokažem, da so institucije na trgu dela izrazito pomembne predvsem za posamezen prilagoditveni kanal (sektorska rast plač, zaposlenost in število opravljenih ur), ne pa tudi za vpliv na celoten znesek plač, ki ostaja v dobršni meri nespremenjen.

V naslednjem poglavju analiziram najpomembnejše dejavnike pri zaposlovanju delavcev ob koncu recesije v Evropi. Pri tem se zanašam na bazo podatkov, pridobljeno z anketo podjetij v državah EU. Ker gre za anketo, ki se nanaša na zelo specifično obdobje po krizi, hkrati pa vprašanje ni bilo zastavljeno v prejšnjih anketah, je potrebno biti pri razlagi rezultatov posebej previden. Tako na primer ni mogoča neposredna povezava ugotovitev poglavja z dinamično teorijo povpraševanja na trgu dela. V kolikor vzamemo zgornje v zakup, je namen prvega dela tega poglavja opisati ključne probleme pri zaposlovanju delavcev (problem prenizkega povpraševanja po izdelkih podjetja, finančni problemi, neprimerna struktura delavcev, visoki davki ipd.) in analizirati njihov pomen. Z namenom boljšega razumevanja ovir pri zaposlovanju tako razvijem model probit, v katerega vključim številne pojasnjevalne spremenljivke, kot so ponudbeni in povpraševali dejavniki ter značilnosti podjetij in delavcev. Ugotovitve poglavja kažejo, da so glavni dejavniki zaposlovanja v Evropi po krizah visoka negotovost, premalo visoko usposobljene delovne sile, visoki davki na delo, visoke plače ter tveganja, povezana s spremembo delovne zakonodaje. V nadaljevanju pokažem, da poleg povpraševalnih in finančnih šokov, ki negativno vplivajo na zaposlovanje, na proces zaposlovanja pomembno vplivajo tudi institucionalna ureditev in značilnosti podjetij ter delavcev. Analiza v veliki meri kaže, da se podjetja, ki zaposlujejo visoko kvalificirano, za nedoločen čas zaposleno ter izkušeno delovno silo, soočajo z manjšimi problemi pri zaposlovanju. Na drugi strani se podjetja, kjer se pogajanja o plačah odvijajo na ravni izven podjetja, soočajo z večjimi problemi. Kljub temu pa obstajajo nekateri problemi pri zaposlovanju, kot na primer problem visokokakovostnih kadrov, kjer so ugotovitve drugačne.

Doprinos doktorske disertacije k znanosti lahko ovrednotim prek prispevka na metodološki in ekonomsko-politični ravni. Ekonomska in finančna kriza je na primer pokazala, da je za prispevek k ekonomski znanosti izrednega pomena uporaba sodobnih aksonometričnih orodij. Nadalje se je izrazito povečala potreba po preučevanju manj agregiranih podatkov, saj agregatni modeli ne morejo popolnoma pojasniti kompleksnosti gospodarstev.

Glede vrednotenja teze na osnovi uporabljene metodologije uporabljam sodobna ekonometrična orodja v obeh empiričnih delih disertacije. V prvem delu tako uporabljam metodo lokalne projekcije, ki ima glede na bolj standardiziran in večkrat uporabljen model vektorske avtoregresije (VAR) nekatere prednosti. Na primer, uporabljena metoda je manj občutljiva za nepravilno specifikacijo modela, saj je vsako obdobje ocenjevanja izračunano posebej. Prav tako lahko v analizi zajamem nelinearne učinke šokov, česar osnovna metodologija VAR ne zmore. Ne nazadnje pa je ta metoda zelo prilagodljiva, saj omogoča zajemanje interakcijskih učinkov med spremenljivkami, kar je še posebno primerno za panelno strukturo podatkov, ki jo uporabljam. Na drugi strani metoda lokalne projekcije ne more ovrednotiti šokov, ki se zgodijo med obdobjem t in t + h, kar lahko povzroči nekonsistentnost ocene. Prav tako se z daljšanjem obdobja projekcije po navadi povečujejo intervali zaupanja. V mojem primeru prednosti odtehtajo potencialne slabosti, saj te rešujem z dovolj dolgo serijo podatkov in majhno avtokorelacijo neodvisne spremenljivke. V tem delu empirične analize

uporabljam sektorsko specifične podatke, ki imajo določene prednosti v primerjavi z bolj agregatnimi podatki. Prvič, tovrstni podatki za transmisijo finančnih šokov še niso bili uporabljeni. Drugič, večina regulacije na trgu dela in produktov je sektorsko specifična, zato je bolj agregatni indikatorji ne morejo zaobjeti. Tretjič, takšni podatki omogočajo boljšo razmejitev med zasebnim in javnim sektorjem oziroma da se bolje ovrednoti učinek sestave delovne sile na plače.

V drugem delu uporabljam anketne podatke podjetij iz EU. V tem primeru gre za mikro podatke, ki omogočajo natančnejšo analizo nekaterih komponent trga dela, ki jih agregatni podatki zaobidejo. Na primer, podatki vključujejo številne značilnosti podjetij in delavcev (sektor delovanja podjetja, lastniška struktura, izobrazba in delovne izkušnje zaposlenih itd.), institucionalne značilnosti države, v kateri delujejo podjetja (doslednost delovnopravne zakonodaje, indeksacija plač, vključenost v sindikate ipd.), kot tudi nabor makroekonomskih šokov (povpraševali, finančni, stroškovni ipd.), ki jih lahko vključim v model ter tako izboljšam njegovo uporabno vrednost. To hkrati pomeni, da mi tovrstni modeli omogočajo širši vpogled v delovanje na trgu dela, kar je z bolj agregatnimi ekonomskimi modeli težje doseči. V tem delu poglavja uporabim standardni model probit, ki je sicer standard pri analizi mikro podatkov. Kot rečeno pa je potrebno biti pri analizi anketnih podatkov posebej previden, saj se ti nanašajo na specifično obdobje in se zato nekoliko oddaljujejo od dinamične makroekonomske teorije dejavnikov povpraševanja na trgu dela. Prav tako pa ne gre prezreti specifičnosti vprašalnika, ki je podrobneje pojasnjena v tem poglavju.

Disertacija v veliki meri potrdi in hkrati razširi nekatere nasvete ekonomski politiki. Z novo metodologijo v prvem raziskovalnem poglavju na primer potrdim empirično ugotovljeno dejstvo, da se za razliko od plač in zaposlenosti opravljene delovne ure najmanj odzivajo na finančne šoke. Nadalje v skladu s prevladujočo literaturo ugotovim, da so učinki finančnega šoka asimetrični in močnejši v primeru negativnih finančnih šokov. Novo pa je recimo spoznanje, da striktnost institucij na trgu dela pomembno vpliva na transmisijo finančnega šoka. Ta se razlikuje predvsem znotraj posameznih prilagoditvenih kanalov (plače, opravljene ure, zaposlenost), ne pa tudi v smislu celotne mase plač. To pomeni, da podjetja optimizirajo svoje odločitve tudi glede na to, kateri prilagoditveni kanal je zanje manj težaven. Slednje pa vodi do spoznanja, da kljub izrednemu pomenu, ki ga lahko pripišemo institucijam na trgu dela, te ne morejo popolnoma pojasniti agregatnih makroekonomskih dogajanj na trgu dela.

Tudi drugo empirično poglavje prinaša nekatere nove nasvete ekonomski politiki. Analiza je tako ena prvih, ki ovrednoti relativno pomembnost dejavnikov zaposlovanja. Čeprav so številni pred nami že ovrednotili dejavnike pri zaposlovanju, mi nabor podatkov omogoča, da lahko te analiziram znotraj identičnega nabora podatkov ter tako določim njihovo relativno pomembnost. V skladu s preteklimi spoznanji v tem delu pokažem, da so makroekonomski šoki in institucije ključnega pomena pri pojasnjevanju teh dejavnikov. Hkrati pa analiza prinaša tudi spoznanje, da so značilnosti podjetja ter zaposlenih prav tako pomembne pri pojasnjevanju ovir. Ne nazadnje pa analiza pokaže, da ni enoznačnih značilnosti, ki bi lahko vse dejavnike

pojasnile na enak način. Slednje pa pomeni, da ne obstaja univerzalna ekonomska politika, s katero bi lahko rešili vse probleme pri zaposlovanju, zato je treba biti pri spreminjanju institucij na trgu dela prek strukturnih reform še posebno previden.

Ključne besede: trg dela, institucije trga dela, strukturne reforme, finančni šoki, regulacija, zaposlovanje

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INTRODUCTION

The financial and sovereign debt crisis had important consequences for the European economies. The severity of shocks hitting some of them was very substantial, materializing in lower economic activity and increasing unemployment rates. The latter rose from just above 7% in 2008 to 12% in 2013 in the euro area, while cross-country and cross-sector heterogeneity also drastically increased. At the same time, the most severely hit countries in Europe were required to subscribe to adjustment programmes, which included a number of tasks, ranging from banking sector recapitalizations, stringent fiscal consolidation processes and structural reforms. Not only businesses and countries needed to adjust to the new environment. Employees, trade unions, as well as the unemployed, had to adjust their expectations. Some were willing or needed to accept lower entry wages or short-term contracts, while some profiles of workers, such as construction workers in some countries, became structurally unemployed. Additionally, some vulnerable groups, such as young people, are still in search of better opportunities even some years following the crisis. Finally, automation, digitalisation and robotisation started to shape macroeconomic developments and are expected to drastically change the functioning of labour markets in the future.

Structural reforms are typically defined as pro-competitive changes to the rules and institutions governing labour and product markets, but sometimes even broader. I define institutions as a system of formal laws, regulations, procedures, informal conventions, customs and norms, which shape socioeconomic activity and behaviour in the economy. When discussing structural reforms, policy makers argue that those are needed to address the overregulation of labour and product market institutions by fighting the red tape, generating friendly business environment and making the economies more resilient to macroeconomic shocks. According to some estimates structural reforms could boost the collective GDP of G20 countries by 2 per cent in five years' time (OECD & IMF, 2014). From these definitions, it almost follows that structural reforms are a universal cure and should be implemented at all times. However, the implementation of reforms in Europe in recent years does not confirm this statement. Why is this then the case?

First, it is worth noting that structural reforms are usually undertaken as a matter of urgency, i.e. in an environment of weak aggregate demand conditions where all other policies are already constrained. This led some researchers to argue that the short-term costs of reforms might outweigh the expected long-term benefits in this case (Eggertson, Ferrero & Raffo, 2014). This opened an important policy debate – Should countries in Europe stimulate reform agendas at all? Second, while potential costs of reforms are usually observable in the short run and concern a much more homogenous group, the long-term benefits are accumulating slowly and are more spread out. Therefore, what can we realistically expect from reforms in the short-term vs. the long-term? Third, there are a number of stakeholders, who prefer the status quo and feel resistance to change. So, the follow up to this statement is the question: If we know structural

reforms are generally good, how to stimulate reforms in Europe also in good times and how to tackle resistance to change from vested interests?

A key contribution of the PhD thesis is to provide insight into the labour market developments during and after the crisis and try to answer the above questions. In particular, the thesis investigates impacts of structural reforms and institutional rigidities on labour markets in Europe. As such, the scope of the thesis is quite narrow and the dissertation does not discuss long-term labour market trends (ageing of population, declining labour share, etc.) and other interesting features of labour markets, such as automation, robotisation and digitalisation.[1] In the next paragraphs, the motivation and structure of the thesis is presented, followed by research questions, scientific contribution, data and the structure of the thesis.

The opening chapter sets up the scene. It critically discusses the current knowledge and findings on structural reforms and institutional rigidities. The goal of this chapter is to give a broad overview of the relevant literature on the impact of reforms, focusing mostly on labour markets, which is the central topic of the thesis. The chapter provides a selective survey of vast literature from various disciplines, including empirical labour economics and macroeconomics. In doing so, it discusses different approaches that have been used to measure the reforms and their impacts, both from the empirical and theoretical perspective. Empirical approaches to estimating the impact of structural reforms are first discussed, including ways to correct for endogeneity of reforms. Theoretical approaches follow, with a focus on DSGE models. The chapter draws the following tentative conclusions. First, with the development of new databases and modelling approaches, researchers and policy makers have become increasingly more confident about impacts of structural measures. However, with empirical work it is still hard to identify and disentangle the causal effects of reform measures due to selection bias and a wide range of confounding factors, which are discussed in detail in this chapter. Second, short-term impacts of reforms are potentially more difficult to measure in the first place, while reforms are carried out to affect the long-run steady state of the economy. Therefore, their short-term impacts should be interpreted with more caution. Finally, the question on how to build institutions that will help bring about a sense of reform urgency also in normal times is most probably the most difficult to answer. It seems that the bundling of reforms and accommodating demand side policies may facilitate the adoption of reforms. Apart from this, further work is needed to investigate deeper the supply side issues.

The thesis addresses some remaining gaps in the literature with the following two empirical chapters. In the first one, the importance of rigid institutions for adjustment margins (sectoral real wage, employment and hours worked) dynamics when economies are hit by financial shocks is analysed. To give a good approximation of shocks, two market-based indicators,

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[1] Apart from numerous papers produced on these topics from policy institutions, such as the IMF, OECD, ILO, World Bank, ECB, EIB and European Commission, some recent articles, for example, include Acemoglu and Restrepo (2017a, 2017b, 2018) and Bührer and Hagist (2017).

which resemble well the financial market developments in the euro area countries, are used. The first measure concerns sovereign debt yield spreads and its validity is crosschecked with changes in banking loans. In the following, the responses of adjustment margins to positive and negative financial shocks via the local projection method as proposed by Jordà (2005) and further refined by Auerbach and Gorodnichenko (2013) are drawn. The local projection method has several advantages over the more standard VAR approach and is more useful for the research question. Specifically, it is less prone to misspecification, because each period is estimated separately and it can capture non-linearities in the impulse responses. Those might be present due to the long time series, which covers tranquil and crisis periods.

There is also no *a priori* reason to expect that impacts of financial shocks should be symmetrical as a standard VAR would assume. Additionally, a panel set-up with interaction effects between regressors can easily be implemented. This is particularly useful for the analysis, since in the second stage, financial shocks are interacted with the two labour market institutions (EPL and union density). While the impact of stringent labour market institutions for the propagation of financial shock has already been studied from the theoretical and empirical perspective this analysis is the first that draws the impulse response functions with the local projection method using the country-sectoral panel, which addresses all three possible adjustment margins simultaneously. In the literature, usually only one or two were addressed at the same time. Concentrating on all three adjustment margins at the same time allows assessing the relative importance of labour market adjustment channels and comment on how the two labour market institutions shape the asymmetries in the impulse response functions. To my knowledge, this is the first paper trying to establish such relationships.

The second empirical chapter discusses the main factors underpinning the employment choice in Europe following the financial crisis. This part relies on a micro WDN dataset, which is a questionnaire of about 26,000 firm-level observations from a large majority of the EU countries. The third round of survey asked firms about their characteristics (size, ownership, establishment, sector etc.), together with their labour cost adjustment strategies. The questionnaire, for example, allows distinguishing between the main channels of adjustment (wage/employment/hours worked, prices) and asks about perceptions regarding the current and previous economic conditions, distinguishing between the demand and supply-side factors. In particular, the following question is taken into consideration as the main scientific question of the analysis "How relevant is each of the following factors as obstacles to hiring workers with a permanent, open-ended contract at the end of 2013?" Firms responded to the question with a number of pre-written choices (uncertain economic conditions, shortage of skilled labour, limited access to finance, high wages, etc). Therefore, the cross-sectional nature of the data should be recognized. Furthermore, the scientific question can only partially accommodate dynamic labour demand macroeconomic theory and has, as such, a limited answer to the overall optimality of employment choices. In addition, augmenting regressions with quantitative firm-level data, such as balance sheet information, would further increase the validity of results. However, this was not possible in the context of my analysis.

Taking all of the above aspects into consideration, the descriptive part of the chapter provides a snap shot of answers to this particular question by country, sector and size and checks which factors are the most relevant for hiring at the end of recessions. In the following, an empirical probit model is developed, estimated with the maximum likelihood method. A useful reference for the methodological part of this chapter is a study from the previous WDN wave by Druant et al. (2009). The micro level data augments the model with a number of explanatory variables, such as shocks, firm and employment composition characteristics, as well as labour market institutions and therefore projects what they have to say about the hiring factors. Using the same model, the indirect links with the structural reform activity across the EU is established in the final part of the chapter. The dataset provides a unique opportunity to differentiate across a number of factors underpinning the employment choice and assess their relative importance. The analysis shows that shocks, institutions, but also firm-level characteristics, such as employment composition, matter in determining labour market outcomes, while previous studies mostly concentrated on the first two. Furthermore, these characteristics do not uniformly explain our variables of interest. Finally, further tentative evidence on the perceived impacts of labour market reforms across European countries is provided in this empirical chapter.

Research questions

Research questions posed in the thesis can be differentiated between the following dimensions. One could distinguish the research questions addressed in the literature review and in the empirical part separately. However, as the original contribution to science is made in the empirical part, only elaboration on those is made below. This part can be further split into the methodological research questions and policy-related research questions.

Regarding the former, the following stand out as the most relevant:

- Do more disaggregated datasets improve upon more aggregated datasets, when measuring impacts of reforms and institutions?
- Are there asymmetries in the propagation of financial shocks, which, for example, could not be assessed by the standard (VAR) methodology?

Regarding the policy-relevant research questions, the most obvious are listed below:

- How do financial shocks propagate when differentiating between strict and flexible labour market institutions?
- Do institutional rigidities cause relative shifts across the adjustment margins, or do they also affect the aggregate propagation mechanism of financial shocks?
- What are the main factors underpinning the employment choice after recessions in Europe and what is their relative importance?
- Is there a set of universal characteristics which help us to explain these factors uniformly?
- Does the analysis bring any tentative conclusions on impacts of labour market reforms?

Scientific contribution

While the first chapter is of a purely descriptive nature and tries to bring together the major findings regarding impacts of reforms and institutions on labour markets, the scientific contribution should therefore be assessed for the following two empirical chapters. There, the scientific contribution of the thesis can be evaluated against both, the methodological and the policy contributions.

Regarding the methodological contribution in the first empirical paper, the novel approach used is the local projection method. This method has several advantages compared to the more standard VAR (vector autoregression) approach. Specifically, it is less prone to misspecification because each period is estimated separately.

On the other hand, VARs are estimated recursively and therefore more prone to misspecification since errors accumulate between periods. Moreover, local projection method can capture non-linearities in the impulse response functions. Finally, a panel set-up with interaction effects between regressors can easily be implemented, which is actually needed to address scientific questions in the thesis. Regarding the data in this part of the thesis, sector-level data is utilised. Typically, the literature relies on more aggregated datasets, while in this chapter the use of sectoral data can solve a number of issues simultaneously. First, the transmission of financial shocks in a country-sector panel has not been investigated for the euro area. Second, much of the regulation is sector-specific and cannot be fully reflected in more aggregate indicators. Finally, the sectoral dataset provides us with an opportunity to better control for public sector dynamics and employment composition effects.

On the policy contribution of this chapter, results largely confirm and extent the previous findings in the literature. When assessing the importance of financial shocks in the first empirical paper, analysis confirms previous empirical findings that hours worked are much less effected than employment and real wages. Furthermore, and in line with the literature, but with a different methodology, it shows that financial shocks cause asymmetric impact, which is stronger during the financial turmoil. Regarding the importance of labour market institutions, the results bring a novel finding that labour market institutions mainly affect the relative strength of the adjustment margins and not so much the overall response of the wage bill. This implies that if we are in a regime of very stringent regulation on one margin, firms will try to adjust on other adjustment margins. At the same time, this finding also suggests that labour market institutions, while being very important to shape responses following a financial shock, cannot fully explain aggregate developments.

The second empirical paper makes the following contribution to the existing literature. First, the dataset provides a unique opportunity to differentiate across a number of factors underpinning the employment choice at the same time, while in the empirical literature authors usually tackled these one by one. Particularly, the WDN dataset combines a number of firm-level labour market characteristics, as well as shocks at firm level, from the same data source.

As compared to standard macroeconomic models, those can augment and better inform the model. Because of this rich dataset, detailed questions on labour market policies can be assessed in much greater detail compared to the aggregate macroeconomic datasets. Second, even though factors behind hiring decisions were listed before in empirical and theoretical literature, the analysis is among the first ones to provide an assessment of the relative importance. Third, results show that shocks, institutions, but also other characteristics, such as employment composition, do matter in determining labour market outcomes. In fact, the analysis shows that these characteristics do not uniformly explain our variables of interest. Finally, this chapter also provides further tentative evidence on the perceived impacts of labour market reforms in Europe.

The methodology used in this part of the thesis is a probit, which is a very standard model when dealing with micro datasets. These models are, as in this case, usually estimated by means of maximum likelihood. It should be noted, however, that the data utilized in this chapter is a result of a qualitative questionnaire of firms, which were asked to highlight the main factors behind hiring permanent employees at the end of severe recession. Being a cross-section, rather than a panel, the data can therefore only partially accommodate dynamic labour demand macroeconomic theory. Finally, augmenting regressions with quantitative data, such as balance sheet data of firms´, which was not possible in the context of this analysis, would further improve the validity of results.

Data

The data used in the first empirical paper is a country-industry panel dataset for 15 euro area countries and the four main sectors of the economy (construction, manufacturing, services and public services). The dependent variables (real wages, hours worked and employment) are constructed using ESA 2010 data from Eurostat. The control variables, sectoral gross value added and the GVA deflator, are also taken from the Eurostat ESA 2010 dataset. Data on temporary and part-time work is obtained from the European Labour Force Survey. The two measures of labour market institutions are a sector-specific indicator of employment protection legislation (EPL), which is constructed using the OECD indicator of EPL for permanent work. The second measure of labour market institutions is a sectoral union density measure reported in the ICTWSS database (Visser, 2015), which are aggregated to sub-sectors to match the NACE 2 definitions. In addition, both measures of labour market institutions are linearly interpolated to obtain quarterly series. Financial conditions are measured by the loans dynamics, which are taken from the ECB and reflect the total outstanding stock of loans to the domestic economy. The spreads are also calculated from the ECB database and reflect the country-specific spread over the 10-year sovereign debt securities of Germany.

As already said above, in the second empirical paper, the most recent vintage of the WDN dataset is used. The third wave of the survey (WDN3) was undertaken in 2014-15 among the 25 participating European System of Central Banks and surveyed about 25,000 firms in Europe.

Given the fact that this is a questionnaire, subjective nature of survey has to be kept in mind. That is why the firms' perceptions need to be taken into account and not the actual, quantitative, data. At the same time, the sample is restricted to firms, which have successfully coped with the crisis. Therefore, the nature of the questionnaire allows us to judge on the bias of our results explicitly, i.e. firms that did not successfully cope with the crisis had more obstacles to hiring as those that are included in the survey since shocks and supply-side obstacles forced them out of the market. Being a cross-section, rather than a panel, it can therefore only partially accommodate dynamic labour demand macroeconomic theory. That is why for policy purposes the results need to be even more carefully considered.

Structure of the thesis

The structure of the thesis is the following. Chapter 1 is the literature review. Two empirical papers follow. Chapter 2 studies the responses of labour market adjustment margins to financial shocks. Chapter 3 lists and investigates obstacles to hiring after recessions in Europe. Last chapter draws conclusions and policy messages. A longer summary in Slovenian language, in the Appendix, concludes.

1 A REVIEW OF THE LITERATURE [2]

1.1 Introduction

The slowdown in trend growth rates following the global recession and the European sovereign debt crisis and the constraints surrounding demand side policies have spurred interest in structural reforms. Structural reforms are typically defined as pro-competitive changes to the rules and institutions governing labour and product markets (but sometimes broader). While the leeway for demand side policies was considered limited, in recent years policymakers have often called for the introduction of deep-seated changes in the functioning of product and labour markets. According to some estimates such reforms could boost the collective GDP of G20 countries by 2 per cent in five years' time (OECD & IMF, 2014). Similarly, as noted in the Introduction, ECB President Mario Draghi frequently ended his introductory statements at press conferences following the ECB's Governing Council's with a call for structural reforms to boost growth and resilience of Eurozone economies (ECB, 2015).

These high expectations from structural reforms raise various critical questions, including:

- How can we properly measure reforms?
- What can we realistically expect from reforms in the long run?
- How can we identify in practice what gains can be attributed to reforms?
- Do structural reforms lead to immediate gains, or can they imply short-run transitional costs?

The goal of this chapter is to give a broad overview of the relevant literature on the impact of reforms, focusing particularly on labour markets (hence excluding product markets and issues like education, the quality of government spending, etc.). To this end it provides a selective survey of a large literature from various disciplines, including empirical labour economics and macroeconomics. In doing so, it will also discuss different approaches that have been used to assess the impact of reforms, both empirical and theoretical. Several dimensions of structural reforms are not discussed in greater detail in this literature review.[3]

This chapter is set-up as follows. The next section provides an overview of approaches used to measure the impact of reforms, including a discussion of how empirical studies have dealt with the issue of endogeneity. Section 1.3 then discusses the results of empirical approaches to measure the impact of reforms, distinguishing between micro-based studies that tend to concentrate on a single reform and cross-country studies that often look at a series of reforms.

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[2] This chapter closely follows Parlevliet,Savšek & Tóth (2018).
[3] For example, studies using changes in measures of economic freedom as a proxy for reform, are neglected to a large extent (see de Haan, Sturm & Lundstrom, 2006, for a discussion).

Section 1.4 discusses the outcomes of theoretical approaches (mainly DSGE models). Section 1.5 briefly discusses the political economy of reforms. Finally, section 1.6 concludes.

1.2 Approaches to measuring the impact of reforms

A large literature has related labour market reforms to macroeconomic outcomes such as employment, productivity and GDP growth. We first discuss empirical approaches to estimating the impact of structural reforms, including ways to correct for endogeneity of reforms. We then continue with theoretical approaches, with a focus on DSGE models.

1.2.1 Empirical studies and the issue of endogeneity

There is a vast empirical literature linking institutions or reforms to macroeconomic outcomes, both at the country level and across jurisdictions. Country studies typically look at the impact of a single institution or reform, such as the retirement age or the duration of unemployment benefits. Cross-country studies often look at series of reforms jointly, often using indices developed by the OECD.

Empirical studies aiming to identify the causal effects of reforms have to overcome several methodological issues. Of these, the endogeneity of reforms is perhaps the most serious. A large body of literature has established that institutions, such as labour laws, are not exogenous (or randomly assigned across countries) but are the result of historical specificities and social preferences. For instance, the legal origins of a country have an important influence on the regulation of employment contracts (Campos & Nugent, 2012). Endogeneity is also an issue when the focus is on measuring the impact of changes to institutions over time, or reforms. Structural reforms are typically preceded by adverse economic conditions that create a political-economy environment where the introduction of reforms is more likely. For instance, a large body of literature has found that economic and financial crises facilitate the adoption of reforms (see Section 1.5 of this chapter).

Various approaches have been proposed to deal with this endogeneity issue. In micro-econometric studies, the state of the art is to use or attempting to imitate a natural experiment for identification. For instance, researchers have exploited arbitrary discontinuity in policies ("regression discontinuity design") (see e.g. Lalive, 2007). Furthermore, when an institution is not binding to the same extent for all sectors, a difference-in-difference specification allows deriving the effect of policies on the basis of variation between sectors (see e.g. Bassanini, Nunziata & Venn, 2009; Bourlès, Cette, Lopez, Mairesse & Nicoletti, 2013).

Moreover, when a variable can be found that correlates with the reform but not with the observed outcomes under study, an instrumental variable estimation is possible. For instance, Griffith, Harrison and Simpson (2010) instrument the EU Single Market reforms with its ex ante estimated impact. An alternative route can be a treatment-effect approach involving a two-

stage estimation procedure. For instance, Bordon, Ebeke & Shirono (2018) first estimate the probability of implementing structural reform with the probit model and then use these treatment effects of reforms in a second stage regression to correct for selection bias and evaluate more precisely the economic effects of labour and product market reforms.[4]

There are also some other challenges to estimate the impact of reforms. First of all, there can be non-linearities or threshold effects in the relationship between institutions and outcomes. For instance, very long duration of unemployment benefits has been found to diminish job search and increase unemployment duration (Lalive, 2007). At the same time, very short unemployment benefits may lower the efficiency of the subsequent job match and as such productivity (Caliendo, Tatsiramos & Uhlendorff, 2013). Similarly, it has been proposed that some employment protection can raise economic growth up to a certain level, but deterring economic growth when it becomes very rigid (Belot, Boone and van Ours, 2007). Country studies can, in principle, deal more accurately with such threshold effects than aggregate studies.

Secondly, the impact of certain policies may depend on the wider institutional context. For instance, Bassanini and Duval (2006, 2009) find that active labour market policies can reduce the negative employment effect of generous unemployment insurance while Murtin, de Serres and Hijzen (2014) find that a high tax wedge is especially detrimental to employment in the presence of collective bargaining coverage extensions. Cross-country studies can to some extent control for the wider institutional context by including a series of institutions and institutional interaction terms. Unfortunately, there is not usually enough variation in the cross-country data to test for all possible policy interactions (Bassanini & Duval, 2009).

Finally, proper measurement of reforms can be a challenge. Cross-country studies typically rely on OECD indicators to measure changes in structural policies as, for example, in most OECD studies such as the one by Égert and Gal (2018). One important advantage of this approach is that reform indicators are standardized across countries and can be therefore widely-used in empirical cross-country applications. However, as these indicators typically quantify legislation as opposed to implementation they inevitably contain some measurement error. For instance, for institutions such as the minimum wage and employment protection the gap between de jure and de facto practices can be rather large (see e.g. Boeri & Jimeno, 2005; Venn, 2009). To address this issue, the narrative approach is sometimes utilized in empirical studies instead. For example, this approach is used in Duval, Furceri, Hu, Jalles and Nguyen (2018), who identify the precise date of reform implementation and construct a broader cross-country and time-series coverage. However, the narrative approach incorporates at least some degree of subjectivity

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[4] Researchers have also used several other econometric techniques to deal with endogeneity. Bassanini and Duval (2006) estimate their model using a GMM specification in which policies/institutions are instrumented with their lags. Furthermore, thresholds can be imposed to lower the risk of endogeneity. For instance, Bouis et al. (2012) model a structural reform as a change in the institutional variable by at least two standard deviations of the average annual change. Focusing solely on these large "reform episodes" can limit endogeneity issues.

when deciding, for instance, on a significance of the reform measure. And while employment and unemployment can be measured adequately, this is not the case for all metrics of labour market outcomes. For example, Bils (1985) and Solon, Barsky & Parker (1994) have argued that cyclical changes in the composition of employment may explain the apparently a-cyclical evolution of real wages. Properly controlling for such composition effects requires detailed micro-data (see e.g. Carneiro, Guimarães & Portugal, 2012). Furthermore, in aggregate data it is sometimes difficult to recognize and differentiate between the impacts of policies that may have observationally equivalent effects over the short run. For example, during the recent crisis, several euro area countries implemented substantial reform measures, but at the same time were also pursuing fiscal consolidation which makes it difficult to disentangle the impact of reforms.

1.2.2 Structural model based approaches

Structural model based - or theoretical - approaches to investigate the impact of structural reforms are an important complement to the empirical approaches. In these approaches the causal link between reforms and outcomes is not measured but assumed, thus – to the extent the underlying models are good enough approximations of the economies in question – endogeneity and confounding factors are less of an issue. While these approaches are not necessarily well suited to measure the exact quantitative impact of reforms, they can shed light on key propagation mechanisms and policy interactions at play.

Nowadays, the vast majority of theoretical literature adopts DSGE models. The most widely used DSGE models typically feature monopolistic competition a là Stiglitz-Dixit in both the goods and the labour markets. As a result, goods are priced with a mark-up over marginal costs and wages are characterized by a mark-up over the marginal rate of substitution between consumption and hours. In these models, structural reforms are typically captured as permanent negative shocks to mark-ups, representing more competition in product and labour markets resulting in higher output/employment and a lower price/wage level. Such an approach towards modelling the impacts of structural reforms is for example employed in in't Veld, Varga and Roeger (2018), Pierluigi and Vetlov (2018) and Jacquinot, Savšek, Tóth and Vetlov (2018). Thus, in DSGE frameworks reforms can be seen as measures aiming at reducing the distance to the frictionless first best allocation. While shocking price and wage mark-ups may be a crude way of capturing complex product and labour market reforms, it can be thought of as a first approximation which captures a key element of most structural reforms: enhancing competition. However, product and labour markets often feature a complex web of interacting institutions, thus a model featuring price and wage mark-ups as the only imperfections targeted by structural reforms may provide limited insight into real world policy challenges.

By introducing more complex underlying rigidities and propagation mechanisms the impact of more specific structural reforms and more complex interactions can also be analysed. In this spirit, instead of relying on price and wage mark-ups, Cacciatore, Duval, Fiori & Ghironi (2016) consider a DSGE model with labour market search. In their framework the number of producers

is endogenized through fixed cost of entry. Mark-ups depend endogenously on the number of firms in the markets through a demand-side mechanism. In this case the effect of a reform aimed at improving competition is simulated assuming a reduction in entry costs which boosts entry and reduces mark-ups. Thus, with respect to earlier studies the reduction in mark-up has a deeper economic meaning and more grounded micro-foundations. Likewise, Colciago (2018) endogenizes both the number of producers and the unemployment rate. Price mark-ups are endogenously determined through a supply side mechanism, namely by introducing oligopolistic competition between the endogenous numbers of producers. Furthermore, Jimeno and Thomas (2013) capture collective bargaining mechanisms via sector level wage fixing in a context where firm-worker pairs are subject to idiosyncratic productivity shocks. Of course, it is not only complexity that matters; in order to provide valid results, the frictions introduced in the model need to be relevant to the structural problem at hand.

It is worth noting that there are strong complementarities between theoretical and empirical approaches. In particular, the empirical literature on the impact of structural reforms can provide a first point of reference for calibrating theoretical models, in terms of coefficients, shock sizes and impulse responses. For example, disaggregated data can be used to estimate the impact of product market regulation on service sector mark-ups (see e.g. Thum-Thysen & Canton, 2015), which in turn can help the calibration of the size of a non-tradable sector mark-up shock in response to an assumed regulatory change in a DSGE model. Empirical results are also crucial for creating a mapping between real-word reform measures and the shocks DSGE models can interpret.

1.3   An overview of results from empirical studies

1.3.1   Micro-level evidence

A large body of micro-econometric studies has studied the impact of institutions and reforms on unemployment and productivity. It is not in the scope of this chapter to review this literature in detail (see Jaumotte, 2011; Boeri & Van Ours, 2013; Blanchard, Jaumotte & Loungani, 2014 and Boeri, Cahuc & Zylberberg, 2015 for recent reviews). Rather, in this section, we highlight some main conclusions. Overall there is important association between labour and product market reforms. For example, Cette, Lopez and Mairesse (2014) disentangle the effects of product market regulation (higher rents) and employment regulation (higher rent sharing of workers) on productivity growth. For most countries, the gains from product market deregulation outweigh those of employment protection deregulation.

Second, generous unemployment benefits (in both duration and its conditions) have been found to increase employment duration and as such raises unemployment (Tatsiramos & Van Ours, 2014). At the same time, evidence from Germany indicates that very short benefits may hurt the quality of the subsequent job match (Caliendo, Tatsiramos & Uhlendorff). With data from

Austria, Lalive (2007) does not find an effect on job quality although short benefits may reduce the odds of transition into regular jobs.

Furthermore, evaluating European policies that reduced the retirement age with the aim of alleviating youth unemployment, Gruber and Wise (2010) do not find that the earlier exit of older workers has supported the employment prospects of the young. In turn, raising retirement age has been found to boost employment, also in the short run (Cribb, Emmerson & Tetlow, 2014).

Fourth, high tax wedges reduce labour demand and supply and can as such reduce employment rates. On the demand side, high taxes increase cost for firms. On the supply side, they reduce take-home pay, impacting negatively labour supply. These distortions are also affected by the progressivity and different schemes of household income taxation (Eissa, 1995; Disney, 2000; Jongen, de Boer & Dekker, 2015).

In addition, a high minimum wage can reduce employment prospects especially for the young and lower-skilled. At the same time, in case of strong bargaining power of employers vis-à-vis low-skilled workers, a minimum wage can improve earnings without compromising employment (see Boeri & Van Ours, 2013 and Boeri et al., 2015).

Probably most controversial is the role of employment protection legislation and collective wage bargaining. As to the first, stringent employment protection legislation (EPL) can be expected to dampen both job separations and hiring rates. In line with this, cross-country studies initially found ambiguous effects on employment and unemployment (e.g. OECD, 2004). More recently however, micro-based work – which in principle can more accurately identify causal effects – found some employment effects. For instance, exploiting a difference-in-difference setting for American states Autor, Donohue and Schwab (2006) report a negative effect from wrongful discharge law on employment rates. Yet, micro-based results for other countries indicate no robust effects on employment or employment flows (see e.g. Bauer, Bender & Bonin, 2007 for Germany and Von Below & Thoursie, 2010 for Sweden and Martins, 2009 for Portugal). On the other hand, Hijzen, Kappeler, Pak & Schwellnus (2018) find that stricter EPL makes the unemployment rate more sensitive to shocks directly by promoting the use of temporary contracts, thereby reducing labour market resilience.

Furthermore, there is evidence that EPL deters firm growth. Exploiting a 1990 reform in Italy that increased EPL for smaller firms, Schivardi and Torrini (2008) find that small firms were more likely to remain small. For the same reform, Cingano, Leonardi, Messina and Pica (2016) show that higher EPL resulted in an increase in the capital-labour ratio and a decline in total factor productivity in small firms relative to larger firms. Furthermore, several studies have confirmed that EPL influences the composition of employment, favouring permanent employment for prime age males and temporary jobs for other employees such as women, lower-skilled workers and immigrants (see e.g. Kugler, Jimeno & Hernanz, 2005; Kahn, 2007). This finding is corroborated by Égert and Gal (2018).

The literature has also investigated the effects of EPL on productivity growth. In theory, EPL can support productivity growth by facilitating investments in firm-specific skills but harm it by deterring radical innovations and reducing job effort. Most empirical studies have found that strict EPL hampers productivity growth. Using sector-level data from a set of OECD countries and a difference-in-difference framework, Bassanini et al. (2009) report that TFP growth is lower in industries where employment protection is binding, where their design suggests a causal effect. As a possible channel between EPL and productivity growth, Gautier, Bartelsman & de Wind (2016) propose that higher employment protection discourages taking risky but on average higher rewarding investments. Furthermore, using harmonized firm-level data for 21 OECD countries, Andrews and Cingano (2014) find that stricter employment protection legislation makes the reallocation of resources across heterogeneous firms less efficiency enhancing.

The literature has also studied dimensions of collective bargaining. Several studies have investigated the impact of union membership on individual earnings. In general, older studied typically found significant premiums of union membership sometimes in the two-digit range. These studies, however, could not account for selection effects. On the basis of a regression discontinuity design, DiNardo and Lee (2004) find no wage effect of unionised firms in the United States. On the other hand, Breda (2015) looks at the wage difference between unionised and unionised firms in France and finds that workers in unionised firms enjoy a 2-3% wage premium.

At the macroeconomic level, wage growth that outpaces productivity developments can lead to competitiveness-losses and translate into higher unemployment, unless mechanisms exist to internalise such costs. A well-known hypothesis is that such internalising mechanisms are strongest in case of decentralised bargaining – where union members are directly exposed to the consequences of excessively high wage claims – and fully centralised schemes – where the bargaining process is more likely to take into account macroeconomic externalities due to political economy considerations (Calmfors & Driffil, 1998). Empirically, the impact of the degree of wage bargaining centralisation on employment is not straightforward. On the one hand, studies have found that firm-level bargaining supports employment growth. For instance, Dustmann, Fitzenberger, Schönberg and Spitz-Oener (2014) show that possibilities to opt out of sector-level agreements in Germany have facilitated employment growth.

Furthermore, the widespread use of extensions of sector agreements in Portugal has been found to negatively affect employment (Martins, 2014). In addition, Marotzke, Anderton, Bairrao, Berson and Tóth (2016) show that collective pay agreements reduce the probability of downward wage adjustment in Europe, thereby also confirming previous studies on wage rigidities in Europe. Anderton, Hantzsche, Savšek and Tóth (2017) show that such wage rigidities seem to be particularly binding in downturns. On the other hand, macroeconomic outcomes seem to differ substantially within the group of countries where sector-level wage bargaining is dominant, probably because of large differences in the rules of the game (Blanchard et al., 2014; IMF, 2016).

The analysis of Hijzen et al. (2018) points to the potential beneficial effects of centralised or co-ordinated collective bargaining systems for labour market resilience. Another feature of collective bargaining is the duration of contracts in the context of large economic shocks. Especially when contracts are bargained just before a shock, and do not clauses to deviate in case of hardship, they can endanger employment. This was also relevant in the recent crisis, where long contracts were found to exacerbate employment losses in Spain (Díez-Catalán & Villanueva, 2015).

1.3.2   Cross-country and cross-reform studies

Using country-level data, Bassanini and Duval (2006) provide a comprehensive account of the impact of a series of structural policies and institutions (and interactions) on employment outcomes (similar results are presented in Bassanini & Duval, 2009). They find that high and long-lasting unemployment benefits, high marginal tax wedges and high product market regulation (all captured by OECD indicators) increase structural unemployment.

On the other hand, highly centralized or coordinated wage bargaining is associated with lower unemployment. Active labour market policies (ALMPs) do not significantly impact on unemployment, at least for the overall indicator, nor does employment protection or union density. These authors also investigate the impact of institutions on employment. An important aggregate finding is that high unemployment benefits and high tax wedges decrease employment. Similarly, they test whether institutions interact with shocks. Relatively robust findings are that high unemployment benefits amplify the adverse unemployment effect of a shock, while on the other hand high corporatism decreases this impact.

As mentioned above, they also find some evidence of interaction effects. For instance, ALMPs can reduce the negative employment effect of unemployment benefits. Regarding the impacts of a number of reform measures by aggregating over the effects on physical capital, employment and productivity through a production function, Égert and Gal (2018) show that product market deregulation has the largest overall single policy impact five years after the reforms. At the same time, a package of various labour market policies under study can have a considerably larger impact.

The empirical literature also studied the interaction between shocks and institutions. In a panel of 20 OECD countries, Blanchard and Wolfers (2000) find that this interaction is crucial to explain the rise in unemployment since the 1960s as well as the increased heterogeneity between countries. This notion follows also from the recent paper by Hantzsche, Savšek and Weber (2018), which investigates propagation of financial shocks in a country-sector panel of euro area countries. Authors report that responses to a financial shock are asymmetric depending on the sign of the shock, different in magnitude depending on the sectoral composition, and sensitive to labour market institutions, such as EPL and union density.

Bouis, Causa, Demmou, Duval and Zdzienicka (2012) present a systematic empirical assessment of the short-run impact of various structural reforms. They look at the effects of reform shocks on variables such as employment, unemployment, participation and GDP growth over a 1 to 5 year horizon. They find no evidence of large short-run employment and growth costs of reforms. An exception is the reduction of employment protection of temporary workers; the authors find that in the short run this is associated with lower employment, participation and growth. At the same time, various reforms can yield significant short-run benefits. This is particularly true for unemployment benefit reform, which yields positive employment effects relatively quickly. By some indicators, there can be benefits in year 1-2 already, albeit small. These findings are in contrast with Cacciatore and Fiori (2016), who use panel VAR estimation for 20 OECD countries over the period 1981-2005 and provide evidence that labour and product markets deregulation involves potential short-run costs materialized by higher unemployment and lower output.

Bouis et al. (2012) furthermore find that the state of the economy matters, especially for the impact of unemployment benefit reform and employment protection of regular workers. While in the baseline scenario there are short-run employment gains (unemployment benefits) or at least no losses (employment protection), in a depressed economy reforms are associated with employment losses, albeit smaller than the potential gains in good times.

This underscores the potential role of other macroeconomic policies. For instance, the analysis of Bordon et al. (2018) points out that some structural reforms are best initiated in conjunction with supportive fiscal or monetary policy. This is also what Hijzen et al. (2018) find in a study of labour market resilience in the recent global financial crisis. Following the theoretical work of Blanchard and Giavazzi (2003), who demonstrated a degree of substitutability between product and labour market regulations in a general equilibrium setting, several studies have also empirically investigated this relationship. Estevão (2005), for example, finds that in case product market regulation is low, the impact of lower labour costs on GDP is larger. It seems that ALMPs seem to complement some other labour market institutions in facilitating employment (Estevão, 2007). Berger and Danninger (2006) also report sizable interaction effects from both regulations. Positive interactions are also reported in a case study by Annett (2007).

Furthermore, Nicoletti and Scarpetta (2005), Bassanini and Duval (2006, 2009) and Bassanini et al. (2009) report that significant gains can be obtained by deregulating product and labour markets, suggesting complementarity between those types of regulations. However, not all empirical findings support this conclusion. For instance, Bouis et al. (2012) report that product market reforms might reduce employment and increase unemployment when employment protection is weak, suggesting some degree of substitutability between product and labour market regulations. This relationship is still debated in the theoretical (structural model based) literature, which is presented in the next section.

1.4 An overview of results from structural model based exercises

1.4.1 Overall findings

Models typically find large long-run gains from labour and product market reforms to output, consumption, investment and employment. For instance, based on simulations with the European Commission's QUEST model in't Veld et al. (2018) find considerable long-run gains from moving structural policies in Italy, France, Spain and Portugal in line with the top performers in the EU. This also goes for simulations of Jacquinot et al. (2018) and Pierluigi and Vetlov (2017) with the ESCB's EAGLE model.

However, there is more disagreement regarding the short-term dynamics. For example, Blanchard and Giavazzi (2003) point out that increasing competition in the labour and in the product markets induces disappearance or decline of incumbent firms, leading to a temporary decrease in employment and real wages. Kilponen and Ripatti (2006) underline that factors causing short-run costs are the wealth effects induced by a temporary reduction in profits triggered by the increase in competition, as well as the temporary increase in the real interest rate caused by the slowdown of expected domestic inflation induced by higher competition. Cacciatore and Fiori (2016) claim that product market deregulation increases unemployment due to a time-consuming reallocation of workers between shrinking and expanding firms. Moreover, product market deregulation requires new investments as new firms are entering the market and these needs to be financed by reducing consumption.

On the other hand, labour market deregulation affects the hiring and firing incentives of existing firms, regardless of the number of firms in the market. While hiring new staff takes more time, immediate layoff of workers operated by incumbent firms temporarily raises unemployment and reduces GDP. For example, Jacquinot et al. (2018) show mutually reinforcing impacts from a combination of labour and product market reforms at the effective lower bound. However, Cacciatore et al. (2016) confirm complementarity between these regulations only in the short run, while substitutability between regulations seems to be present in the longer run. Therefore, this relationship seems to still be unclear from the theoretical perspective.

Some theoretical papers put the above results into perspective by showing that the short-run effects of structural reforms are uncertain and depend on the type of reform adopted (Cacciatore & Fiori, 2016; Cacciatore et al., 2016) or even provide evidence of benefits in terms of GDP from reforms already in the short run.

On the other hand, proper implementation seems to eliminate or significantly reduce possible short-term negative effects in some macroeconomic aggregates. As a matter of fact, Jacquinot et al. (2018) show that even though structural reforms may entail transitory output costs, those can be reduced or eliminated by an appropriate sequencing, cross-country coordination and supportive fiscal policy or monetary policy.

Cross-country spillovers induced by reforms to the rest of the world have also been investigated. These are typically found positive but small or insignificant. For example, in't Veld et al. (2018) show that compared to the 'acting alone' scenario, jointly implementing reforms yield only minor additional benefits in terms of GDP. However, some studies reach different conclusions. For instance, Gomes, Jacquinot, Mohr and Pisani (2013) suggest that reform coordination across countries turns out to be very important, as it would work to the direction of eliminating macroeconomic heterogeneity across countries. This argument also follows from the analysis by Pierluigi & Vetlov (2018), which shows that spillovers from a euro-area wide implementation of a reform package can be very substantial. Due to their general equilibrium setup, DSGE models are particularly well suited to examine the interaction of different policy areas. The short-to-medium term impacts of structural reforms do not only depend on the type and size of the reform shock, but also on the response of fiscal and monetary policy which in normal times react endogenously to the shocks hitting the economy. Thus, constraints on demand side policies can also influence the impact of structural policies.

DSGE frameworks have been used recently to examine the interaction of structural reforms and monetary policy, with the latter being constrained to react to the short-term effects of reforms. The constraint can come from a binding effective lower bound (ELB) on nominal interest rates or membership in a monetary union, where common monetary policy reacts to country-level developments only to a limited extent. While the long-run effects of reforms typically remain unaffected, constrained monetary policy can have a bearing on their short-term impacts. For example, if monetary policy is not able to react to short-run deflationary effects of some reforms, the real interest rate will increase, which dampens the response of consumption and investment. In most models the net short-run impact of reform shocks in the context of constrained monetary policy depends on the relative strength of the intertemporal substitution and permanent income or wealth effects.

1.4.2   Reforms under constrained monetary policy

DSGE frameworks have been used recently to examine the interaction of structural reforms and monetary policy, with the latter being constrained to react to the short-term effects of reforms. The constraint can come from a binding ELB or membership in a monetary union, where common monetary policy does react to country-level developments only to a limited extent. While the long run effects of reforms typically remain unaffected, constrained monetary policy can have a bearing on their short-term impacts. For example, if monetary policy is not able to react to the possible short-run deflationary effects of some reforms, the real interest rate increases, which dampens the response of consumption and investment. In most models the net short run impact of reform shocks in the context of constrained monetary policy depends on the relative strength of the intertemporal substitution- and permanent income or wealth effects.

The current debate about the short-term impact of reforms against the backdrop of constrained monetary policy started with Fernández-Villaverde, Guerrón-Quintana & Rubio-Ramírez

(2011). In a two-period new Keynesian model the authors implement structural reforms as shocks to future productivity. A fully anticipated increase in future productivity generates wealth effects that increase present consumption. In their set-up monetary policy would normally increase interest rates in response to higher present consumption, which is not the case under the zero lower bound constraint. Overall, they find that anticipated future increases in productivity boost demand in the present and thus can to some extent substitute demand side policies when the latter are constrained.

Eggertson et al. (2014) introduce structural reforms in a two-country monetary union as an immediate and permanent reduction in product (non-traded sector) and labour market mark-ups, with monetary policy constrained by a lower bound on nominal interest rates. Since monetary policy cannot decrease nominal rates in response to the short-run deflationary impact of reforms, the real interest rate increases which more than counteracts positive permanent income effects and the depreciation of the terms of trade, thus reforms become contractionary over the short run. The short-term negative effect on output is increasing with the magnitude of the reforms and becomes particularly large when reforms are not fully credible.

On the other hand, the credible announcement of structural reforms for some future period when the ELB is no longer binding can make the permanent income effects of reforms dominate over the short run. In Fernández-Villaverde's (2014) discussion of the results of Eggertson et al. (2014) - which is mostly based on the two period model introduced in Fernández-Villaverde et al. (2011) - three key points stand out. First, the timing of the reforms is important. Product and labour market reforms are likely to be implemented with some lag, possibly beyond the period over which the ELB is binding. In this case – if they are perceived as credible – reforms implemented in the future can well be expansionary even in the short run. Second, the model of Eggertson et al. (2014) does not include investment, thus a powerful forward looking transmission channel which brings forward the long run effects of reforms is lacking.

Third, solvency constraints in euro area periphery countries can matter a lot, but are unaccounted for in Eggertson et al. (2014). Expected long run gains in output due to structural reforms can translate to less doubt about debt sustainability thus lower risk premia and increased confidence, which can boost short run growth.

The short run effects of structural reforms in a binding ZLB environment has also been examined with the European Commission's QUEST model (Vogel, 2017). It is found that compared to normal times a binding ELB constraint increases the short-term contractionary effect of reforms due to a decline in real interest rate sensitive expenditure. However, the negative short run effects are an order of magnitude smaller than in Eggertson et al. (2014) due to a larger number of transmission channels, including investments. Short-term effects also depend on the specific reform measures. QUEST results, furthermore, do not yield support to the idea that delaying structural reforms would improve the policy trade-off.

The response of investments to credibly announced structural reforms is also key in Gerali, Notarpietro & Pisani (2015) who examine the effects of a service sector reform, captured as a reduction in the non-traded sector mark-up, implemented in a small economy within a monetary union. They find that even in the context of the ELB a service sector reform increases GDP over the short-to-medium run and this effect critically hinges upon the response of investments. The latter react strongly to the permanent income effects induced by increased competition in the service sector, more than offsetting the contractionary impact of rising real interest rates stemming from monetary policy being unable to accommodate the deflationary impact of reforms under to the ELB. Conversely, in case of no investment response – e.g. due to prohibitively strict financing constraints – the deflationary impact of reforms dominates.

Gomes' (2014) findings are similar to Gerali et al. (2015), however, the author also delves into issues related to reform coordination and implementation. Findings of the paper suggest that structural reforms can help to alleviate the impact of the recession that drove the common monetary policy of into the ELB, but reform coordination across member countries is necessary to reduce the time spent at the ELB. The short to medium run impact of reforms depends on whether these were introduced gradually or not and if they are perceived as temporary or permanent.

The model of Andres, Arce and Thomas (2014) features financial frictions in the form collateral constraints and long-term debt, which introduces an additional layer of interactions in comparison to the previous papers. They find that structural reforms captured as wage and price mark-up reductions can mitigate the short-run output and employment losses in a deleveraging scenario. In the case of the product market reform, the usual channels are at work: stronger competition and the ensuing long-run gains in consumption and output lead households and firms to increase their investment in the short run. On top of this, short-run gains are reinforced by borrowers anticipating higher collateral values from and less or no longer binding collateral constraints. Thus, the reform brings forward the end of the deleveraging process and hence of the recession through the financial accelerator mechanism. The latter effect is missing in the case of labour market reforms, where short-run effects are sensitive to the response of trade flows and debt maturity.

Instead of simulating the impact of permanent price and wage mark-up shocks, Cacciatore et al. (2016) explicitly model underlying structural frictions (such as endogenous producer entry costs and search and matching frictions) allowing for more realistic structural reform shocks. The authors look at the impact of cutting barriers to entry, employment protection and unemployment benefit reforms as well as active labour market policies. While reforms have a positive impact on GDP and consumption over the long run, they can be contractionary over the shorter horizons due to the time it takes until benefits through increased firm entry and hiring materialize whereas reform driven downsizing of incumbent firms and layoffs are immediate. Importantly, the type of reforms they introduce do not have significant deflationary effects, thus a binding ELB constraint doesn't make their impact more contractionary.

1.5   The Political Economy of Reforms

Political economy considerations are important to understand what determines and hinders structural reforms. On the one hand, the uncertainty associated with the unequal distribution of gains and losses of reforms turns out to be the most significant hindrance of efficiency-enhancing reforms. On the other hand, there is evidence suggesting that policymakers should never waste a good crisis, especially because it tends to provide an accommodating environment for progress. Also, compensating the losers of reforms is important, but rather through bundling reforms than by means of direct monetary transfers.

One of the most pronounced obstacles for (structural) reforms is the uncertainty about the distribution of gains and losses of reforms. As a consequence, people tend to favour the status quo, implying that they are particularly wary of being worse off relative to the situation as is (Fernandez & Rodrik, 1991). An interesting example thereof is workers opposing privatization, even though they know most will benefit in the end, because they do not know whether their individual skills will be demanded after the reform (de Haan et al., 2006). As such, uncertainty about the distributional pattern of reforms ex ante may hamper their occurrence, even while social welfare is expected to increase ex post.

Additionally, an unequal distribution of the costs of reforms amongst a polarized political landscape, make that structural change is less likely to happen. The argument is that socioeconomic groups, unevenly affected by the reform, have an incentive to delay the reform, in particular because by doing so they may shift a disproportionate share of its burden to other interest groups. So they effectively engage in a 'war of attrition', whereby they make a trade-off between the costs of delaying the reform against the gain from averting its potential costs. So, even though all parties may agree that reform is required, the disagreement about how the burden is to be shared may cause serious delays (Alesina & Drazen, 1991). Given these large obstacles to reforms, it is perhaps not surprising that several authors have found that crises make reforms more likely (Pitlik & Wirth, 2003; Duval and Elmeskov, 2005; Agnello, Castro, Jalles & Sousa, 2015; Dias Da Silva, Givone & Sondermann, 2017).

In times of economic distress, policymakers have to fight tooth to nail in order to keep the economy afloat. The economic situation as such may, in that regard, actually be helpful to bring about structural changes to support the recovery. That is to say, it will strengthen the insight of politicians that something needs to be done. Furthermore, crises tend to diminish the strength of interest groups which were formerly able to hinder the progression of reforms. And, finally, 'wars of attrition' may be shortened considerably, in particular because dire economic circumstances alter the balance of pay-offs of the game, i.e. in general the costs of delaying reforms rise significantly (Pitlik & Wirth, 2003).

A final insight from the political-economy literature is that compensating the losers of reform is important, but policymakers should rather do this by bundling reforms instead of through direct monetary transfers (Haggard & Webb, 1994). In a world where there might be

considerable uncertainty about the distributional consequences of reform, even direct compensation schemes may prove to be ineffective to incentivize economic agents to favour structural reforms. This is the case because direct compensation schemes are arguably time-inconsistent, in particular because the ex post majority in favour of the reforms may have an incentive to renege on the compensation arrangement agreed upon ex ante (Fernandez & Rodrik, 1991). In fact, the identification of losers and winners ex ante remain an issue in practice. Bundling reforms such that potential losers from one reform would benefit from the prospective gains of other reform could overcome at least partly this problem. Furthermore, supportive fiscal policies may be used to soften possible costs, such as was done in Germany at the time of the Hartz reforms (Röhe & Stähler, 2018).

1.6   Conclusion

The impacts of structural reforms have been studied heavily in recent years and the literature review provides only a snap shot of the on-going directions and outstanding issues. Our tentative conclusions are the following.

First, with the development of new databases and modelling approaches, researchers and policy makers have become increasingly more confident about impacts of structural measures. However, in empirical work it is still hard to identify and disentangle the causal effects of reform measures due to selection bias and a wide range of confounding factors. Researchers have to make critical assumptions about the timing, channels or use imperfect indicators to eliminate the impacts of reforms.

On the other hand, results from structural model based approaches depend crucially on modelling choices concerning inter alia the nature of structural rigidities, calibration of parameters and policy interactions. Yet, in both empirical and theoretical work there is broad consensus on long-run aggregate gains in terms of output and/or employment in response to most product market- and labour market reform measures.

Second, short-term impacts of reforms are potentially more difficult to measure in the first place, while reforms are made to affect the long-run steady state of the economy. Therefore, interpreting their short-term impacts should be made with more caution. The literature review shows that proper implementation and timing play a key role in determining successfulness of reforms. Supportive demand side policies, where available, can to a large extent dampen possible short-term costs. In this context, it is rather unfortunate that reforms are typically introduced in crisis periods – when demand side policies can become constrained, while there are not many reforms implemented in good times as our political economy reforms chapter shows. Finally, the question on how to build institutions that will help bring about a sense of reform urgency also in normal times is most probably the most difficult to answer. The literature reviewed here suggests that the bundling of reforms and accommodating demand-side policies may facilitate the adoption of reforms. Apart from this, we see a further need for academia and policy institutions to investigate the supply side issues.

2 LABOUR MARKET ADJUSTMENTS TO FINANCING CONDITIONS UNDER SECTORAL RIGIDITIES IN THE EURO AREA[5]

2.1 Introduction

Following the financial crisis and the sovereign debt crisis, the unemployment rate reached an all-time high in the euro area since the creation of the common currency and for some member states for several decades. Despite the strong overall employment adjustment, there has been significant heterogeneity and renewed divergence across the euro area after several years of convergence to more similar unemployment rates in the run-up to the crisis. Recent advances in the literature suggest that the financial nature of the shock explains a stronger labour market adjustment compared to labour market responses during recessions that are not related to financial sector shocks. Boeri, Garibaldi & Moen (2013) report that recessions initiated by a financial crisis are characterised by a larger response of unemployment and hours worked compared to non-financial recessions.[6] Boeri and Jimeno (2016) argue that financial shocks seem to be more closely associated with cross-country changes in unemployment and GDP than demand shocks. Thus, there appears to be a prominent role for financial frictions and financial shocks in affecting the labour market adjustment beyond what is implied by "ordinary" output slack considerations.

Combining labour search-and-matching and some form of financial friction, a recent body of literature has started to investigate the relevance of financial factors for labour market dynamics, mostly in the context of New-Keynesian models.[7] While specific modelling approaches vary, the core mechanism is one in which firms rely on credit for the production process and need to post vacancies to fill jobs in a search-and-match environment. As financing conditions tighten, firms cut down on investment, which causes output to fall. The lower level of demand implies lower hiring by firms which translates into persistently lower employment levels, amplifying the financing shock's impact on output (Mumtaz & Zanetti, 2016). The resulting higher unemployment exerts downward pressure on the wage rate.

Many models make no distinction between the extensive (employment) and the intensive (hours per worker) margin of adjustment. However, in principle, firms can adjust by scaling down the production through lower levels of employment, reducing the working hours per employee or maintaining profitability by reducing the costs from the wage bill for a given level

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[5] This chapter closely follows Hantzsche, Savšek & Weber (2018).

[6] Based on a sample of sectoral data for OECD countries Boeri et al. (2013) for example show that the shift of the Okun's law intercept during the financial crisis is about half of that occurring during normal recessions. Hence, output growth required to avoid unemployment from rising needs to be more than one and a half as strong in following financial crisis compared to non-financial recessions.

[7] See for instance Christiano, Trabandt & Walentin (2011), Mumtaz & Zanetti (2016), Zanetti (2015), Ben-Mohamed & Salès (2015).

of employment. Boeri and Jimeno (2015, 2016) assign a central role to labour market institutions and employment policies in affecting this decision in the post-crisis period in Europe by determining the degree of labour hoarding in response to shocks.[8] It seems that for liquidy-constrained firms reducing wages is similar to actually borrowing from workers (Boeri & Jimeno, 2016). It seems that in those countries, where strong downward nominal wage rigidity is present, employment adjustments are stronger on impact. Ohanian and Raffo (2012) argue that in Europe, hours per worker are quantitatively important as a margin of labour market adjustment, possibly because labour market frictions at the extensive margin are higher in Europe than in the US. However, while confirming that labour market frictions are more pronounced in Europe than the in the US, a paper by van Rens (2011) does not confirm the importance of hours worked as a significant adjustment mechanism in Europe. Thus, the relative strength of the respective margin of adjustment is likely to be conditioned by the combination of regulatory labour market framework, the nature of the shock and the conditions firms face in a given sector.

Earlier studies focusing on the labour market have already been pointing towards the role of specific institutions in shaping the overall adjustment of the labour market and shifting the adjustment towards specific margins.[9] For instance, Blanchard and Wolfers (2000) investigate the interaction between shocks and institutions in a panel of 20 OECD countries. They find that this interaction is crucial to explain the rise in unemployment since the 1960s as well as the increased heterogeneity between countries, which cannot be solely attributed to shocks. Higher replacement rates, longer duration of unemployment benefits, higher employment protection, a higher tax wedge, higher union contract coverage and density lead to a larger effect of shocks on unemployment, whereas active labour market policies and coordination lead to a smaller effect. Similarly, Bassanini and Duval (2006) test how institutions interact with "unobserved" shocks and "observed" shocks (TFP, terms of trade, labour demand and interest rate shocks) and find evidence that high unemployment benefits amplify the adverse unemployment effect of shocks, while high corporatism decreases this impact. Bowdler and Nunziata (2007) asses the interaction of labour market structures and shocks in a panel of 20 countries. Their estimations suggest that the effect on inflation of movements in unemployment, import prices, tax rates and productivity is dampened, both on impact and dynamically, in cases of high labour market coordination. High unionisation of the workforce appears to amplify the response of inflation to its reduced-form determinants. The authors attribute these findings to the behaviour of wages following movements in demand- and supply-side conditions.

Another area related to our investigation studies the role of institutions for business cycle fluctuations. Georgiadis (2014), using a panel VAR model of 20 industrial countries from 1995-

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[8] Boeri and Jimeno note that in the post-crisis period "in Germany adjustment along the intensive margin reduced the response of unemployment to the output fall, in Spain it is the decline in labour hoarding […] together with a slight increase in participation and an initial increase in hours worked per employee that explains the rise in the unemployment rate." (Boeri & Jimeno, 2015, p.13)

[9] For some of the most recent examples see for instance IMF (2016).

2009, finds that up to 70% (50%) of the cross-country asymmetries in the responses of output (prices) to a monetary policy shock can be replicated by accounting for cross-country differences in financial structure, labour market rigidities and industry mix. Gnocchi, Lagerborg and Pappa (2016) quantify the importance of a number of institutional characteristics for business cycle fluctuations. From their paper, it follows that flexible labour market institutions are generally associated with lower business cycle volatility. They find that reforms of employment protection are associated with increased volatility of employment. Abbritti and Weber (2010) also empirically assess the effect of labour market institutions on business cycle fluctuations in an interacted panel VAR set-up for a sample of OECD countries. Their paper finds a large and significant effect of stringent employment protection and higher union density in reducing unemployment volatility and increasing inflation volatility.

Drawing on the various strands of the literature, our study tries to disentangle the importance of institutional rigidities for the propagation of financial shocks at the country-industry level. Whereas several of the above reviewed empirical studies use the cross-sectional dimension to study interactions between institutional rigidities and employment outcomes, we are more interested in the dynamic effects. In particular, we are interested in the propagation of financial shocks across all three margins of labour market adjustment and possible asymmetries, which might arise due to the sign of the shock and/or strictness of labour market regulations or/and sectoral compositions. We focus in particular on two institutions characterising labour markets in the euro area: employment protection legislation (EPL) and union density.

Regarding the role of EPL for the propagation of financial shocks, the hypotheses are related to the costs they induce for firms' adjustment decisions. Stringent EPL implies higher cost of firing and hiring (Blanchard et al., 2014). Facing higher costs, we expect firms to shift the adjustment burden from employment to the other margins of adjustment that are relatively less costly. Regarding the role union density, theoretical predictions are less clear cut. In line with theoretical discussion in Freeman and Medoff (1984), the monopoly power of unions enables them to raise wages above the competitive level which implies a loss of economic efficiency. On the other hand, unions can have an overview of the general state of the economy and may internalize wage pressures to preserve employment levels, especially in times of slack. The implications of union density are therefore an empirical question.

We use sector-level data for multiple reasons: First, the transmission of financial shocks in a country-sector panel has not been investigated for the euro area. Second, much of the regulation is sector-specific and cannot be fully reflected in more aggregate indicators. Third, the sectoral dataset provides us with an opportunity to better control for public sector dynamics and employment composition effects. Using the local projections method, we estimate the responses of public, construction, services and manufacturing sectors to changing financial conditions for a panel of 15 euro area countries. We find contractionary financing shocks to depress all three labour market indicators. While we find a strong and significant response of employment and real wages, adjustment in hours worked appears to be somewhat less important.

Furthermore, responses are asymmetric depending on the sign of the shock. Our analysis shows that tighter financing conditions tend to go along primarily with labour market adjustment through employment and real wages, while easing financial conditions imply more limited adjustment of employment and real wages and more pronounced increases in hours worked per employee. A sectoral analysis reveals that the adjustment in employment is strongest in the construction sector and weakest in the services sector. In terms of real wage adjustment, the results are the opposite. We find immediate and more persistent adjustments in real wages in the services sector while the real wage adjustment in manufacturing and construction sectors is materialising only with a delay, after employment has declined. Hours worked is used as an adjustment margin mainly in manufacturing and construction. The different propagation across the three margins can partly be explained by the cross-sectoral heterogeneity of labour market institutions. Sectors with more flexible employment institutions, as for example construction, are characterised by smaller initial wage adjustments and more significant employment adjustments. On the other hand, sectors with strict employment protection, like services, adjust more along the wage margin. Finally, rather than limiting the response of the three margins of adjustment, that make up the combined wage bill, labour market institutions seem to mainly affect the relative strength of adjustment margins in response to a given shock.

The remainder of the chapter is organised as follows. Section 2.2 describes the empirical strategy. Section 2.3 presents the results. Finally, Section 2.4 concludes and draws policy implications.

2.2   Empirical Strategy

To estimate the dynamic response of labour market variables to financing shocks, we employ the local projections approach introduced by Jordà (2005) and refined by Auerbach and Gorodnichenko (2013). The local projections method provides several advantages over standard VAR specifications. Specifically, it is less prone to misspecification, because each period is estimated separately and it can capture non-linearities in the impulse responses. Additionally, a panel set-up with interaction effects between regressors can easily be implemented. At the same time, the method suffers from some disadvantages relative to a VAR specification. The further the horizon of the impulse response, the more likely it is that confidence intervals widen. This is a result of the requirement that in order to estimate the h-th period-ahead response, at least h lags are required for the data.

Furthermore, local projection methods do not account for shocks that materialise between t and t + h, which may bias estimation results, if shocks are one-directional following t and serially correlated. In the context of our analysis, the advantages of capturing possible non-linearities likely outweigh possible disadvantages. The latter are reduced by a sufficiently large time dimension of our sample and limited autocorrelation of our independent variables of interest.

2.2.1 Estimation approach

We estimate the following equation for quarterly data, separately for forecast horizons

$$h = 0, \dots, 10,:$$

$$\log y_{i,j,t+h} - \log y_{i,j,t-1}$$

$$= \sum_{l=1}^{4} \alpha_{l,h} \Delta \log y_{i,j,t-l} + \beta_h Shock_{i,t} + \gamma_h C_{i,j,t} + \vartheta_h t_{i,j} + \mu_{i,j,h} + \mu_{t,h} + u_{i,j,t} \tag{1}$$

where $y_{i,j,t}$ is one of the relevant dependent variables reflecting the respective margin of adjustment (employment, hours worked per employee or real wages per hour) in sector j of country i. $Shock_{i,t}$ is our measure of financing conditions, which is common across sectors within a country. $C_{i,j,t}$ is a vector of macroeconomic control variables. We include log changes in gross value added (GVA) in the relevant country-sector and country-level movements in the GVA deflator to capture business cycle dynamics. Sectors may spuriously appear flexible if they are characterised by a disproportionally large share of non-permanent employment. We, therefore, control for the composition of the employed labour force by adding the sector-specific share of temporary and part-time workers. $\mu_{i,j,h}$ and $t_{i,j}$ are country-sector fixed effects and country-sector-specific time trends. $\mu_{t,h}$ are time-fixed effects and $u_{i,j,t}$ is an idiosyncratic error term.

For the baseline regressions, the sequence of β_h- estimates are our parameters of interest, reflecting the dynamic response of the dependent variables to changes in financing conditions. Pooling the data and estimating equation (1) yields the average response across countries and sectors. 90% confidence intervals are calculated using Driscoll-Kray standard errors that are robust to heteroscedasticity, autocorrelation, and cross-sectional dependence of the error term. Possible issues related to endogeneity should be mitigated by the use of sectoral data as dependent variable, because sector-specific developments in labour markets should have a more limited effect on country-wide financing shocks.

To understand the possible heterogeneity in the responses of employment, hours worked and real wages to financing socks, we extend the baseline estimation along three dimensions to distinguish: (i) tightening and easing shocks, (ii) sectoral differences, and (iii) responses under different labour market institutions. For this purpose, we augment the regression equation as follows:

$$\log y_{i,j,t+h} - \log y_{i,j,t-1}$$

$$= \sum_{l=1}^{4} \alpha_{l,h} \Delta \log y_{i,j,t-l} + \beta_h Shock_{i,t} + B_h I_{i,j,t} \times Shock_{i,t} \tag{2}$$

$$+ \gamma_h C_{i,j,t} + \delta_h I_{i,j,t} + \vartheta_h t_{i,j} + \mu_{i,j,h} + \mu_{t,h} + u_{i,j,t}$$

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Thus, we include an interaction term $I_{i,j,t} \times Shock_{i,t}$ that reflects different aspects depending on the dimension of heterogeneity we investigate. More specifically, for case (i) $I_{i,j,t}$ is an indicator variable that takes the value of one if the financing shock variable decreases. In this case, β_h yields the estimate for tightening (positive) changes in the financial conditions measure at forecast horizon h, while $-(\beta_h + B_h)$, the joint significance of which we test separately, is the estimate for easing (negative) shocks.

To obtain sector-specific estimates, for case (ii), we replace $B_h I_{i,j,t}$ with $\sum_{i=1}^{3} B_{i,h} I_j$, a set of dummy variables that take the value of one for three of the four sectors and calculate $(\beta_h + B_{i,h})$ as the sector-specific response. The base case estimate (β_h) is the fourth sector. In specification (iii), in order to estimate the response conditional on the degree of labour market rigidities, we include as indicator $I_{i,j,t}$ our sector-specific measures of labour market institutions. We then evaluate $\beta_h + B_h I_{i,j,t}$ for the 20th $(\beta_h + B_h I_{20th})$ and 80th percentile $(\beta_h + B_h I_{80th})$ of the sample distribution of the respective institutional measure. This yields an estimate of the response of low-rigidity relative to high-rigidity sectors.

2.2.2 Data

For our analysis, we construct a country-industry panel dataset for 15 euro area countries[10] and the four main sectors. In particular, we define sectors according to NACE Revision 2 codes C for manufacturing, F for construction, G to N for services and O to Q for the public sector. We use quarterly data for the period 1999Q1 to 2015Q4. Individual country coverage varies due to data availability and accession to the common currency area, which yields an unbalanced panel. Our dependent variables are constructed using ESA 2010 data from Eurostat. We use the sectoral number of persons employed as employment measure.

Furthermore, we divide total hours worked per sector by the sectoral number of persons employed to obtain a measure of hours worked per person. A measure of real wages per hour is constructed by dividing nominal wage data by the total hours worked and the country-wide consumer price index. Our control variables, sectoral gross value added and the GVA deflator, are also taken from the Eurostat ESA 2010 dataset. Data on temporary and part-time work is obtained from the European Labour Force Survey.

We focus on two dimensions of sectoral labour market institutions. The first measure is a sector-specific indicator of employment protection legislation (EPL). We construct it using the OECD indicator of EPL for permanent work.

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[10] Austria, Belgium, Cyprus, Spain, Finland, France, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Slovenia, Slovakia.

Complementing this data with the share of temporary employment in the respective sectors taken from Eurostat, we derive the sectoral EPL by pre-multiplying the EPL for permanent work with the share of permanent workers in the respective sector[11]:

$$EPL_{i,j,t} = \left(1 - \frac{E_{i,j,t}^{Temp}}{E_{i,j,t}^{Temp} + E_{i,j,t}^{Perm}}\right) EPL_{i,t}^{Perm} \tag{3}$$

This yields a measure of effective sectoral EPL for quarterly data. Implicitly, we set employment protection legislation to zero for temporary contracts. This is plausible given that at the data frequency we consider (quarterly), non-renewal of temporary contracts can be used to terminate an employment relation that is temporary. As a second measure of labour market institutions, we use sectoral union density estimates reported in the ICTWSS database (Visser, 2015). We aggregate sub-sectoral data to match NACE 2 definitions. In addition, we linearly interpolate our measures of labour market institutions to obtain quarterly series and impute last available values for remaining years. As a proxy for financing conditions, we use the quarterly change in the country-specific spread of the 10-year government bond yield above the German bund.

The response of an outcome variable can be interpreted as the response to a one-standard deviation (i.e. 56 basis point) increase in the government bond spread. Government bond yield spreads determine the cost of borrowing for the government as well as lending rates set by domestic banks. They therefore serve as a good approximation to financial conditions faced by private and public employers. In a robustness exercise, which we report in the Appendix, we also use a quantity measure to proxy for credit shocks. The measure is captured by the residual from a country-by-country regression of real loan growth on its lag and the current and past realization of GDP growth.[12] Loans data are taken from the ECB and reflect the total outstanding stock of loans to the domestic economy. Real GDP data come from the Eurostat ESA 2010 dataset.

Finally, we exclude observations from our sample if they fall into a period in which the respective country was part of an economic adjustment programme.[13] During such periods labour market adjustments are affected by considerations other than standard business cycle patterns. In the Appendix, we report results for the full sample and the credit shock.

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[11] See also IMF (2016) for a similar approach.

[12] We use this measure to strip credit growth from demand driven increases, which would also directly affect employment. Results using the difference in loan growth rates are quantitatively similar.

[13] We define programme periods as follows: Greece since 2010, Ireland 2011 to 2013, Portugal 2011 to 2014, Cyprus 2013 to 2016, and Spain 2012 to 2013.

2.2.3 Descriptive statistics

Figure 1 provides an overview of our data for annual growth rates of employment, hours worked per person[14] and real wages across the four sectors considered. Manufacturing and construction generally experience more volatility of employment and hours worked over time compared to the services and public sector (Figure 1Figure 1a, b and d, e relative to Figure 1Figure 1g, h, j and k). Furthermore, construction is characterised by strong cross-country variation as illustrated by the relatively large interquartile range. Characteristics of real wage series do not show a similarly robust difference across sectors (Figure 1c, f, i, l).

While construction is also the sector with the widest dispersion in real wages across time and countries, the public sector seems to exhibit a larger volatility in wages relative to services, in particular over time. The fall in real wages in the public sector after the financial crisis (Figure 1l) is likely a result of wage freezes in this sector in some euro area countries, for instance Cyprus, Greece, Italy and Portugal (see also Table B1 in the Appendix). This suggests that sectoral differences in the dynamics of employment, hours worked and wages are important. In some instances, a trade-off between employment, hours and real wage adjustment seems to exist. One example is Portugal where employment volatility is higher in manufacturing compared to services, whereas the volatility of wages is lower in manufacturing than in services.

Figure 1: Growth of employment, hours worked and wages by sector

a) Manufacturing b) Manufacturing c) Manufacturing

d) Construction e) Construction f) Construction

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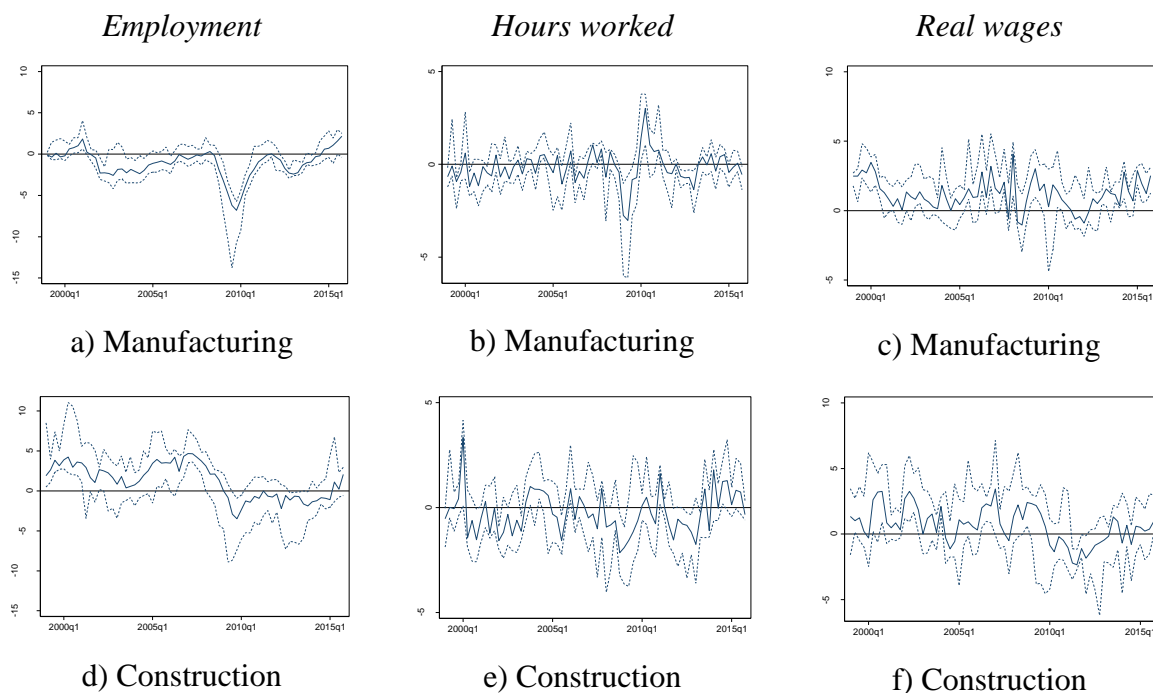
[14] In all figures of this chapter, we use ´hours worked´ expression uniformly for this channel.

Figure 1 continued: Growth of employment, hours worked and wages by sector

g) Services   h) Services   i) Services

j) Public sector   k) Public sector   l) Public sector
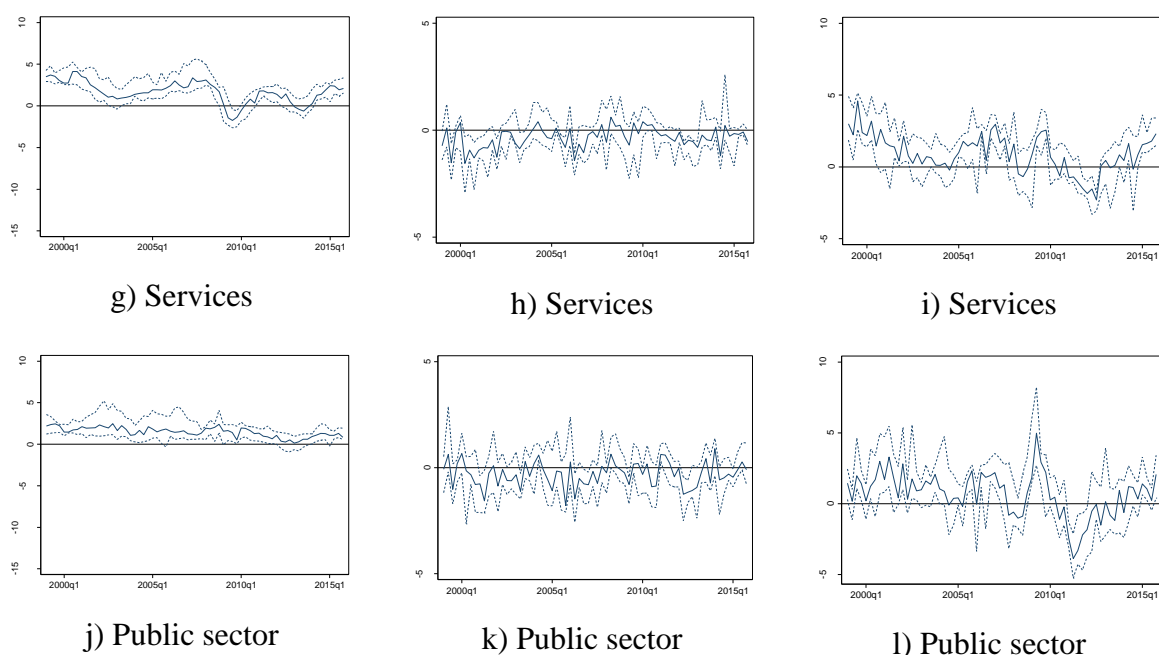
Note: Annual growth rates in percent. Excludes programme observations. Solid line depicts median across countries. Dashed lines depict interquartile range across countries.
Source: Hantzsche, Savšek and Weber (2018).

In Figure 2, we depict the evolution of our measure of financial conditions, as reflected by the quarterly change in the 10-year government bond yield spread for our estimation sample excluding the programme period. While before the global financial crisis of 2008, the variation of spreads was limited, the cross-country variation and dispersion increased substantially during the crisis period when a number of countries experienced quarterly changes in yields of more than 1 percentage points relative to the German bund.

Figure 2: Quarterly change in government bond yield spreads
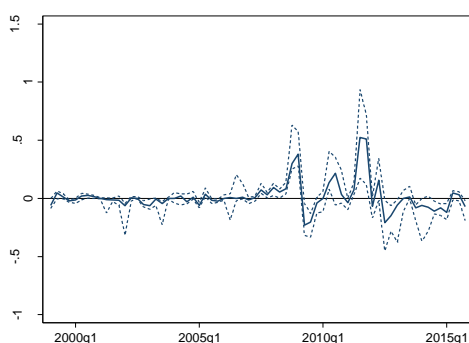
Note: Quarterly change in percentage points, sample excluding programme period. Solid line depicts median across countries. Dashed lines depict interquartile range across countries.
Source: Hantzsche, Savšek and Weber (2018).

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Our measure of effective EPL is characterised by strong temporal variation. The cross-country median fell from an indicator value of around 2.4 in 1999 to a lower level of protection with 2.1 in 2015 (Figure 3a). The 20th percentile of the overall sample distribution, which we use to calculate representative low rigidity responses in our empirical analysis, lies at 1.7. This corresponds for instance to the average degree of EPL in the Spanish manufacturing sector. The 80th percentile (high rigidity) is 2.6, corresponding to average level of the EPL in the Italian manufacturing sector or the Dutch public sector. Over time, the manufacturing and service sectors are characterised by higher effective EPL compared to construction and the public sector. This can partly be explained by the share of temporary workers (Figure 1b). According to the Eurostat classification, the public sector employs the highest share of temporary workers, in particular in Spain (23%), Finland (22%) and Portugal (19%). Services and manufacturing exhibit the highest share of permanent workers. Variation in union density takes place predominantly across sectors rather than time.[15] Overall, around 50% of workers in the public sector are organised in trade unions. The median share is lower in manufacturing (46%), construction (41%) and services (33%). The 20th percentile of the overall sample distribution of union density is 23% (labelled low rigidity in what follows) which is the average level of union density in the manufacturing sector of Spain. The 80th percentile is 60% (high rigidity), comparable for instance to averages in the Belgian construction sector.

Figure 3: Institutional indicators

a) EPL	b) Share of temporary workers	b) Union density
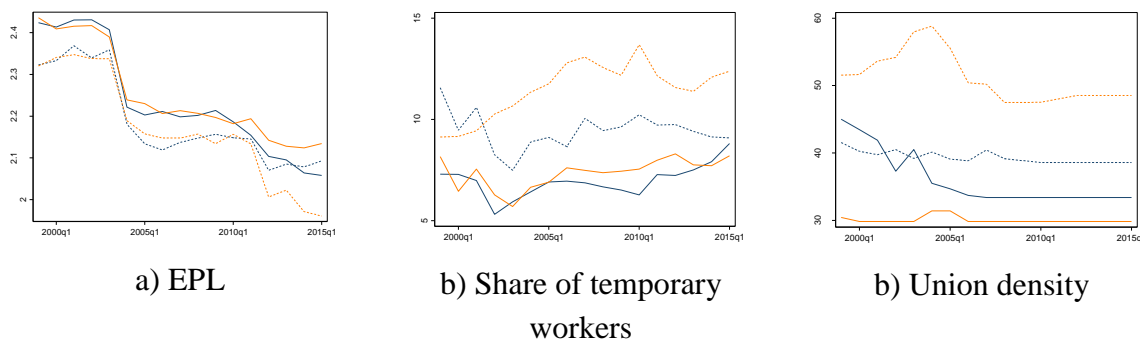
Note: Lines depict median across countries. Manufacturing solid blue (dark) line; construction dashed blue (dark) line; services solid orange (light) line; public sector dashed orange (light) line.
Source: Hantzsche, Savšek and Weber (2018).

2.3   Results

Using the described data, we first report baseline results for overall (pooled) responses to document the average adjustment across the labour margins and their relative strength. We then discuss the sectoral results to investigate the extent of heterogeneity across sectors.

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[15] To some extent this is a result of interpolations due to data availability, which limits the variability across time, leaves however the overall trend between the beginning and end of sample observations unchanged.

Finally, we analyse whether differences in labour market institutions can help explain the heterogeneity across country-sector responses.

2.3.1 Overall responses

The overall response of employment, hours worked and real wages to a one-standard deviation increase in the government bond spread is shown in Figure 4. Following a positive spread shock of 56 basis points, employment decreases gradually until it reaches a 1% lower level around 7 quarters ahead (Figure 4a). After that, employment starts converging back to its initial level. The strong employment response following a financial shock is in line with findings in Boeri et al. (2013). Hours worked exhibits a statistically significant decline around half a year after financial conditions tighten with convergence back to the initial equilibrium taking place around 8 quarters ahead (Figure 4b).

However, overall adjustment on this margin is very small on impact. On the other hand, real wages show a more significant decline (Figure 4c). Upon impact of the spreads shock, wages decline by around 0.3%, and up to another percentage point over the next two years and only converge to their initial levels more than 10 quarters ahead.

The results for all three variables show the expected sign and suggest that on average firms make use of all three labour margins to cope with higher financing costs. Coefficient estimates suggest that the reduction in the wage bill after 1 year following the shock is attained through roughly equal contributions from employment and real wages and to a lesser extent through a reduction in hours worked per employee.[16] These results are consistent with the model by Christiano et al. (2011), in which adjustment margins react in response to a net worth shock, which increases the risk premium.

In terms of the relative importance of adjustment margins, our finding of a more limited relevance of the intensive margin for the adjustment process confirms results in the study of van Rens (2011), who finds for several euro area countries that following recessions, hours worked per employee change very little and most of the adjustment takes place via employment.

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[16] In Table B2 in the Appendix, we provide a full set of regression results that correspond to baseline impulse responses shown in Figure 4 at forecast horizons $h = 0, 4, 8$. Table B2 illustrates that GVA growth is an important additional driver of employment and hours worked while the change in the GVA deflator significantly determines employment growth and real wages in the short run. Figure B1 in the Appendix provides results for the whole sample including programme period observations. Differences lie in the lack of convergence of employment back to the initial level as a result of a longer lasting rebalancing process during the economic adjustment programme. Responses of hours worked turn insignificant while wage dynamics for the full sample also lack the convergence pattern.

Figure 4: Baseline results
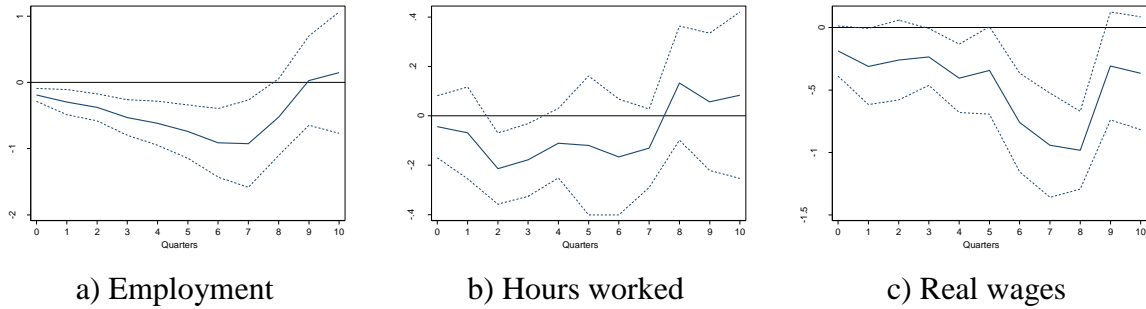
| a) Employment | b) Hours worked | c) Real wages |

Note: Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors.
Source: Hantzsche, Savšek and Weber (2018).

Next, we distinguish between tightening (positive) and easing (negative) spread changes to assess whether the employment, hours and wage responses are asymmetric (Figure 5). For our pooled sample, we find important asymmetries across adjustment margins. Employment increases following an easing shock (orange lines) by about the same extent as it falls following a tightening shock (blue lines) in the first four quarters after the shock. While the decline in the latter case extends into the second year, the increase in case of the easing shock is more short-lived. However, the responses of hours worked are notably different, showing no change in case of the tightening shock, but a significant and strong increase especially in the second year following the easing shock. Consequently, total hours worked react roughly symmetric to tightening and easing shocks. Concerning the real wage, we find no significant response for the easing shock, but a marked decline following the tightening shock. This asymmetry in the response may be a result of the sample period under analysis. The largest variation in both tightening and easing shocks materializes during and in the aftermath of the financial crisis. During this period, output has been below its potential (see Jarociński & Lenza, 2016). As a consequence, even if easing shocks have contributed to a closing of the output gap, for real wages to be under upward pressure a period of output above its potential would be required.

Figure 5: Tightening and easing shocks

| a) Employment | b) Hours worked | c) Real wages |

Note: Tightening (positive) spread shock blue (dark) line; easing (negative) spread shock orange (light) line. Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors.
Source: Hantzsche, Savšek and Weber (2018).

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2.3.2 Sectoral responses

In order to shed light on the drivers behind the three margins of labour market adjustment, we first analyse the role of the sectoral composition. Figure 6 provides estimates of impulse responses by sector, obtained by interacting sector dummies with the financing shock, as explained in section 2.2.1.

Figure 6: Responses by sector
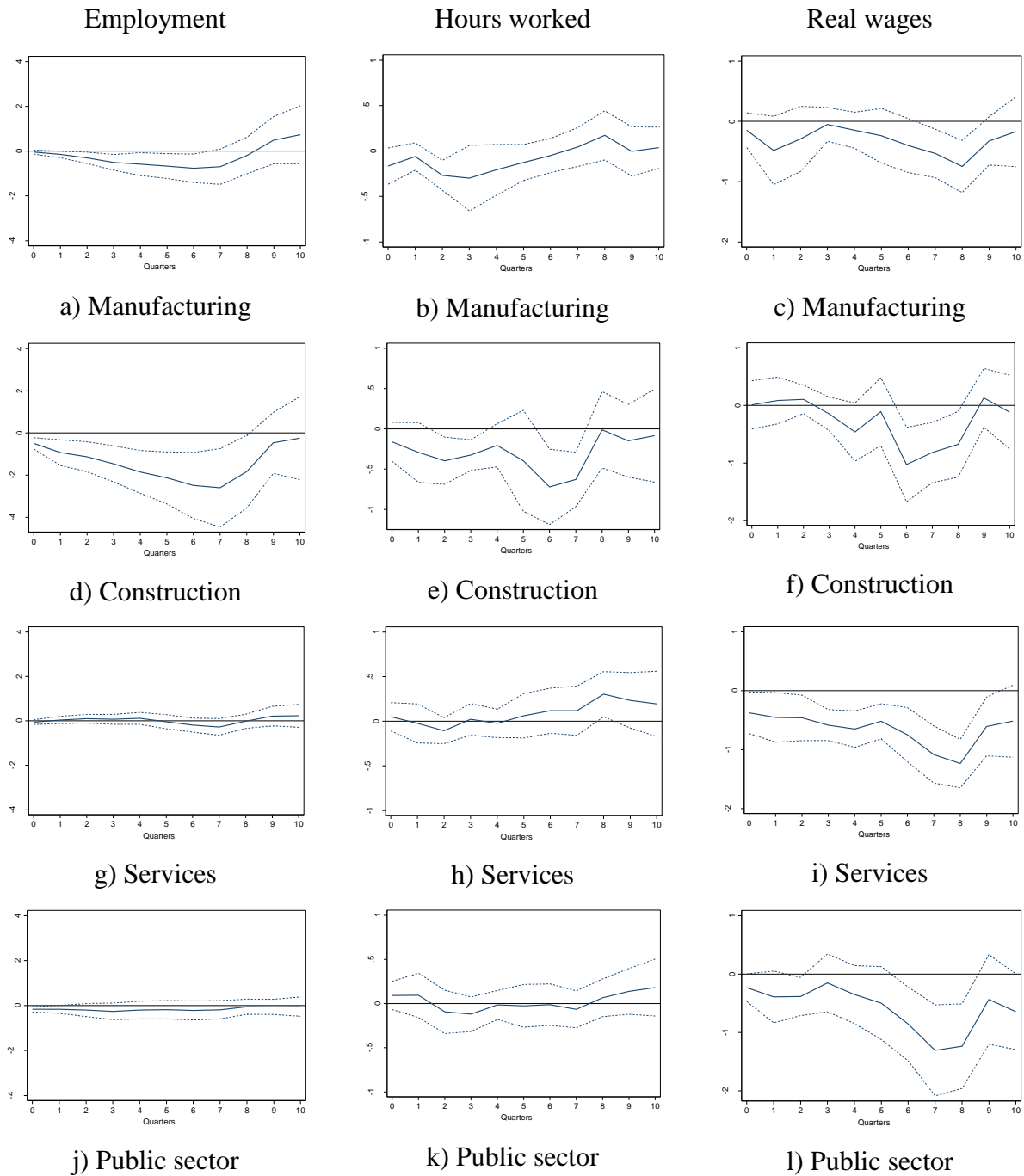
Employment	Hours worked	Real wages

a) Manufacturing   b) Manufacturing   c) Manufacturing

d) Construction   e) Construction   f) Construction

g) Services   h) Services   i) Services
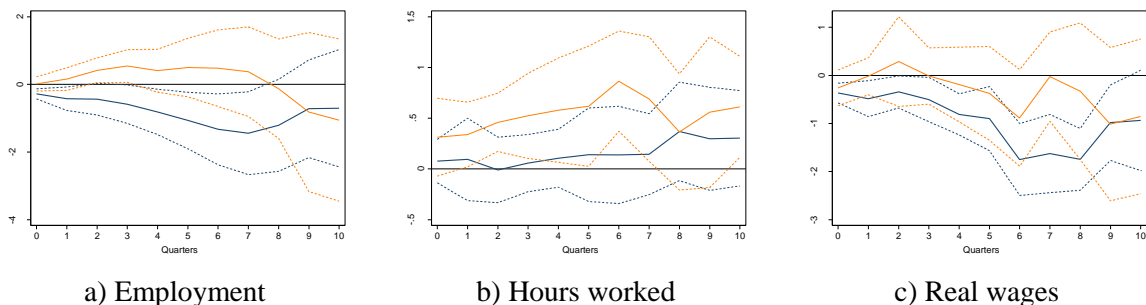
j) Public sector   k) Public sector   l) Public sector

Note: Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors.
Source: Hantzsche, Savšek and Weber (2018).

We find some evidence for a trade-off between adjustments along the wage margin relative to the employment margin. In manufacturing and construction, where employment reacts on impact following the financial shock (Figure 6a, d), real wages do not react significantly in the first year(s) following the shock (Figure 6c, f). There is also some evidence of an utilisation of hours worked in these two sectors (Figure 6b, e).

On the contrary, in the public sector, and even more substantially in the services sector, wage moderation following the financial shock (Figure 6i, l) seem to prevent initial employment falls (Figure 6g, j). These two sectors also do not experience on average any adjustment in hours worked following the financial shock. The relative adjustment strength of employment and real wages across sectors hinges on the role of rigidities in the average effective employment protection of the three private sectors. Sectors with higher effective EPL (services) are characterised by more muted responses in employment, but show more significant responses, for real wages in the first quarters after the shock. In construction, where effective EPL is less strict, adjustment is taking place more along the other two margins. This relationship is less evident in the public sector.

The sector's institutional set-up features both very high levels of unionisation, but also low levels of effective employment protection due to a large share of temporary workers. Impulse response estimates suggest a delayed adjustment of real wages in the public sector to financial conditions, and no marked sensitivity of employment and hours worked to financial shocks. The relative behaviour of the adjustment margins of the public sector compared to private sectors may be driven by factors other than cost considerations across the business cycle as also argued in Anderton et al. (2017).

2.3.3   Institutional effects

To better understand whether sectoral responses are affected by differences in labour market rigidities as suggested by the literature on the role of labour market institutions (Blanchard & Wolfers, 2000; Bassanini & Duval 2006; Abbritti & Weber, 2010), we analyse directly the role of labour market institutions in shaping employment, hours worked and real wage dynamics. Figure 7 draws a distinction between low- and high-EPL sectors, where impulse responses are calculated using the 20th and 80th percentile of the EPL sample distribution. When EPL is low, employment responds to the financing shock significantly negative on impact (Figure 7a). While the decline is mostly realised in the first year, employment reaches its low point after 7 quarters and reverts back in the subsequent period. High EPL, on the other hand, prevents a reduction in employment as the respective impulse response estimate is not significantly different from zero throughout the forecast horizon.

A similar result is found for union density, our second measure of labour market institutions (Figure 8). Sectors with a low level of union density see a reduction in employment following the shock, while the response of employment in sectors with a high level of union density remains very limited (Figure 8a).

Figure 7: Results for high and low EPL
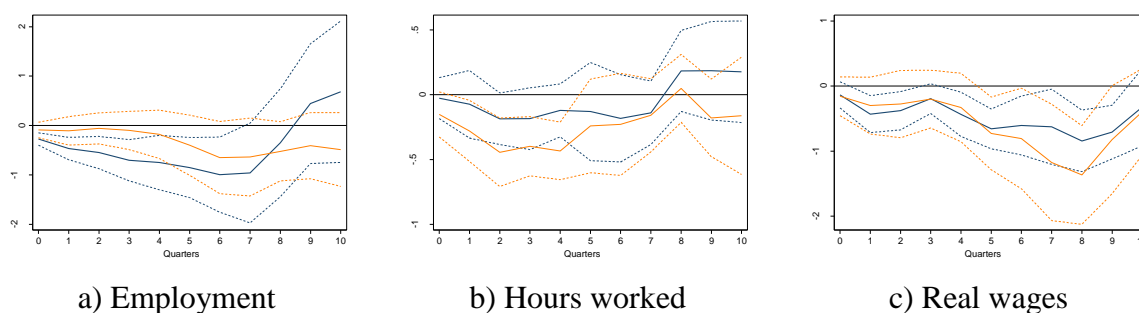
| a) Employment | b) Hours worked | c) Real wages |

Note: Low rigidity blue (dark) line (20th percentile of sample EPL); high rigidity orange (light) line (80th percentile of sample EPL). Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors.
Source: Hantzsche, Savšek and Weber (2018).

The more muted employment response for sectors with higher EPL or union density is mirrored by a stronger adjustment along the other two margins (Figure 7b, c and Figure 8b, c). Both, hours worked and to a lesser extent real wages per hour fall more strongly in sectors with more stringent EPL and higher union density. This suggests that when firms face higher costs of hiring and firing or unions are more powerful, the adjustment to cope with tighter financing conditions is shifted to other dimensions of the labour market which are relatively easier to adjust. The resulting overall adjustment in the wage bill (the sum of the three margins of adjustment) is not statistically different for high and low EPL cases. Thus, while more stringent EPL may protect employment relationships, it does not provide protection for the overall income of workers.

Figure 8: Results for high and low union density

| a) Employment | b) Hours worked | c) Real wages |

Note: Low rigidity blue (dark) line (20th percentile of sample union density); high rigidity orange (light) line (80th percentile of sample union density). Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors.
Source: Hantzsche, Savšek and Weber (2018).

In order to explore to what extent institutions can explain upward relative to downward rigidities, we finally combine our institutional analysis with our analysis of tightening relative

to easing shocks (Figure 9 and Figure 10).[17] We continue to find that high EPL prevents a downward adjustment of employment when financing conditions worsen (Figure 9a orange (light) line). However, this appears to be limited to the short-run. As time passes, the opposite appears to be the case: employment in high-EPL sectors adjusts somewhat more strongly one year after the shock. Findings for union density are very similar (Figure 10a). Concerning hours worked, there appears to be no noticeable impact for the tightening shock, irrespective of the level of EPL or union density (Figure 9b, Figure 10b).

Figure 9: Results for high and low EPL, tightening and easing shock

Employment	Hours worked	Real wages
a) Tightening shock	b) Tightening shock	c) Tightening shock
d) Easing shock	e) Easing shock	f) Easing shock

Note: Low rigidity blue (dark) line (20th percentile of sample EPL); high rigidity orange (light) line (80th percentile of sample EPL). Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors. Source: Hantzsche, Savšek and Weber (2018).

The corresponding real wage response after a positive spread shock is initially very similar across the two labour market institutions (Figure 9c, Figure 10c), whereas the recovery of wages appears to take place faster in the case of low EPL and union density. The different response of employment, hours and wages is more striking in the case of easing (negative) spread shocks (Figure 9d-f, Figure 10d-f). Sectors with low EPL or low union density experience a significant expansion in employment, which is facilitated by a lack of upward real wage pressure and even a temporary decline in real wages in the case of low EPL.

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[17] To do so, we further augment equation (2) by including interaction terms between the indicator for the sign of the shock, the shock itself and the labour market regulation indicator. Given this triple interaction, results should be interpreted with care.

Sectors with high EPL on the other hand, do not see an increase in employment levels, but an increase in hours worked per employee. While the contrast in the responses is rather stark, they are consistent with the view that high EPL prevents firms from stronger hiring in anticipation of possible future downward corrections and the associated costs. Thus, to meet higher demand, sectors that face higher EPL make more use of the intensive margin.

Figure 10: Results for high and low union density, tightening and easing shock
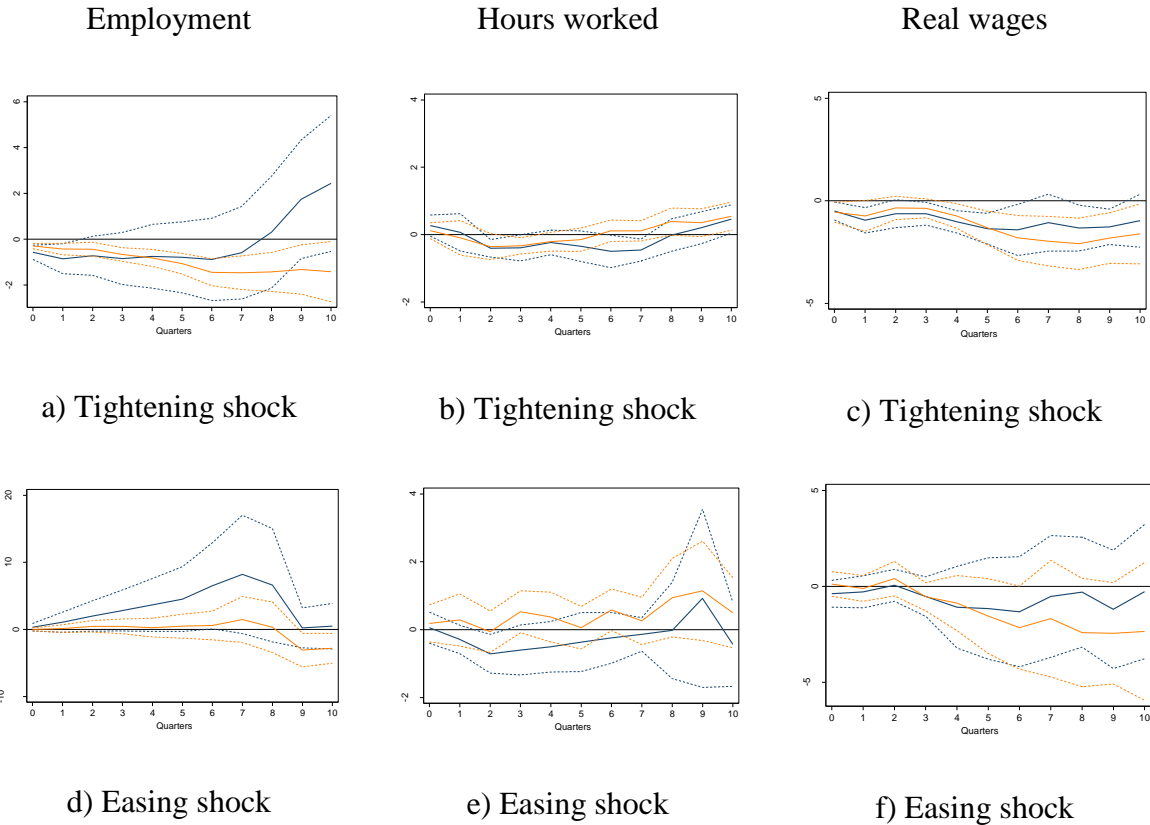
Employment	Hours worked	Real wages

a) Tightening shock	b) Tightening shock	c) Tightening shock
d) Easing shock	e) Easing shock	f) Easing shock

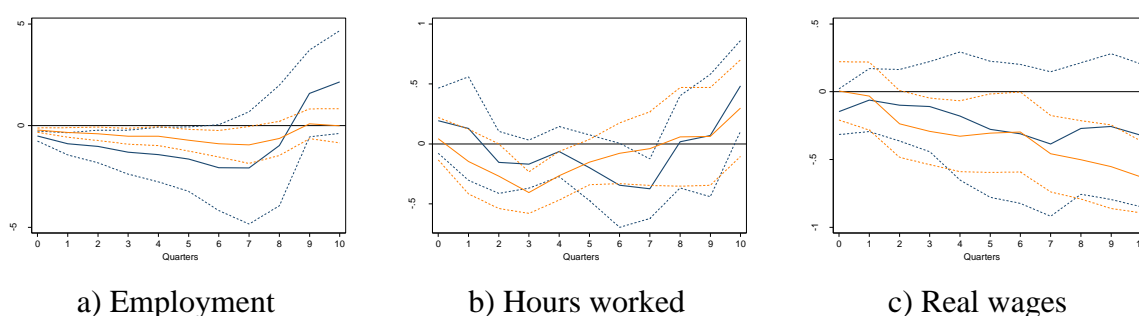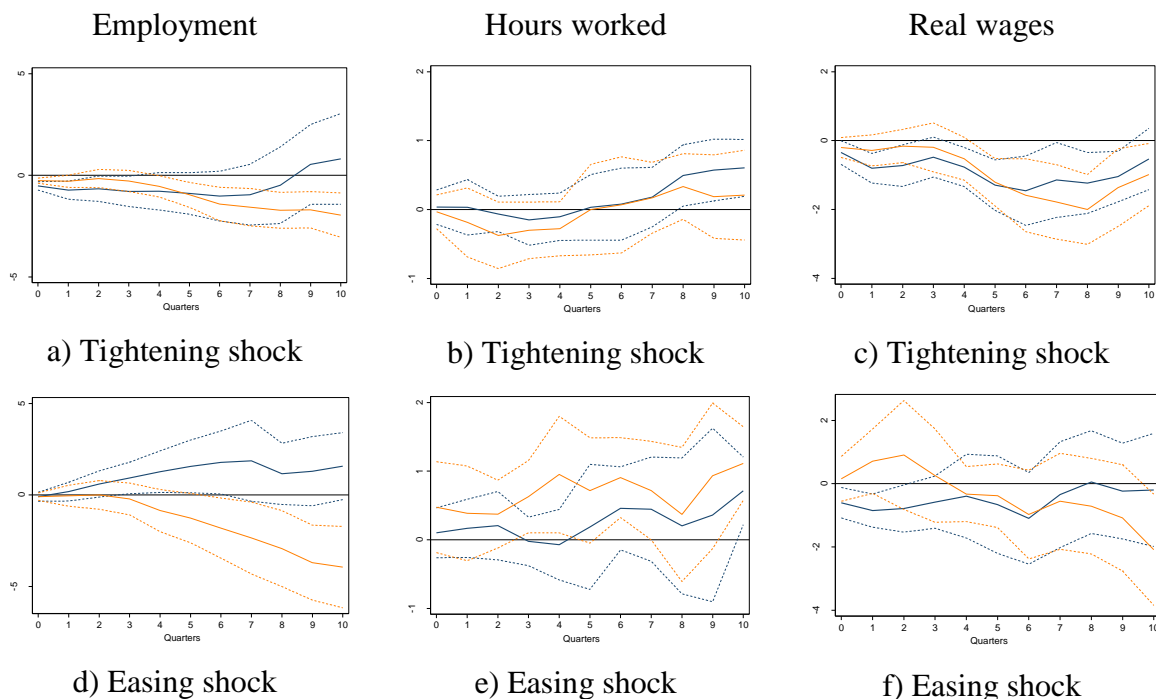*Note: Low rigidity blue (dark) line (20th percentile of sample union density); high rigidity orange (light) line (80th percentile of sample density). Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors. Source: Hantzsche, Savšek and Weber (2018).*

2.3.4   Robustness

Additional results in the Appendix show that our main findings are robust to alternative specifications. Including observations when countries were part of an economic adjustment programme (Figure B1) implies that employment and real wages respond to a similar extent as in the baseline estimation, but levels do not return back to the steady state after 10 quarters. This is not surprising given the protracted recession in these countries following the sovereign debt crisis. Excluding the public sector from the analysis (Figure B2) does also not change our results, but leaves impulse response close to identical to the baseline estimation.

We additionally re-estimate the main specifications using an alternative measure of financing conditions based on loan growth as defined in section 2.2.2 (Figure B3 - Figure B7 in the Appendix). Compared to the spread measure, our loan shock variable exhibits greater cross-sectional variation (Figure B3 compared to Figure 2 above). While largely following a similar pattern over time, the credit-based shock peaks during the global financial crisis of 2008/09 turning rapidly to tightening conditions after a prolonged period of credit easing, while spread shocks reach their maximum in 2011 as concerns about sovereign debt in the euro area took centre stage.

Using this alternative measure, we find comparable results for employment and real wages, but a different reaction for hours worked. More specifically, we continue to find a significant response of employment that is broadly symmetric for tightening and easing financial shocks and significantly smaller for sectors with higher employment protection and union density (Figure B4a, Figure B5a, Figure B6a and Figure B7a). Real wage responses are significant (Figure B4c) and the overall response appears to be driven by the response to tighter credit, which triggers a sustained fall in real wages similar to the results when using the spread shock (Figure B5c). The response of real wages is larger for sectors with high EPL (Figure B6c) and union density (Figure B7c), pointing also for the credit shock to the role institutions have in distributing adjustment to shocks across margins.

Differently to the spread shock, hours worked per employee increase in response to tighter credit conditions.[18] A plausible explanation for the difference in the response to the spread shock is that the latter has temporary effects on employment and wages, while the credit shock appears to be of permanent nature. As a consequence, the income effect dominates for the credit shock, and workers prefer to work more/less to compensate for part of the sustained fall/increase in income.

2.4   Conclusion

The financial crisis and the sovereign debt crisis have led to renewed divergence in unemployment rates in the euro area. The financial nature of the shock and countries' respective exposure to it paired with different labour market institutions are considered to be among the main determinants for the strong and heterogeneous labour market adjustment. In this paper we investigate this relationship, studying the dynamic labour market responses to changing financing conditions across countries and sectors in the euro area; highlighting the role of sectoral labour market regulations, as well as the role of asymmetries, in shaping the responses of three margins of adjustment: employment, hours worked and wages.

In line with theoretical predictions, our results confirm that all three margins of adjustment react negatively to an adverse financial shock. However, on average the reaction of hours worked per

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[18] The response is not driven by a specific sector or country.

employee is much more limited compared to the other two adjustment margins, confirming previous empirical studies for Europe. Our findings highlight asymmetries in the propagation of financial shocks. Distinguishing between positive and negative financial shocks, estimation results suggest that tightening financing conditions imply a stronger adjustment, particularly of employment and real wages. Furthermore, results taking account of the interaction between shocks and labour market institutions suggest that rather than limiting the overall response of the wage bill, labour market institutions seem to mainly affect the relative strength of the three adjustment margins. High EPL for example cushions the response of employment to tighter financing conditions, but firms compensate via stronger reductions in hours worked per employee and real wage wages, in sum leaving the average wage bill adjustment unchanged across institutional set-ups.

Furthermore, results tell a more cautious tale about the role of labour market institutions in cushioning shocks. The design of labour market institutions is no panacea. While its design might help prevent firms from shedding labour in times of crises and thus temporarily cushion employment from falling, the same set-up may hinder job growth when financing conditions ease. Paired with the findings that labour market institutions appear to affect the relative strength of the three adjustment margins rather than the overall response of the wage bill this raises two issues: First, the design of labour market institutions may largely be a question of distributional effects (e.g. insiders versus outsiders) and their implications. Second, other factors, which were not analysed in this study, such as the extent of credit frictions and the role of macroeconomic policies, are likely to be more relevant in cushioning the overall impact from financial shocks on the labour market.

3 WHAT ARE THE MAIN OBSTACLES TO HIRING AFTER RECESSIONS IN EUROPE?[19]

3.1 Introduction

When determining their optimal employment choice, firms need to take a number of factors into consideration. In line with the theory, shocks and institutions, but also more granular determinants, have already been listed in the literature, ranging from high uncertainty, unfavourable financial conditions, rigid institutional set-ups or supply-side factors, such as the shortage of skilled labour. Uncertainty, limited access to finance and persistence of shocks discourage firms to place new investments and thereby limit job creation. Inflexible institutions may imply high hiring or firing costs, making it harder for firms to adjust their labour input and thereby influence employment levels. Furthermore, supply-side constraints need to be carefully considered when hiring. For example, skills required by the firm may change, implying stricter entering conditions in some professions. Under the influence of rapidly changing labour market

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[19] This chapter closely follows Savšek (2018).

conditions due to robotisation, automation and digitalisation, the composition of employment is shifting, requiring substantial investment in education and skills. In addition, given the importance of institutional characteristics for labour market developments, how did the recent labour market reforms in several EU countries influence some of the above-listed factors?

In a nutshell, many factors are at work when studying employment dynamics, particularly after deep recessions, which call for further study.

In our paper, we try to explore factors, which are affecting hiring decisions of firms in the aftermath of the crisis in Europe. We exploit the Wage Dynamics Network (WDN) third wave questionnaire, which was undertaken between 2014 and 2015 and surveyed about 25,000 firms in 25 EU countries to learn about shocks, channels of adjustment, the role of labour market institutions and factors behind hiring decisions, which we study in this paper.

In particular, we investigate the relative importance of perceived factors influencing employment choice for workers on a permanent basis from the perspective of an EU firm in the aftermath of a severe recession. Overall, uncertain economic conditions are identified as the main factor, followed by the shortage of skilled labour, high payroll taxes, high wages and the risks associated with changes of labour laws. Limited access to finance, high costs of other inputs and high hiring costs were found to be somewhat less important. However, almost a quarter of firms reported that limited access to finance was an important factor. Furthermore, our results point to a strong cross-country heterogeneity in terms of perceived obstacles. For example, firms from countries, which were under adjustment programs, or Baltic countries reported hiring factors more frequently.

In addition, we assess the likelihood of reporting a given factor depending on firm-level characteristics. To do so, we augment our regressions with a number of explanatory variables, such as (firm-level) shocks, firms' and employment composition characteristics and wage bargaining institutions. In line with labour market theory, our results show that negative demand and finance shocks and the persistence of demand shocks negatively affect perceptions on factors underpinning the employment choice across a number of obstacles. In addition, smaller firms tend to have more problems with hiring. At the same time, a number of employment composition characteristics are also found to be significant after controlling for country- and sector-specific effects. In case a firm employs skilled, permanent and experienced workers, this generally reduces the probability of a firm stating that it had problems with hiring. Furthermore, any type of a wage bargaining agreement seems to increase this probability. While these results hold across a number of factors, it is not a universal finding. For example, the results for the skill shortage factor are sometimes reversed. Here, the persistence of negative demand shocks reduces the probability of a firm stating it had problems in finding the right skills. Our results also show that firms with a higher share of skilled and permanent staff are more likely to identify the skill shortage as a problem. This indicates that high-skilled workers are scarcer than low-skilled, while such workers also possess firm-specific human capital and therefore greater bargaining power.

Our analysis also suggests that labour market reforms have the potential to facilitate employment in the EU. While the evidence in this section is mainly descriptive, empirical results suggest that firms, which perceived higher labour market flexibility at the end of recession due to reforms of labour markets, also implied that some particular hiring factors were less pronounced.

The paper adds the following contribution to the existing literature. First, our dataset provides a unique opportunity to differentiate across a number of perceived factors underpinning the employment choice at the same time, while in the empirical literature authors usually tackled these one by one. Second, even though these factors were listed before in the empirical and theoretical literature, we are among the first ones to provide an assessment of their relative importance. Third, we show that shocks, institutions, but also firm-level characteristics, do matter in determining employment outcomes, but do not influence uniformly the perceived factors. Finally, we provide some further tentative evidence on the perceived impacts of labour market reforms in Europe.

The chapter is organized as follows. Section 3.2 presents the motivation and existing literature. Section 3.3 describes the data and the methodology. Results of the paper are presented in section 3.4 and summarized in section 3.5. Some tentative policy conclusions are also drawn in the final section.

3.2 Motivation and existing literature

Dynamic labour demand theory postulates[20] that optimal level of employment depends on a number of factors, including levels and volatility of demand in goods markets, levels of wages, tax wedge, financing conditions and hiring costs.

Empirically, the majority of the recent literature focused on the importance of institutional rigidities and shocks for employment outcomes.

For example, Bloom (2009) or Baker, Bloom and Davis (2016) show that high uncertainty, which should be seen as uncertainty regarding any variables that affect firms' cash flow, can reduce employment levels. It seems that effects on employment are particularly strong with worsened financial conditions. Boeri, Garibaldi and Moen (2013), for example, report that in such a recession larger responses of unemployment and hours worked compared to non-financial recessions can be expected. Boeri and Jimeno (2016) even argue that financial shocks seem to be more closely associated with cross-country changes in unemployment and GDP than demand shocks.

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[20] For further reference see for example Bagliano and Bertola (2004, Chapter 3) or Cahuc, Carcillo and Zylberberg (2014).

Empirically, responses of employment to shocks have been extensively studied particularly in interactions with institutional set-ups. As early as Giersch (1985), who pointed to the 'Eurosclerosis' phenomenon, European countries were seen to be too rigid to cope with severe shocks. The author identified wage rigidity as a key obstacle towards labour market clearing, manifesting in high and persistent unemployment rates. In addition, Barro (1988) named other institutional rigidities, which could have caused the observed persistence in unemployment. These included, for example, high union density or strict employment protection legislation (EPL), which are still very much present across the EU and could significantly affect employment. However, Bertola (1990) argued that job security provisions alone could not be blamed for high unemployment in the European countries.

In view of these findings, research started to focus on interactions between institutions and shocks. This interaction was, for example, studied by Blanchard and Wolfers (2000) in a panel of 20 OECD countries. The authors claimed that the rise in unemployment since the 1960s and also the increased heterogeneity among European countries should be attributed to both, shocks and institutions.

While there seems to be an agreement on the importance of labour market institutions for labour market outcomes, there is some disagreement on the implications of particular institutions. In the case of employment protection legislation (EPL), which effectively increases hiring/firing costs, Schivardi and Torrini (2004),[21] for example, show that EPL does influence firm size distribution in Italy, but its effects are quantitatively modest. Additionally, results of Boeri and Jimeno (2005) show that stricter EPL affects negatively job turnover, but even more strongly job destruction. On the other hand, Battisti and Vallanti (2013)[22] do not find significance of the EPL when testing the hypothesis that firing costs are significantly lower in firms that are unaffected by employment protection regulation. As a matter of fact, some papers provide mixed evidence. For example, a paper by Martins (2009) shows that the exemptions from procedural requirements for dismissal in Portugal seem not to have a significant effect on worker flows, however, firm performance seems to improve considerably in firms with lower firing costs, because wages there tend to fall more.

The impact of the degree of wage bargaining centralization on employment and wages seem to be even less conclusive. Outcomes seem to be driven by the actual bargaining power of unions and large cross-country differences in institutional set-up, which makes the theoretical

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[21] Results are consistent with the ones of Schivardi and Torrini (2008) and Kugler and Pica (2008), who also study the Italian labour market reform that increased firing restrictions for small firms in 1990. In addition, Cingano et al. (2016) show that the increase in hiring costs induced capital deepening and a decline in total factor productivity in small firms, relative to larger firms after this reform. Additionally, Mühlemann and Strupler Leiser (2015) show that hiring costs for small firms are associated with labour market tightness in Switzerland. Finally, for the EU-15, Millán, Millán, Román and van Stel (2013) show that strict EPL is negatively related to both hiring and firing decisions for very small firms.

[22] Bauer, Kasten and Siemers (2012) also finds insignificant impact of labour market regulations on job creation in Germany.

predictions less clear. For example, Dustmann et al. (2014) show that sector-level agreements in Germany have allowed differentiated wage setting, thereby supporting employment growth. On the other hand, Martins (2014) shows that the widespread use of extensions of sector agreements negatively affected employment in Portugal.

Other factors in determining optimal employment levels also cannot be neglected. High tax wedges, for example, reduce labour demand and supply and can as such reduce equilibrium employment. High taxes directly increase cost for firms. On the supply side, they reduce employee´s net salary, thereby reducing labour supply. These distortions are also affected by the progressivity and different schemes of household income taxation (Eissa, 1995; Disney, 2000; Jongen, de Boer & Dekker, 2015).

In addition, levels of wages can also affect equilibrium outcomes, as it is for example evident in cases where minimum wages are set at a too high level. It has been shown that high minimum wage can reduce employment prospects especially for the young and lower-skilled. In case of strong bargaining power of employers vis-à-vis low-skilled workers, a minimum wage can, on the other hand, improve earnings without compromising employment (see Boeri & Van Ours, 2013 and Boeri et al., 2015).

The importance of various labour market institutions and shocks for labour market outcomes was also confirmed by rapidly growing micro data studies, including the previous and the current WDN waves. Evidence from Galuscak et al. (2012), Bertola et al. (2012), Fabiani, Lamo, Messina and Rõõm (2015), and Boeri and Jimeno (2016), from WDN1, WDN1, WDN2 and WDN3, respectively, confirms that cross-country differences in Europe, once controlled for shocks, can be to a large extent attributed to different labour market institutions.

In addition to shocks and institutions, other features of labour market also need to be taken into account when studying employment adjustment. For example, Bils (1985) and Solon, Barsky and Parker (1994) showed that cyclical changes in the composition of employment could explain the apparently a-cyclical evolution of real wages. Properly controlling for these effects requires micro-data (see e.g. Carneiro, Guimarães & Portugal, 2012). In fact, interactions with institutions cannot be neglected even in this case. A number of papers showed that EPL influences the composition of employment, favouring permanent employment for prime age males and temporary jobs for other employees such as women, lower-skilled workers and immigrants (see e.g. Kugler, Jimeno & Hernanz, 2005; Kahn, 2007). This finding is validated also by Égert and Gal (2018).

These findings suggest that micro-perspectives of labour markets also need to be taken into account to get a good overview of labour market adjustments. In fact, the insider-outsider theory developed by Lindbeck and Snower (1984, 1988) suggests that employment and wage opportunities between the insiders, incumbent workers, and outsiders, who are only entering the job market, could be very different. The former seem to enjoy more favourable employment and wage opportunities than the newcomers. These findings are also important for current

employment developments in the EU. In fact, employment creation in the EU depends more and more on temporary and part-time work in the aftermath of the crisis (see Figure 11). The long-lasting effects of the crisis and high uncertainty could partly explain this phenomenon, while supply side factors, as explained later on, also need to be considered.

For example, rigid institutions, particularly high firing or hiring costs, could shift the burden of adjustment on less stable employment contracts, which we witness today. This issue was already investigated to some extent in some firm-level studies. Leonardi and Pica (2007) report no effect of higher EPL reform for Italy on entrants' wages, and decreasing returns to tenure in the first two years. In addition, in another study, Leonardi and Pica (2013) show that the average wage is reduced slightly when EPL is increased, but this difference seems to hide highly heterogeneous effects.

Other studies focused on educational characteristics of workers, which might drive hiring-firing patterns in Europe. A study by Blatter, Mühlemann and Schenker (2012) finds no evidence of a fixed cost component for hiring in Switzerland. Moreover, hiring costs increase with the hiring rate, skill requirements for job applicants and also depend on macroeconomic conditions. Such findings, in fact, highlight the importance of education.

Figure 11: Employment dynamics in different segments of labour market in the EU, base 2004Q1=100 (4 quarters moving averages)
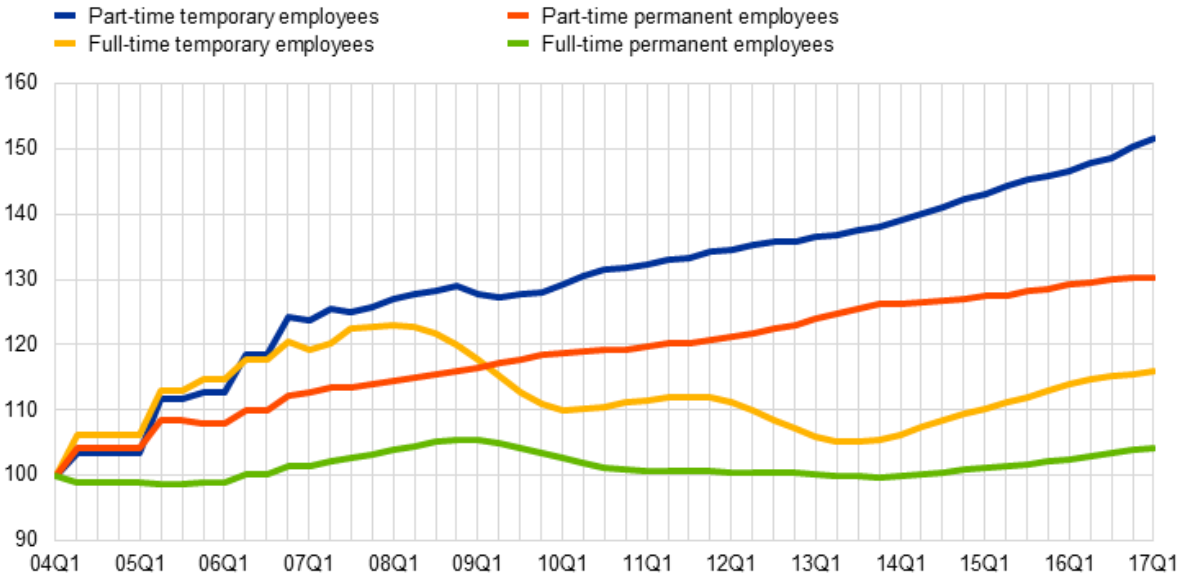
Source: Savšek (2018; adapted from Eurostat, Labour Force Survey - author's calculations).

In a more recent study by Blatter, Mühlemann, Schenker and Wolter (2016), substantial and increasing marginal hiring costs are recognized, which can be reduced by internal training, highlighting the importance of training and internal mobility of the workforce. Moreover, Forsythe (2014) finds that during recessions, the probability of being hired falls for younger workers, while for experienced workers it increases, suggesting an age-employment gap in

hiring after recessions. Furthermore, recent WDN papers by Izquierdo et al. (2017) and Izquierdo, Kosma, Lamo, Martins and Savšek (2018) argue that workers' and union's behavior was severely affected by the recent crisis and that employees'/firms' characteristics should be taken into account when studying post-crisis labour market adjustment.

As opposed to the above studies, our paper is the first one to cover a number of factors underpinning employment creation from a single survey questionnaire at the times when they should be the most pressing, i.e. after severe recessions. The data enables us to distinguish among several obstacles to hiring as perceived by a large number of EU firms and check their relative importance. Furthermore, we try to characterize these factors with a number of explanatory variables, such as shocks, firm-level characteristics and wage bargaining institutions. By doing so and taking into account at least partly the employment composition effects, we argue that these factors are sometimes driven by different characteristics.

Finally, while our evidence on the impacts of labour market reforms remains incomplete, we see a large discrepancy on hiring obstacles between firms that have perceived labour market conditions to be more flexible compared to all other firms. As a matter of fact, the perceived increase in flexibility is driven by firms in countries where significant labour market reforms were undertaken in the crisis period, highlighting the importance of reforms for labour market adjustment and employment creation in the EU.

3.3   Data and methodology

The most recent vintage of the WDN dataset was used in this study. The third wave of the survey (WDN3) was undertaken between 2014 and 2015 among the 25 countries participating in the European System of Central Banks and surveyed about 25,000 firms in Europe. The purpose of the survey was to assess how firms adjusted wages and employment to various shocks hitting them during the Great Recession. At the same time, the survey offers a direct reference to changes in the institutional setting and the role of labour market reforms, which took place in EU countries between 2010 and 2013.[23]

The subject of our analysis are factors underpinning the optimal labour choice, which can be also interpreted as obstacles to hiring. To this end, we create a series of dependent variables which follow from the survey question: "How relevant is each of the following factors as obstacles to hiring workers with a permanent, open-ended contract at the end of 2013?" It should be noted that answers reflect perceptions of firms after a severe recession in Europe and

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[23] The survey included firms from manufacturing, energy, construction, trade, market services, and financial intermediation and, for some countries, also non-market services sectors. However, in our sample, we exclude firms with less than 5 employees and firms operating in non-market services to establish homogeneity across countries since these types of firms were sampled only in some countries, bringing our sample to 23,226 firms. More information on the WDN and the latest sample can be found in Izquierdo et al. (2017), where also shocks and their correlations are reported.

therefore generalisation of the results to the overall employment dynamics, as in tranquil times, is very limited and needs to be made with caution. Firms were allowed to choose and tick any factor listed below and decide whether was either not relevant, of little relevance, relevant or very relevant. Factors/obstacles in the questionnaire included: uncertain economic conditions, shortage of skilled labour, limited access to finance, high firing costs, high hiring costs, high payroll taxes, high wages, risks of labour law changes and high costs of other inputs (see also Table 3).

As said, a firm was allowed to choose among a number of possibilities. For convenience, and also to reduce the number of regressions, we merge not relevant/of little relevance and relevant/very relevant categories. Following the theoretical and empirical literature from the literature review, we use firm-level characteristics from the survey to explain the likelihood of reporting a particular factor. To this end, we include a number of shocks, firms'/workers' characteristics and wage bargaining set-ups.

Table 1 also offers some descriptive statistics of our sample. Approximately 35% of firms in the sample reported to have experienced a moderate or strong negative demand shock, and about 20% of firms experienced a moderate or strong negative finance shock. A moderate or strong volatility/uncertainty of demand was reported by about 30% of firms in the survey. Out of those firms, which reported a strong negative demand shock, we also consider the ones that reported any type of a persistence in the demand shock. A large majority of firms reported no particular persistence, while about 10% of firms reported partly-lasting/long-lasting shock.

Table 1: Summary statistics of the WDN sample for the variables used

Firms'/Employees' characteristics	Number of observations	Average share of firms	Min	Max	Standard deviation
Type of the employment contract					
Permanent full-time	22,769	78	0	100	26.4
Permanent part-time	22,177	13	0	100	19.9
Temporary of fixed-term	21,644	10	0	100	32.4
Occupational groups					
Higher skilled, non-manual		26			
Lower skilled, non-manual	22,352	25	0	100	27.0
Higher skilled, manual	22,184	31	0	100	30.6
Lower skilled, manual	21,650	20	0	100	27.7
Job tenure					
Below 1 year	21,853	11	0	100	13.3
Between 1 and 5 years	22,258	29	0	100	20.5
More than 5 years	22,415	60	0	100	26.6

Wage bargaining institutions	Number of observations	Average share of firms
Firms with any type of a collective pay agreement	22,677	55

Shocks	Number of observations	Average share of firms experiencing a particular shock
Level of demand	22,870	
Strong decrease		10
Moderate decrease		27
Unchanged		21
Moderate increase		33
Strong increase		8
Access to external financing	22,369	
Strong decrease		7
Moderate decrease		15
Unchanged		62
Moderate increase		14
Strong increase		2
Volatility/uncertainty of demand	22,712	
Strong decrease		7
Moderate decrease		24
Unchanged		42
Moderate increase		22
Strong increase		5
Persistence of a strong negative demand shock*	22,526	
No strong neg. shock		90
Transitory neg. shock		1
Only partly persistent neg. shock		4
Long-lasting neg. shock		5

Note: Some categories do not sum to 100 due to rounding or employment weights, which are used to reflect overall employment. *only firms hit by a strong negative demand shock.
Source: Savšek (2018; adapted from WDN3), with some additional statistics.

Regarding firms'/workers' characteristics, a typical firm in the sample, on average, employs 90% of workers on a permanent basis, a large majority of them on a full-time basis. Others are employed either on a fixed-term or a temporary basis. Almost 60% of workers in a typical firm are skilled and 60% of them have tenure of 5 years or more. In the sample, about 10% of workers are newcomers, i.e. with a less than 1 year of tenure, and about 30% of them have tenure between 1 and 5 years. Finally, 55% of firms apply some type of a collective bargaining agreement. A final set of explanatory variables is presented in Table 2.

Table 2: The final set of explanatory variables included in the model

Explanatory variable	Type of the explanatory variable
Shock variables	*Firms hit by a moderate or a strong demand shock, dummy*
	Firms hit by a moderate or a strong finance shock, dummy
	Firms hit by a moderate or strong volatility/uncertainty of demand, dummy
	Firms hit by a less/more persistent negative demand shock
Firms'/workers' characteristics	*% of permanent workers in a firm*
	% of skilled workers in a firm (manual and non-manual - ISCO: 1, 2, 3, 7, 8)
	% of experienced workers in a firm (i.e. tenure more than 5 years)
Wage bargaining institutions	*Firm applied any type of a collective bargaining agreement, dummy*

Source: Savšek (2018).

On the basis of the obtained information, and because our endogenous variables are dummies, equal to one if the obstacles were found "very relevant" or "relevant" and zero otherwise, we define the following probit model[24]:

$$Prob(Y=1) = \Phi(\beta`x) \tag{4}$$

Where β is a vector of coefficients, x is a vector of explanatory variables, and $\Phi(.)$ denotes the cumulative normal distribution function.

3.4 Results

3.4.1 Descriptive analysis and theoretical predictions

This section starts with the descriptive analysis of the main variable of interest and continues with theoretical predictions underpinning the empirical part. We summarize the answers of firms in Table 3, corresponding to the prelisted factors/obstacles as being relevant or very relevant. Uncertain economic conditions are the main factor underpinning the employment choice. On average, 62% of firms in the survey reported that high uncertainty affects their hiring decisions and ranges from 26% in Austria to 91% in France. The second most relevant factor is the shortage of skilled labour. As many as 90% of firms in Estonia report it as an obstacle, while only 17% of firms in Hungary find it relevant or very relevant. EU average stands at 57%.

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[24] While the probit model is a standard in the micro applied work and was used also in other works based on WDN surveys (eg. Bertola et al., 2012), Galuscak et al., 2012), compared to the linear probability model it also ensures that the probability space is restricted between values 0 and 1. To at least partly address sectoral, country and firm-size unobserved heterogeneity, all regressions in the empirical part include country, sectoral and firm-size fixed effects. All regressions also include country group dummies, which follow Izquierdo et al. (2017), to control even more precisely for possible cross-country differences in the economic environment in 2013, such as the state of the business cycle, which might influence our results.

The following factors follow in terms of EU averages: high payroll taxes (55%), high wages (46%), high firing costs (41%) and the risks associated with changes of labour laws (40%). Limited access to finance (24%), high costs of other inputs (29%) and high hiring costs (30%) were found to be somewhat less important. However, overall results mask important cross-country heterogeneity. One thing a careful reader should observe is that firms from stressed and some Eastern-European and Baltic economies reported obstacles much more often than firms from non-stressed economic environments. For example, even in terms of access to finance, more than 60% of firms from Latvia said this was an important factor, whereas only 5% of firms from Austria reported this factor as an issue. There is also some evidence on sectoral and firm-size heterogeneity, which we report in the Appendix (Table B4 and Table B5, respectively). For example, smaller firms tend to report, on average, more obstacles to hiring. A similar conclusion can be also established for firms operating in the construction sector.

Table 3: Factors underpinning the employment choice at the end of 2013, % of firms, cross-country results

Country	Uncertain economic conditions	Shortage of skilled labour	Limited access to finance	High firing costs	High hiring costs	High payroll taxes	High wages	Risks of labour law changes	High cost of other inputs
AT	26	38	5	18	8	32	31	15	15
BE	77	74	23	63	44	75	73	54	36
BG	76	65	55	43	43	72	63	60	55
CY	80	23	40	28	17	44	34	20	26
CZ	66	60	39	56	30	64	42	39	33
DE	39	61	10	24	18	34	41	26	9
EE	62	90	46	36	36	81	81	38	46
ES	72	37	36	59	37	63	61	42	38
FR	91	75	24	58	34	81	48	63	45
GR	73	28	41	29	18	50	18	32	30
HR	77	58	48	59	49	71	44	61	63
HU	41	17	12	14	13	33	24	20	18
IE	74	57	39	36	37	66	64	39	37
IT	82	33	39	64	37	84	32	55	42
LT	59	77	17	50	39	81	73	44	32
LU	67	68	21	39	28	34	65	36	28
LV	65	85	63	46	35	74	76	44	41
MT	51	70	20	23	31	28	57	30	33
NL	79	43	25	44	18	39	49	40	20
PL	86	71	51	73	69	85	76	69	59
PT	83	42	35	66	46	65	44	55	49
RO	63	61	30	32	38	68	48	49	44
SI	79	49	47	53	46	78	43	49	37
SK	72	71	54	65	35	77	59	72	57
UK	41	59	13	17	23	30	37	22	19
Total	**62**	**57**	**24**	**41**	**30**	**55**	**46**	**40**	**29**

Note: employment-weighted figures used to reflect overall employment
Source: Savšek (2018; adapted from WDN3 data).

Several theoretical predictions on how our explanatory variables should impact the hiring factors can be postulated. Firstly, we expect that firms, which experienced negative and persistent shocks will, on average, be more likely to report each of the obstacles to hiring. The recession made such firms more vulnerable, which implies less hiring or even reduction of the work force. As a matter of fact, this is consistent with dynamic labour demand theory, which predicts that financial or demand shocks, as well as higher uncertainty, have a bearing on employment. Secondly, firms that use any type of collective bargaining agreement are more limited in determining wages, possibly shifting adjustment burden also on the other margins (see Hantzsche, Savšek & Weber, 2018). Third, regarding firm-level characteristics, ex-ante one could expect that bigger firms have more internal adjustment possibilities, such as reshuffling workers or covering for the absence of workers. Bigger firms are therefore expected to signal fewer obstacles to hiring. Regarding the tenure, skills and type of contract, the answer is less obvious. On the one hand, tenured, skilled and permanent workers are expected to have more experience and possess firm-specific human capital, which would increase the value of the firm. Therefore, such characteristics ought to flag more successful firms, which should, in turn, have fewer obstacles. On the other hand, these characteristics also imply increased bargaining power of employees, manifesting in pressures for higher wages and more protection, as the firm cannot simply find replacements. It might also be the case that result depends on the particular obstacle to hiring, as some of them are driven by cost considerations (high firing/hiring costs, high costs of other inputs, etc.), some by the demand-side (uncertainty, access to finance), some by the supply-side considerations (skill shortage, risk of labour law changes) and some by the high level of wages or taxation. The next section presents the model results, which help us to empirically evaluate these predictions.

3.4.2   Empirical results

In this section, we employ probit models to test for the significance of the above-mentioned explanatory variables, across a number of factors,[25] thereby providing a meaningful economic interpretation of our descriptive analysis. As suggested in the previous paragraph, we split these factors among several categories to improve the readiness of results.

Cost factors

As our baseline results (Table 4) show, shocks seem to be very important in characterizing various cost factors. In line with the literature review, shocks were also driving other adjustment

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[25] It should be noted that the question of the survey is very specific as it directly links factors to obstacles and that is also why we can use listed factors as our dependent variables. The alternative would be to use employment developments at the end of recession as a dependant variable and include factors/obstacles as explanatory variables. However, in the context of the WDN data, there is no question on the employment developments in the aftermath of the recession included and therefore such an exercise cannot be undertaken. To control at least partly for this drawback, a robustness check is made, where the evolution of employment of permanent employees between 2010 and 2013 is added to the baseline regression as an explanatory variable.

margins in the WDN3 wave (see Izquierdo et al., 2017). Indeed, firms hit by negative demand or finance shocks are much more likely to report cost factors as obstacles. In fact, as labour market theory would predict, firms are even more likely to reduce the workforce in these situations. Persistence of a negative demand shock and volatility of demand seem to have a bearing only on firing costs. Keeping employees on a payroll in this situation seems to be particularly costly for firms. Characteristics of employment composition, where significant, seem to affect cost factors in a similar manner, while wage bargaining institutions impact only the firing costs, possibly because the wage margin of adjustment cannot be used so effectively with wage agreements in place.

Table 4: Baseline probit regressions – cost factors

Explanatory variables	Factors/obstacles		
	High firing costs	**High hiring costs**	**Costs of other inputs**
Negative demand shock	0.15310***	0.06992***	0.07810***
	(6.802)	(3.069)	(3.379)
Negative finance shock	0.29664***	0.27475***	0.32153***
	(12.367)	(11.465)	(13.260)
Volatility of demand	0.10188**	0.01600	0.04589
	(2.066)	(0.324)	(0.929)
Persistence of a negative demand shock	0.04567***	-0.00128	0.00720
	(3.618)	(-0.103)	(0.573)
Share of permanent employees	-0.00321***	-0.00099*	-0.00139***
	(-5.820)	(-1.844)	(-2.585)
Share of skilled employees	-0.00095***	-0.00018	-0.00065**
	(-2.985)	(-0.563)	(-2.002)
Tenure of employees: more than 5 years	0.00049	-0.00176***	-0.00094**
	(1.353)	(-4.801)	(-2.548)
Any bargaining agreement	0.10023***	0.02998	0.04577*
	(3.971)	(1.167)	(1.760)
Country, size and sectoral fixed effects, as well as country group dummies, included	**yes**	**yes**	**yes**
Observations	19,308	19,292	18,821
Model degrees of freedom	40	40	40
Wald Stat	2983	1830	2021
Prob > chi2	0.000	0.000	0.000
Pseudo-R2	0.126	0.0808	0.0944
log likelihood	-11622	-11386	-11167

Note: robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, average marginal effects reported, unweighted regressions.

Source: Savšek (2018; adapted from WDN3), with additional statistics.

High wages and taxes

These two factors are separated from cost considerations to increase the readability of tables, but are effectively also increasing costs for firms, either directly or indirectly as firms need to pay higher labour expenses. Therefore, it is not surprising that results are very similar to the ones of costs considerations. Negative demand and finance shocks, as well as the persistence of a negative demand shock, are all increasing the probability of a firm reporting high payroll taxes or high wages as factors, which are constraining employment (Table 5). Similar finding holds for wage bargaining institutions.

Table 5: Baseline probit regressions – wages and taxes

Explanatory variables	Factors/obstacles	
	High payroll taxes	**High wages**
Negative demand shock	0.17221***	0.13581***
	(7.414)	(6.067)
Negative finance shock	0.33290***	0.25971***
	(13.125)	(10.857)
Volatility of demand	0.07003	0.03351
	(1.382)	(0.694)
Persistence of a negative demand shock	0.03712***	0.04028***
	(2.713)	(3.196)
Share of permanent employees	0.00068	-0.00041
	(1.241)	(-0.781)
Share of skilled employees	-0.00107***	-0.00027
	(-3.241)	(-0.871)
Tenure of employees: more than 5 years	-0.00115***	-0.00202***
	(-3.057)	(-5.624)
Any bargaining agreement	0.08055***	0.06647***
	(3.155)	(2.678)
Country, size and sectoral fixed effects, as well as country group dummies, included	**yes**	**yes**
Observations	19,360	19,301
Model degrees of freedom	40	40
Wald Stat	3269	2348
Prob > chi2	0.000	0.000
Pseudo-R2	0.144	0.0956
log likelihood	-10947	-12091

Note: robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, average marginal effects reported, unweighted regressions.
Source: Savšek (2018; adapted from WDN3), with additional statistics.

Demand factors

As expected due to the particular nature of these two (demand-side) factors, they are both very strongly correlated with (demand) shocks (Table 6). Particularly, the uncertain economic conditions factor relates somewhat stronger to the demand shock, as opposed to the finance shock, which relates closely to the insufficient access to finance factor. The uncertain economic conditions obstacle also relates significantly to the volatility of the demand shock. As regards employee characteristics, tenure of employee's effects both factors differently. It seems that with highly uncertain economic conditions, stable, long-term working relations might be put to the test, with the firm possibly preferring more flexibility in such times.

Table 6: Baseline probit regressions – demand factors

Explanatory variables	**Factors/obstacles**	
	Insufficient access to finance	**Uncertain economic conditions**
Negative demand shock	0.05950**	0.41627***
	(2.479)	(17.339)
Negative finance shock	0.87284***	0.33419***
	(35.430)	(12.444)
Volatility of demand	0.06466	0.27579***
	(1.257)	(4.755)
Persistence of a negative demand shock	0.02932**	0.11182***
	(2.263)	(6.964)
Share of permanent employees	-0.00180***	-0.00510***
	(-3.197)	(-8.303)
Share of skilled employees	-0.00038	0.00040
	(-1.143)	(1.182)
Tenure of employees: more than 5 years	-0.00128***	0.00150***
	(-3.331)	(3.921)
Any bargaining agreement	-0.01795	0.06005**
	(-0.666)	(2.291)
Country, size and sectoral fixed effects, as well as country group dummies, included	**yes**	**yes**
Observations	19,234	19,383
Model degrees of freedom	40	40
Wald Stat	3269	3196
Prob > chi2	0.000	0.000
Pseudo-R2	0.157	0.161
log likelihood	-10189	-10281

*Note: robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, average marginal effects reported, unweighted regressions.*
Source: Savšek (2018; adapted from WDN3), with additional statistics.

Supply factors

Judging on the size of coefficients, and as one could expect, supply-side factors are much less influenced by shocks than demand-side factors (Table 7 compared to Table 6). In addition, the skill-shortage factor depicts some interesting characteristics, particularly when looking at the employment composition. The higher share of skilled and permanent workers seems to increase the probability of a firm reporting this specific obstacle.

Table 7: Baseline probit regressions – supply factors

Explanatory variables	Factors/obstacles	
	Risks of labour laws being changed	Insufficient availability of labour with the required skills
Negative demand shock	0.09248***	-0.01894
	(4.139)	(-0.837)
Negative finance shock	0.22448***	0.08535***
	(9.474)	(3.549)
Volatility of demand	0.05312	0.00148
	(1.118)	(0.031)
Persistence of a negative demand shock	0.01575	-0.04583***
	(1.270)	(-3.635)
Share of permanent employees	-0.00253***	0.00157***
	(-4.843)	(2.919)
Share of skilled employees	-0.00137***	0.00166***
	(-4.356)	(5.185)
Tenure of employees: more than 5 years	-0.00082**	-0.00411***
	(-2.296)	(-11.234)
Any bargaining agreement	0.08068***	0.08845***
	(3.244)	(3.526)
Country, size and sectoral fixed effects, as well as country group dummies, included	**yes**	**yes**
Observations	19,233	19,344
Model degrees of freedom	40	40
Wald Stat	2067	2802
Prob > chi2	0.000	0.000
Pseudo-R2	0.0857	0.117
log likelihood	-12055	-11773

Note: robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, average marginal effects reported, unweighted regressions.
Source: Savšek (2018; adapted from WDN3), with additional statistics.

It appears likely that skilled and permanent workers possess more negotiating power, such that their retention is very difficult. At the same time, the high-skilled workers are also scarcer and more difficult to attract than the low-skilled. In addition, the persistence of a negative demand shocks reduces the probability of a firms stating it has problems in finding the right skills, possibly because 'pool of talent' is bigger after persistent shocks.

For example, recent highly-educated graduates cannot enter (still tight) labour markets easily or because the employed higher-skilled engage in job search more actively after recessions. Because our main question relates to the obstacles of hiring on open-ended contracts at the end of recessions, it might be valuable to check whether hiring decisions between 2010 and 2013 influence our results. To investigate this, and also to perform another robustness check of our baseline results, we add additional explanatory variable to our regressions (see Table B6 in the Appendix for the results).

In this case, the dummy variable takes value 1 if a firm decreased permanent employment in 2010-13, and zero otherwise (i.e. unchanged or increased permanent employment). While the baseline results of our analysis remain valid, it is interesting to observe that it is not uniformly true that firms, which were downsizing during the crisis and were potentially more vulnerable, also reported higher obstacles to hiring in the aftermath of the recession. While this is true for the majority of obstacles in the segment of costs considerations (high firing costs, high taxes and high wages) as well as for the uncertain economic conditions and access to finance, the opposite is true for the skill shortage obstacle. Downsizing in the less productive segments of labour force during the crisis might have created hiring space for more skilled workers in the aftermath of the crisis, with the crisis acting as a catalyst.

3.4.3 Does the increased flexibility help to reduce obstacles to hiring? The role of labour market reforms in facilitating labour market adjustment and hiring

To motivate this section, we start with some observations and descriptive charts from the WDN3 survey on the ease of adjustment as reported by EU firms. As presented recently in papers by Izquierdo et al. (2017) and Izquierdo et al. (2018), a number of firms in the WDN3 survey reported that it was easier to adjust labour inputs or wages compared to the pre-crisis period (Figure 12).

Figure 12: The ease of adjusting across a number of channels, 2013 in comparison to 2010
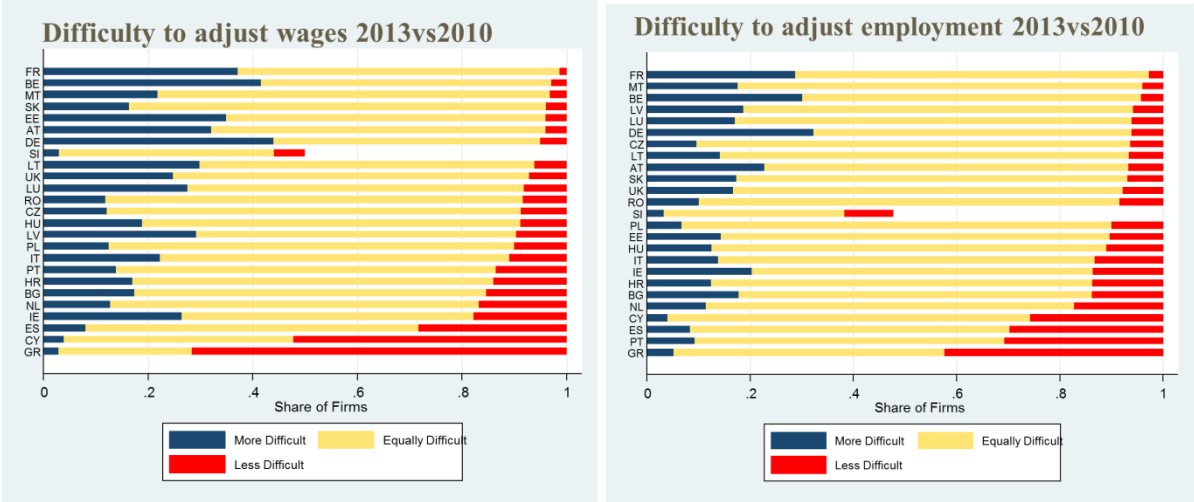
Figure 12 continued: The ease of adjusting across a number of channels, 2013 in comparison to 2010
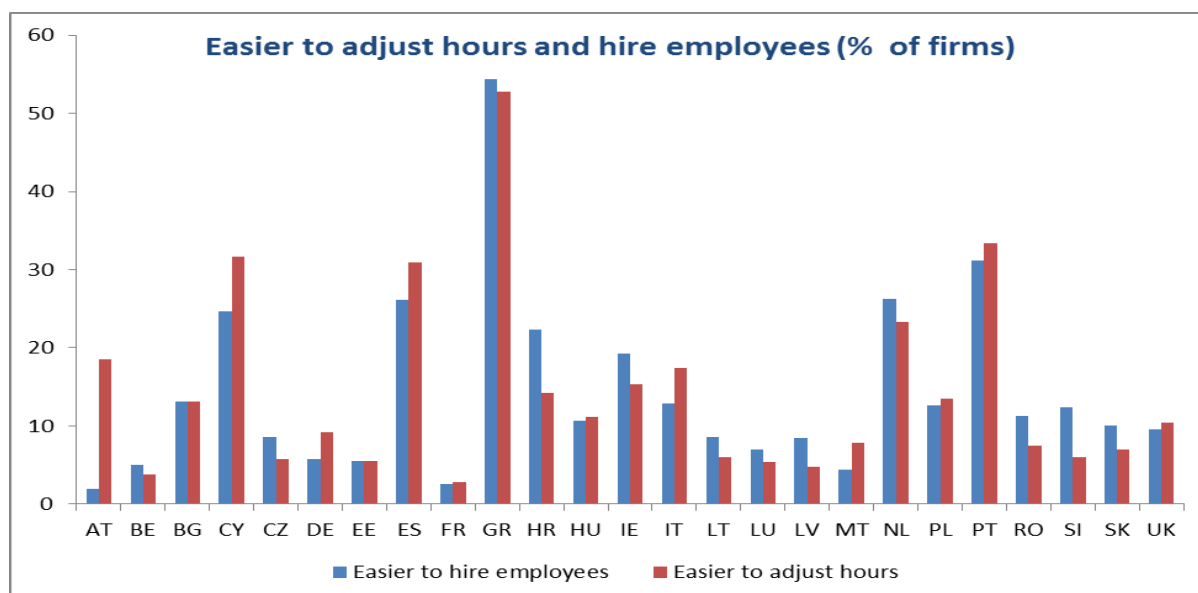
Note: In the Slovenian questionnaire, the question included an extra option and therefore results are not fully comparable. In charts with perceptions about employment and wage adjustments, the average proportion of firms across all the employment adjustment and wage adjustment channels is taken as a summary measure. For more details, refer to the papers quoted.
Source: Izquierdo et al. (2017) and Izquierdo et al. (2018), adapted from the WDN3 data.

The percentage of firms that reported the labour market being more prone to adjustment in the post-crisis period is particularly high in countries where significant changes to labour market and its structures took place. For example, more than 50% of firms in Greece report that adjusting wages, hiring employees or adjusting working hours was easier in the aftermath of the crisis compared to 2010. Higher percentages are also visible in other reforming countries, such as Spain, Cyprus and Portugal. At the same time, there is a significant number of companies, particularly from the non-stressed countries such as Belgium, France, Malta, Lithuania, Latvia, Germany, Czech Republic or Luxembourg, where no changes or even less flexible labour market settings were identified in the aftermath of the crisis.

For firms, where adjustment was easier, Izquierdo et al. (2018), identify reforms in labour markets as the driver behind the perceived changes. For example, Figure 13 shows that changes in the employment protection legislation (EPL) index associate nicely with the WDN indicator, which corresponds to the percentage of firms responding that adjusting the labour input was easier in 2013 than in 2010. In addition, Figure 14 shows that high costs of firing reported as obstacle factor, which we use in our regressions, also associates nicely with the EPL index.

Figure 13: Reforms indicator (EPL) and the ease of adjusting labour input (WDN3)

Finally, recent WDN3 evidence also suggests that labour market reforms were accompanied by changes in workers' and unions' behaviour. It seems that during a deep crisis, workers and unions are more prone to adjustment, with workers willing to accept lower wages and less stable employment relations as compared to the pre-crisis period.

Figure 14: High firing cost as an obstacle and the EPL index
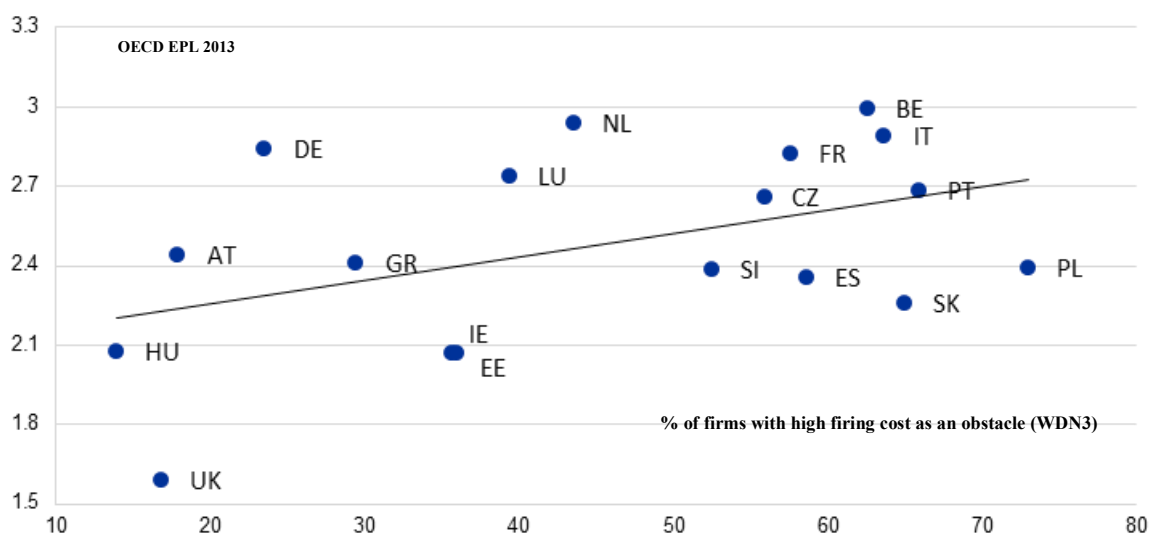
Note: The vertical axis displays the degree of protection of permanent workers against individual dismissals as measured by the OECD EPL index; the horizontal axis displays the importance of high firing costs as an obstacle to hiring (in % of firms, employment weighted) across EU countries.
Source: Savšek (2018; adapted from OECD, WDN3).

All this information needs to be carefully considered, as it will likely influence our results on factors underpinning the employment choice. To address this question, we augment our regressions for high firing costs, high hiring costs and high wages obstacles with an additional explanatory variable. In particular, we include dummy variables that take value 1 if a firm perceived it is (much) easier to lay-off employees individually due to reforms, (much) easier to hire employees due to reforms and (much) easier to adjust wages of new hires due to reforms, and zero otherwise, separately to the three corresponding regressions on obstacles. This is only done for those obstacles, where comparability with the reform measure is straightforward.

Table 8: Perceptions on reforms and their impact on selected factors/obstacles

Explanatory variables	Factors/obstacles		
	High firing costs	High hiring costs	High wages
Negative demand shock	0.15955**	0.08755	0.23938***
	(2.534)	(1.477)	(3.697)
Negative finance shock	0.20035***	0.27475***	0.24684***
	(3.333)	(4.429)	(3.764)
Volatility of demand	-0.10235	-0.23540*	-0.08569
	(-0.806)	(-1.781)	(-0.649)
Persistence of a negative demand shock	0.05401*	-0.01600	0.00628
	(1.825)	(-0.521)	(0.195)
Share of permanent employees	-0.00271**	-0.00242*	0.00201
	(-2.102)	(-1.850)	(1.415)
Share of skilled employees	-0.00064	-0.00024	-0.00096
	(-0.725)	(-0.279)	(-1.043)
Tenure of employees: more than 5 years	-0.00132	-0.00217**	-0.00152
	(-1.385)	(-2.359)	(-1.478)
Any bargaining agreement	0.00969	-0.07602	0.25286***
	(0.131)	(-1.175)	(3.288)
Reform variable	**-0.28308***	**-0.35324***	**-0.29825***
	(-4.505)	**(-4.849)**	**(-3.854)**
Country, size and sectoral fixed effects, as well as country group dummies, included	**yes**	**yes**	**yes**
Observations	19,233	19,234	19,344
Model degrees of freedom	26	26	26
Wald Stat	360.5	256.4	403.8
Prob > chi2	0.000	0.000	0.000
Pseudo-R2	0.114	0.0756	0.149
log likelihood	-1577	-1801	-1441

Notes: robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, average marginal effects reported, unweighted regressions. The reform variable, which is added separately to a regression, indicates a dummy that takes value 1 if a firm perceived it is (much) easier to lay-off employees individually due to reforms, (much) easier to hire employees due to reforms and (much) easier to adjust wages of new hires due to reforms, and zero otherwise.
Source: Savšek (2018; adapted from WDN3 - author's calculations), with additional statistics.

The results[26] in Table 8 show that firms, which reported that labour market reforms were the underlying reason for increased flexibility were less likely to report some of the hiring obstacles. In all three regressions, the new dummy variables capturing labour market reforms, come out as highly significant and negatively signed. While perceptions and actions of firms should not be confused and, therefore, the interpretation of results should remain in terms of associations, perceptions on increased flexibility due to reforms seem to importantly diminish the reported factors/obstacles in Europe.

3.5 Conclusion and policy implications

The WDN3 survey revealed numerous factors/obstacles underpinning the employment choice across EU countries. Overall, our results show that uncertain economic conditions are the most important factor, as argued by the EU firms, followed by the shortage of skilled labour, high payroll taxes, high wages and risks of labour law changes. As our descriptive results show, we observe substantial cross-country heterogeneity of these obstacles across countries, while for the sectoral composition there is less of a discrepancy. At the same time, smaller firms tend to report these factors more often.

In the following, we argue that characteristics at firm-level need to be carefully considered when studying employment adjustment at the end of severe recessions. In line with theory, our results show that negative demand and finance shocks negatively affect firms' perceptions of factors behind hiring decisions. Additionally, our analysis generally shows that a higher percentage of skilled, permanent and experienced workers reduces the probability of a firm declaring it had problems when hiring, while the existence of collective wage bargaining arrangements appear to increase it. However, this is not the case when considering the insufficient supply of skilled labour as a factor. In this particular case, the strong persistence of negative demand shocks actually reduces the probability of a firm stating it has problems in finding the right skills. Furthermore, high percentage of skilled and permanent staff employed by a firm, seems to increase the probability of reporting this factor as being important. Therefore, it follows from our paper that there is no universal set of firm-level characteristic which would uniformly explain all factors in the same manner.

Our empirical analysis also confirms that firms that have stated that the labour market is nowadays more flexible from hiring, firing and adjusting wages perspective, also perceived these particular factors as less binding. While due to the restricted sample the results should be

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[26] Unfortunately, the results of the analysis in this section are not directly comparable to the previous ones because the question on drivers of perceptions was a non-core question in the questionnaire. This implies that only a few countries (EE, ES, GR, HR, HU, IT, LU, PL, RO) asked this question in the survey, which drastically reduces the sample size, which now includes only about 2000 observations. These results need to be therefore interpreted with additional care.

interpreted with a greater caution, this finding suggests that labour market reforms have the potential to address some impediments across a number of factors.

Regarding policy prescriptions, overall there ought to be an element of caution given the difference in the institutional set-up across EU countries. In fact, this is further confirmed with our findings, which suggest that there is no 'one-size-fits-all' set of characteristics, which would explain all factors underpinning the employment choice in the same manner. Since the economic uncertainty is found to be the main impediment, macroeconomic policies should be credible in order to reduce the uncertainty to the extent possible. Second, given the importance of the reported skill shortages, reducing them via education, training and active labour market policies, appears to be crucial to equip workers with the right skills for the future. Our findings also suggest that structural reforms seem to have the potential to address some of the impediments behind the employment choice. However, further research is warranted to establish strong causality links between reforms and firms' actions, particularly as regards the optimal design of policy measures to protect potential losers.

CONCLUSION

This chapter summarizes the main findings of the thesis. It reviews the main results by answering the research questions that were presented in the introduction. In addition, this part also discusses the policy contribution of the thesis, the methodological contribution, deals with some shortcomings of the thesis and provides some possible extensions for future research.

The thesis tries to provide further insight into labour market developments during and in the aftermath of the crisis. In particular, it discusses the role of institutions and structural reforms for the EU labour markets, together with the policy implications of changing labour market structures in the aftermath of a deep crisis. As such, the thesis therefore does not deal with other important changes that are shaping labour market developments. In particular, it does not discuss long-term labour market changes, such as increases in income inequality, reductions of labour shares across the globe or ageing of population. It is also very silent on automation, robotisation and digitalisation, which have had strong impacts not only on labour market, but also utilize wider economic and social consequences.

The first part is a literature review, which sets the scene for the empirical exercise. In the literature review, the main methodological issues when measuring structural reforms and their implications are presented and explained. The literature review draws the following tentative conclusions.

First, new databases and modelling approaches have helped researchers and policy makers to become more confident about impacts of structural reforms. At the same time, it is still hard to identify and disentangle the causal effects of reform measures. Second, short-term impacts of reforms are potentially more difficult to measure in the first place, while reforms are made to affect the long-run steady state of the economy. Therefore, their short-term impacts should be interpreted with more caution. Finally, the question on how to build institutions that will help bring about a sense of reform urgency also in normal times is most probably the most difficult to answer. While there are some approaches which can stimulate broader reform agendas, further work is needed to understand how to incentivise reforms.

In the following two chapters, two empirical exercises are undertaken. The first one tries to explain the transmission of financial shocks to labour market adjustment margins. In line with the literature, it finds that contractionary financing shocks are depressing all three labour market adjustment margins. Furthermore, there is asymmetry present, depending on the sign and magnitude of the shock, sectoral composition and labour market institutions put in place. Furthermore, labour market institutions mainly affect the relative strength of the adjustment margins and not the overall response of the wage bill.

In the second empirical chapter the main factors underpinning the employment choice after recessions in Europe are studied. There, also links to recent labour market reforms from the EU firms' perspective are established. From the analysis, it follows that high uncertainty, shortage

of skilled labour and high payroll taxes are the main hindrances towards job creation in Europe after recessions. While negative demand and finance shocks negatively affect firms' perceptions of these factors, labour market structures and firms' and employment composition characteristics are also found to be significant. This indicates the importance of exploiting firm-level characteristics in determining labour market outcomes. Finally, the analysis shows that labour market reforms have a potential to address impediments towards employment in the EU. Since these are all survey results, which cannot, for example, fully reflect on macroeconomic labour market theories, caution is needed when generalizing results to the economy-wide developments. At the same time, combining our data with firm-level quantitative information, such as firms´ balance sheet information, would further improve the validity of the results.

Next paragraphs elaborate on these findings by answering the specific questions from the Introduction, starting with the methodological contribution.

1. Does the use of micro data improve the understanding of labour market institutions and structural reforms?

It follows clearly from the thesis that micro data provides a nice complement to more aggregated data, but its practical value depends on the particularities of the exercise. For example, the second empirical paper clearly shows that firm-level characteristics, such as size and sector, explain party the obstacles to hiring. These all indicate the importance of exploiting firm-level characteristics in determining labour market outcomes and, at the same time, calls for the use of micro data when studying impacts of reforms or institutions to reduce the omitted variable bias, provide models with additional input and control for various effects, which simply cannot be done with more aggregated datasets. This is further confirmed in the first empirical paper, which shows that much of the regulation on labour market is sector-specific and cannot be fully investigated, or controlled for, with the aggregated data.

However, micro data still cannot fully resolve all the issues connected to measuring impacts of reforms and institutions. For example, in many cases, micro level data is based on questionnaires, as it is the case in the second empirical paper. It goes without saying that in many cases this implies measuring perceptions of managers, employees etc. and not actual actions taken by the firm, which brings subjectivity into analyses. In addition, such questionnaires only take into account the views of firms that were questioned and to get an unbiased view, sample needs to be fully representative of the reality, otherwise it can bring self-induced selection bias in the analysis. While in the second empirical paper self-selection bias is naturally present, because we cannot control for firms that have not coped successfully with the recession, we at least know in which direction the potential bias goes. In many other cases, this simply cannot be done. In addition, in a number of cases, micro data is not feasible or cannot be used. For example, the methodology for theoretical contributions still relies heavily on macro datasets and using firm-level data is not even feasible within a majority of theoretical models. Furthermore, and as in the case of the WDN, surveys are sometimes made ad hoc and proper panel structure of the data cannot be established. Therefore, a number of fixed effects

cannot be controlled for. Last but not least, as opposed to many macroeconomic series, micro-data is not readily available and standardized and possessing access to micro level data usually involves additional costs or is connected with memberships to particular networks.

2. Is the local projection method a useful complement to other methodologies when studying impacts of reforms and institutions?

Part of the answer can be already found in the literature review. From there it follows that there is no universal methodology, which would be superior to others in the case of investigating impacts of reforms and institutions. Therefore, the use of a particular method should be driven by pros and cons connected to the specific research question and the dataset available. Part of the analysis uses the local projections approach introduced by Jordà (2005) and refined by Auerbach and Gorodnichenko (2013) to estimate the dynamic response of labour market variables to financing shocks. This method provides several advantages over standard VAR specifications. Specifically, it is less prone to misspecification, because each period is estimated separately and it can capture non-linearities in the impulse responses. This is important, because the basic auto-regression (VAR) models cannot capture such non-linearities. Additionally, a panel set-up with interaction effects between regressors can easily be implemented, which is needed to interact shocks and labour market institutions. At the same time, the method suffers from some disadvantages relative to a VAR specification. The further the horizon of the impulse response, the more likely it is that confidence intervals widen. This is a result of the requirement that in order to estimate the h-th period-ahead response, at least h lags are required for the data. However, also other approaches, including the VAR, usually suffer from the same problem. In addition, local projection methods do not account for shocks that materialise between t and t+h, which may bias estimation results, if shocks are one-directional following t and serially correlated. In the context of the thesis, the advantages of capturing possible non-linearities likely outweigh possible disadvantages. These are reduced by a sufficiently large time dimension of the sample and limited autocorrelation of the independent variables of interest.

In the following part, policy relevant research questions from the introduction are discussed in greater detail.

3. How do financial shocks propagate to all three labour market adjustment margins when also taking into account the difference between various labour market institutions and sectoral compositions of economies?

The recent recession, which was largely caused by financial sector misalignments, again opened up a debate on the importance of financial frictions and financial shocks for economies. The recent advances in the literature unambiguously show that financial shocks affect labour market adjustment beyond what is implied by 'ordinary' output slack considerations. This notion follows from both, theoretical models, which combine labour market search-and-matching with

some form of financial friction,[27] as well as from empirical models.[28] However, many models do not distinguish between the extensive (employment) and the intensive (hours per worker) margin of adjustment. When facing a strong negative shock, firms can adjust by scaling down the production through lower levels of employment, reducing the working hours per employee or maintaining profitability by reducing the costs from the wage bill for a given level of employment. In addition, Boeri and Jimeno (2015, 2016) argue that labour market institutions and employment policies will determine the decision regarding the chosen adjustment channel.

While the interaction of shocks and institutions was already studied intensively for Europe (see Blanchard & Wolfers, 2000; Bassanini & Duval, 2006; Bowdler & Nunziata, 2007, among others), the thesis incorporates all three margins of adjustment under financial shock at the same time. In line with theoretical predictions, the results confirm that all three margins of adjustment react negatively to an adverse financial shock. Following a positive spread shock of 56 basis points, employment decreases gradually until it reaches a 1% lower level around 7 quarters ahead. After that, employment starts converging back to its initial level. Furthermore, real wages also show a significant decline. Upon impact of the spreads shock, wages decline by around 0.3%, and up to another percentage point over the next two years and only converge to their initial levels more than 10 quarters ahead. Hours worked exhibits a statistically significant decline around six months after financial conditions tighten with convergence back to the initial equilibrium taking place around 8 quarters ahead. However, overall adjustment on this margin is very small on impact, confirming previous empirical studies for Europe (van Rens, 2011).

For the pooled sample, findings suggest important asymmetries across adjustment margins. Employment increases following an easing shock by about the same extent as it falls following a tightening shock in the first four quarters after the shock. While the decline in the latter case extends into the second year, the increase in case of the easing shock is more short-lived. However, the responses of hours worked are notably different, showing no change in case of the tightening shock, but a significant and strong increase especially in the second year following the easing shock. Consequently, total hours worked react roughly symmetric to tightening and easing shocks. Concerning the real wage, findings show no significant response for the easing shock, but a marked decline following the tightening shock.

Finally, results taking into account the interaction between shocks and labour market institutions, suggest that rather than limiting the overall response of the wage bill, labour market institutions seem to mainly affect the relative strength of the three adjustment margins, which is a novel finding in the literature. For example, high EPL cushions the response of employment to tighter financing conditions, but firms compensate via stronger reductions in hours worked per employee and real wage wages, in sum leaving the average wage bill adjustment unchanged across institutional set-ups. From the policy perspective, these results tell a more cautious tale

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[27] See for instance Christiano et al. (2011), Mumtaz and Zanetti (2016), Zanetti (2015), Ben-Mohamed and Salès (2015).

[28] See for instance Boeri et al. (2013) and Boeri and Jimeno (2016).

about the role of labour market institutions in cushioning shocks than previously thought. While its design might help prevent firms from shedding labour in times of crises and thus temporarily cushion employment from falling, the same set-up may hinder job growth when financing conditions ease. Paired with the findings that labour market institutions appear to affect the relative strength of the three adjustment margins rather than the overall response of the wage bill this raises two issues: First, the design of labour market institutions may largely be a question of distributional effects (e.g. insiders versus outsiders) and their implications. Second, other factors, which were not analysed in this study, such as the extent of credit frictions and the role of macroeconomic policies, are likely to be more relevant in cushioning the overall impact from financial shocks on the labour market. Both issues would be interesting to investigate in future research.

4. What are the main factors underpinning the employment choice after recessions in Europe, what is their relative importance and can they be further characterised?

Dynamic labour demand theory postulates that the optimal level of employment depends on a number of factors, including levels and volatility of demand in goods markets, levels of wages, tax wedge, financing conditions and hiring costs.

Empirically, the discussion on factors underpinning the optimal labour choice has attracted a lot of attention in economic research and identified shocks and institutions as the main drivers of employment outcomes in Europe. Already Giersch (1985) claimed that European countries became too rigid to cope with severe shocks. He identified wage rigidity as a key obstacle towards labour market clearing. In addition, Barro (1988) named other institutional rigidities, which could have caused the observed persistence in unemployment. These included, for example, high union density or strict employment protection legislation (EPL). On the contrary, Bertola (1990) maintained the view that job security provisions alone could not be blamed for high unemployment in the European countries. As discussed further in the paper by Blanchard and Wolfers (2000), the interaction between shocks and institutions is key for understanding labour market developments in Europe after 1960.[29]

At the same time, also more granular aspects of labour markets need to be considered when discussing employment developments. This, among others, includes employment composition and other firm-level characteristics. Consistent with the insider-outsider theory developed by Lindbeck and Snower (1984, 1988), differentiation between the insiders, incumbent workers, and outsiders, who are only entering the job market, can be very important for shaping labour market outcomes. For example, the insiders seem to enjoy more favourable employment and wage opportunities than the newcomers because they are already equipped with the right skills for the job or have access to proper training or simply possess the negotiating power because

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[29] Also, evidence from Galuscak et al. (2012), Bertola et al. (2012), Fabiani et al. (2015), and Boeri and Jimeno (2016), from WDN1, WDNI1, WDN2 and WDN3, respectively, confirms that cross-country differences in Europe, once controlled for shocks, can be to a large extent attributed to different labour market institutions.

they know the right people. Coherent with these findings, the WDN dataset provides a unique opportunity to combine a number of perceived factors behind the employment choice, assess their relative importance and characterise them with characteristics at firm-level.

On the first point, uncertain economic conditions are the main perceived factor/obstacle behind hiring employees after recessions in Europe. On average, 62% of firms in the survey reported that high uncertainty affects their hiring decisions and ranges from 26% in Austria to 91% in France. The second most relevant factor is the shortage of skilled labour. As many as 90% of firms in Estonia report it as an obstacle, while only 17% of firms in Hungary find it relevant or very relevant. The EU average stands at 57%. The following factors follow: high payroll taxes (55%), high wages (46%), high firing costs (41%) and the risks associated with changes of labour laws (40%). Limited access to finance (24%), high costs of other inputs (29%) and high hiring costs (30%) were found to be somewhat less important. However, there are important cross-country and size differences, while sectoral composition does not seem to be particularly relevant. For example, firms from stressed and some Eastern-European and Baltic economies reported obstacles much more often than firms from non-stressed economic environments. Even in terms of access to finance, more than 60% of firms from Latvia said this was an important obstacle, whereas only 5% of firms from Austria reported this factor as an issue. At the same time, smaller firms tend to have more problems with hiring, which can be explained by the fact that smaller firms have less adjustment margins compared to larger firms. For example, while larger firms can shift workers across positions or introduce shifts, this is not so easy with smaller firms.

On the second point, the results show that negative demand and finance shocks and the persistence of demand shocks negatively affect perceptions on these factors across a number of obstacles. These findings are in line with the theoretical predictions of economic models. A number of characteristics at firm level are also found to be significant after controlling for country and sector-specific effects. In case a firm employs skilled, permanent and experienced workers, this generally reduces the probability of a firm stating that it experienced problems with the employment choice. It seems plausible that such workers' characteristics imply greater internalization of more pressing conditions on labour market.

Furthermore, any type of a wage bargaining agreement increases the probability of reporting a particular factor, possibly suggesting less room for manoeuvre due to rigidity on one wage adjustment margin, which can be partly compensated with the employment adjustment. While this result holds across a number of factors constraining hiring, it is not a universal finding. For example, the results for the problem of skill-mismatch are sometimes reversed. Here, persistence of negative demand shocks reduces the probability of a firms stating it has problems in finding the right skills, possibly because 'pool of talent' is bigger after persistent shocks. My results imply that skilled and permanent staff seem to successfully protect their bargaining power if the skill shortage is the underlying reason for non-hiring. In fact, results signal that high-skilled workers are more difficult to attract than low-skilled workers, possibly also because they possess more firm-specific human capital. Overall, our results show that there is

no universal set of firm-level characteristics, which would explain factors in a uniform manner. From the analysis it follows, that characteristics at firm level also need to be considered when studying factors underpinning the employment choice because they provide additional insight into the labour market developments. To augment models with a larger set of relevant variables improves the understanding of the main drivers and it therefore should be utilized whenever feasible. Regarding possible extensions, the data cannot fully control for the endogeneity bias. Proper instrumental variables would shift the analysis from simple correlations to causation and could further validate the results. At the same time, combining our data with other more quantitative datasets, such as firms´ balance sheet information, would further improve the validity of results. Unfortunately, this cannot be done in the current wave of the WDN. In case another WDN wave would take place, this should be kept in mind and also reflected in the new questionnaire. In addition, and as argued by the first empirical paper, hiring decisions might also depend on other labour market institutions, which were not a part of the questionnaire and could improve and generalize our results even further. Finally, a panel structure of the data would enhance the analysis further because fixed effects could be better controlled for.

5. Did labour market reforms facilitate hiring in Europe, as reflected in the new WDN questionnaire?

As argued in the second empirical paper, the answer to this question needs to be addressed with even greater care. First, impacts of reforms in the analysis only refer to the non-core question of the WDN questionnaire, which reduces the sample to only nine EU countries and therefore reduces somewhat the ability to generalize results to the EU level. Second, broad reform packages on labour markets were undertaken only in a few countries. Third, and as discussed in the literature review, impacts of reforms mainly manifest in the medium to longer run. Therefore, the captured reform impacts from the questionnaire, which was undertaken during the crisis, might be even less obvious. Forth, the timing of reforms does not fully correspond with the timing of the WDN analysis. For example, in the case of Italy, a major reform of labour market was implemented when the sampling was already ending.

Taking into consideration all the above mentioned aspects, results of the descriptive and empirical analysis show that perceptions on the importance of structural reforms have an important impact on employment choice. In case a firm reported that labour market flexibility increased between 2010 and 2013 due to reforms, the probability that a particular factor is reported is lower. This result holds for the following three hiring obstacles where the link to reforms is straightforward: high wages, high hiring costs and high firing costs. The analysis thereby suggests that labour market reforms have a potential to address impediments towards employment in the EU, but further work is needed to better link micro and macro level evidence on the importance of obstacles to hiring, because causation is still not clearly established.

To conclude, I would come back to the tentative conclusions of the literature review. With newly developed methodologies and original data, researchers and policy makers became more confident in modelling structural reforms. At the same time, it is still hard to identify and

disentangle the causal effects of reform measures on economy due to lack of proper data, instruments and the problem of various factors, which cannot be fully isolated from reforms, since they yield the same outcomes as structural reforms. However, this does not imply that research on reforms is not valuable. It only says that it should investigate more in depth specific research question, for which a proper method and data can be found. Going around reform questions in this scientific manner, researchers can provide policy makers with the right design for reform action and thereby stimulate reform implementation. In addition, successful reform waves in a number of countries have shown that structural reforms can be a success and can improve standards of living. However, reforms should not be seen as a perfect solution for all problems, but rather as a complement to demand side policies. Finding the right balance and timing between them will probably need to be investigated heavily in the future. I hope that this thesis can contribute to this important debate.

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APPENDICES

Appendix 1: Summary in Slovenian language / Daljši povzetek disertacije v slovenskem jeziku

Recesija, ki je zajela države EU v obdobju med letoma 2008 in 2013, je med drugim razkrila nedovršene institucionalne okvire, v katerih delujejo države EU, še zlasti države evrskega območja. Upoštevajoč dejstvo, da je bila v drugem delu krize fiskalna politika nekaterih najbolj prizadetih držav omejena bodisi s pravili fiskalnega pakta oziroma z nezmožnostjo zagotavljanja spodbujevalnih ukrepov zaradi prevelikega javnega dolga, hkrati pa je bila denarna politika že izredno spodbujevalno naravnana, se je ekonomska politika številnih držav zopet osredotočila na strukturne politike. V najbolj prizadetih državah pa so bile strukturne reforme tudi pogoj za odobritev programov pomoči.

Osrednji cilj doktorske disertacije je poglobiti razumevanje na trgu dela v času krize in po njej ter odgovoriti na vprašanja, ki se tičejo strukturnih reform in institucionalnih rigidnosti na trgu dela v državah EU. Strukturne reforme definiram kot izboljšanje konkurenčnih pogojev prek sprememb pravil in institucionalnega okvira. Institucionalni okvir je definiran kot kompleksen sistem formalnih zakonov, regulacije, postopkov ter tudi manj formalnih dogovorov, pogodb, običajev in norm, ki urejajo socialno-ekonomsko aktivnost in obnašanje ekonomskih subjektov. Strukturne reforme naj bi državam zaradi izboljšane prožnosti pomagale pri izhodu iz krize, stimulirale rast na srednji in dolgi rok ter jih naredile odpornejše proti prihodnjim makroekonomskim šokom. Nekatere ocene kažejo, da bi lahko širši nabor strukturnih reform povečal BDP gospodarstev držav G20 za 2 % v naslednjih petih letih (OECD in IMF, 2014).

Čeprav okvir strukturnih reform zajema tudi trg produktov (včasih pa je definiran še širše), se v doktorski disertaciji osredotočam na trg delovne sile, katerega regulacija v veliki meri ostaja v domeni posameznih držav. Nadalje disertacija ne omenja številnih sprememb, ki so se med krizo zgodile na ravni EU oziroma evrskega območja, kot je na primer vzpostavitev evropskega stabilnostnega mehanizma, enotnega mehanizma nadzora bank ipd., ki so prav tako pomembno prispevale k trdnosti evrskega območja oziroma širše regije. Prav tako teza ne raziskuje pomembnih trendov na trgu dela, kot sta na primer povečevanje dohodkovne neenakosti, upadanje deleža dela v proizvodnji funkciji ali staranja prebivalstva. Zanemarjena pa so tudi področja avtomatizacije, robotizacije in digitalizacije, ki bodo v prihodnje pomembno zaznamovala dogajanje na trgu dela in verjetno povzročila izredne premike na ekonomsko-socialnem področju.

Glede na zgornjo definicijo in simulacije pozitivnih učinkov obsežnih reformnih programov bi skorajda lahko trdil, da so strukturne reforme čudežno zdravilo za gospodarstva držav. Prav zaradi tega bi lahko pričakoval, da jih bodo nosilci ekonomske politike nenehno implementirali, vendar zadnje raziskave kažejo ravno nasprotno. Strukturne reforme so namreč večkrat posledica kriz, medtem ko je v obdobju rasti njihova implementacija precej omejena (Dias Da Silva in drugi, 2017). Prav implementacija v obdobju gospodarskih kriz pa je sprožila debato o tem, ali so strukturne reforme v obdobju omejenega dometa fiskalne in denarne

politike sploh koristne in zaželene (Jacquinot in drugi, 2018). Nekateri raziskovalci namreč opozarjajo, da so lahko mogoči kratkoročni stroški, povezani z implementacijo reform v obdobju kriz, celo večji kot njihove koristi na srednji in dolgi rok (Eggertson in drugi, 2014).

Nadalje nekatere ekonomske raziskave kažejo, da so posebno problematične prav reforme na trgu dela, kot na primer delovna zakonodaja glede zaščite delavcev in spremembe nadomestil za brezposelne (OECD, 2004). Prav tako se zdi, da lahko kratkoročne stroške veliko lažje dodelimo posameznim prizadetim homogenim skupinam, medtem ko se dolgoročne koristi reform kopičijo dalj časa in se težje razporedijo med udeležence. Kaj lahko torej resnično pričakujemo od strukturnih reform na kratek oziroma srednji ter dolgi rok? In nadalje, če upoštevamo, da velika večina reform kaže pozitivne učinke, kako se boriti proti interesom ozkih skupin, ki bi rade ohranjale stanje nespremenjeno?

Uvodno poglavje omogoča širok vpogled v literaturo s področja strukturnih reform in institucionalnih rigidnosti na trgu dela. V tem poglavju kritično ovrednotim najpomembnejše prispevke s področja reform na trgu dela. Pri tem razlikujem med številnimi metodami in modeli, ki se uporabljajo za merjenje strukturnih reform in njihovih učinkov. Na začetku predstavim empirične modele za vrednotenje učinkov reform, kjer predstavim problem in potencialne rešitve endogenosti strukturnih reform. Problem za empirično analizo namreč je, da so lahko reforme precej prepletene z učinkom gospodarskega cikla, zato je njihove učinke težko osamiti. Nadalje se endogenost lahko odrazi tudi kot posledica problema merjenja reform. Za omejitev problema so sicer na voljo standardizirani indikatorji, vendar niti ti ne morejo popolnoma zajeti celotne kompleksnosti reforme in njenih učinkov. Prav tako so časovne vrste tovrstnih indikatorjev precej kratke in ne zajemajo vseh držav ali sektorjev. Na drugi strani pa so na voljo tudi bolj subjektivni načini merjenja reform, ki rešujejo nekatere zgoraj omenjene probleme, vendar pa v analizo hkrati vnašajo pristranskost. Zaradi tega se preučevalci učinkov strukturnih reform zanašajo na instrumente, ki odstranijo pristranskost v cenilkah, ali analizo nadgrajujejo z eksperimentalnimi metodami, ki so bile razvite v zadnjem obdobju.

V drugem delu predstavim teoretične modele merjenja učinkov. Za razliko od prvih sicer zajemajo veliko večje število mogočih kanalov transmisije in hkrati omogočajo analizo učinkov splošnega ravnotežja. Slednji za razliko od parcialnega ravnotežja lahko zaobjame celotne učinke reform prek večjega števila možnih dejavnikov sovplivanja. Na drugi strani pa so strukturne reforme v teh modelih predstavljene zelo abstraktno, kar pomeni, da ne morem zajeti učinkov zelo specifičnih reform. Slednje pa ne nazadnje pomeni, da lahko v teh primerih govorim o zelo posplošenih učinkih reform. Središče drugega dela so torej predvsem tako imenovani dinamični modeli splošnega ravnotežja (angl. Dynamic Stohastic General Equilibrium). Na koncu ovrednotim še literaturo s področja politične ekonomije strukturnih reform. V tem delu skušam pokazati predvsem, kateri so glavni dejavniki pri njihovi implementaciji.

Globljemu razumevanju tematike in razširitvi obstoječega poznavanja reform sta namenjeni naslednji dve poglavji. V prvem preučujem prilagoditvene kanale na trgu dela (zaposlenost, število opravljenih ur ter realne plače) v prisotnosti različnih institucij, sestave sektorjev ter različne jakosti in smeri finančnih šokov na trgu dela. Drugi del je namenjen analizi najpomembnejših dejavnikov pri zaposlovanju za nedoločen čas v EU po krizah in analizi učinkov strukturnih reform pri njihovem odpravljanju, temelječi na percepcijah podjetij iz vprašalnika WDN. Obe empirični poglavji sta še zlasti zanimivi, ker se analiza nanaša na obdobje pred krizo, med njo in po njej. Kriza je namreč pokazala, da so se nekatere povezave med ekonomskimi dejavniki v vmesnem času precej spremenile, zato je pridobitev celotnega vpogleda izrednega pomena za razumevanje trenutnega dogajanja na trgu dela, hkrati pa tudi informacija za (bolj) pravilno ekonomsko politiko v primeru prihodnjih gospodarskih kriz.

Raziskovalna vprašanja

Doktorska disertacija odgovarja na številna raziskovanja vprašanja, povezana z učinki strukturnih reform in institucionalnih rigidnosti, ki jih predstavljam v nadaljevanju. Razdelim jih lahko na metodološka vprašanja, ki se nanašajo na novosti pri uporabi podatkovnih baz in metodologij, ter vprašanja, ki so bolj povezana s prispevkom k nasvetom ekonomski politiki. Prvi dve raziskovalni vprašanji sta bolj metodološke narave, ostala pa bolj ekonomsko-politične.

1. Ali uporaba manj agregiranih podatkov izboljšuje razumevanje institucij in strukturnih reform na trgu dela?
2. Ali metoda lokalne projekcije uspešno dopolnjuje druge, bolj standardne metode preučevanja učinkov reform in institucij?
3. Kakšna je transmisija finančnih šokov na vse tri ključne spremenljivke na trgu dela, vključujoč razlike med različnimi institucijami trga dela in različno sektorsko sestavo gospodarstev?
4. Kateri so ključni dejavniki povpraševanja na trgu dela ob koncu recesije v Evropi z vidika podjetij, kakšen je njihov relativni pomen in ali se lahko dodatno pojasnijo s spremenljivkami na ravni podjetja?
5. Ali nova anketa WDN potrjuje, da so reforme trga dela v EU prispevale k večjemu zaposlovanju?

Podatki

Uporabljen nabor podatkov izhaja iz več statističnih virov. V prvem empiričnem poglavju uporabljam sektorsko specifične javno dostopne podatke za 15 držav evrskega območja za štiri največje gospodarske sektorje (gradbeništvo, storitve, predelovalne dejavnosti, javni sektor). Tri odvisne spremenljivke, uporabljene v regresijah, so realne plače, število opravljenih delovnih ur ter zaposlenost. Vse so pridobljene iz baze podatkov Eurostat in temeljijo na najnovejši klasifikaciji nacionalnih računov ESA 2010. Tudi kontrolne spremenljivke,

sektorsko specifična dodana vrednost in deflatorji izhajajo iz iste baze. Podatki o začasnem delu in zaposlitvah s skrajšanim delovnim časom so iz Eurostatove Ankete o delovni sili (angl. European Labour Force Survey), medtem ko sektorsko specifične serije institucij na trgu dela izračunam iz naslednjih dveh virov. Prvi se nanaša na delovnopravno zakonodajo (angl. Employment Protection Legislation, EPL) in je pridobljen iz baze podatkov Organizacije za ekonomsko sodelovanje in razvoj (angl. OECD) za zaposlene za nedoločen čas. Druga mera je pridobljena iz baze podatkov ICTWSS (Visser, 2015), kjer uporabim relevantno agregacijo sektorjev za pridobitev konsistentnih definicij NACE 2, ki se ujemajo s prej omenjenimi bazami Eurostata. Ker sta obe meri objavljeni le na letni ravni, je potrebna linearna interpolacija za pridobitev četrtletnih serij. Meri finančnih šokov sta pridobljeni iz baze podatkov Evropske centralne banke (ECB). Mera kreditne aktivnosti se nanaša na skupen obseg kreditov domačemu gospodarstvu, medtem ko so pribitki izračunani iz donosnosti do dospetja 10-letnih državnih obveznic nad nemškimi obveznicami.

V drugem empiričnem poglavju uporabljam najnovejšo anketo Wage Dynamics Network, ki sicer ni javno dostopna, a se lahko v primeru raziskovalnega projekta podatki pridobijo pri ECB. Tretja anketa (WDN3) je bila opravljena v obdobju med letoma 2014 in 2015 znotraj Evropskega sistema centralnih bank (ESCB), v njej pa je sodelovalo 25 centralnih bank. Vprašalnike je oddalo približno 25.000 podjetij. Države so se zavezale, da bodo vzorci odražali populacijo, končna harmonizacija podatkov pa je bila izvedena v ECB. Ker gre za anketne podatke, je treba posebej poudariti, da gre za kvalitativne podatke, kjer je prisotna tudi subjektivnost izprašanca, zato v analizi v tem delu govorim o percepcijah podjetij in ne o kvantitativnih kazalnikih. Prav tako je treba opozoriti, da anketa vključuje le podjetja, ki so prestala krizo, kar nedvomno povzroča pristranskost v mojih rezultatih. Vendar ekonomska teorija kaže, da lahko nakažem vsaj na smer pristranskosti, kar v številnih analizah, ki so narejene na podoben način, ni mogoče. Podjetja, ki se jim ni uspelo soočiti s krizo, so imela pri zaposlovanju zelo verjetno se večje probleme. Prav tako je potrebno poudariti, da gre za presek podatkov v določenem časovnem obdobju, kar dodatno omejuje posploševanje, hkrati pa le deloma naslavlja dinamično teorijo povpraševanja na trgu dela, saj gre za zaznave podjetij kot sledijo iz vprašalnika.

Ugotovitve

Doktorska disertacija ugotavlja in ovrednoti pomen institucij trga dela in reform za razumevanje delovanja trga dela v državah EU. Njen namen je osvetliti spremembe pri delovanju trga delovne sile, ki jih je prinesla gospodarska kriza, hkrati pa ugotoviti, ali so se spremenili tudi odnosi in razmerja, ki so bila vzpostavljena pred krizo. Ena glavnih empiričnih ugotovitev doktorske disertacije je spoznanje, da institucije trga dela pod vplivom finančnih šokov bolj spreminjajo relativna razmerja med posameznimi ključnimi spremenljivkami na trgu dela, in ne toliko absolutnega vpliva (na maso plač). Skupaj z ugotovljeno asimetrijo transmisije finančnih šokov je treba biti še posebno previden pri interpretaciji rezultatov glede pomena, ki ga imajo institucije trga dela. Institucija, ki lahko v času krize ščiti delavca pred

izgubo delovnega mesta, lahko v obdobju gospodarske rasti zavira ustvarjanje novih delovnih mest.

Nadalje ugotovitve kažejo, da je treba pri vprašanju zaposlovanja upoštevati tudi karakteristike podjetij in zaposlenih na mikro ravni, kar pa vpliva tudi na implementacijo reform, saj sporoča, da so tudi mikro podatki, ki jih pri analizi z makro podatki večkrat zanemarimo, prav tako pomembni. V nadaljevanju podrobneje predstavljam ključne ugotovitve. Začenjam z metodološkim prispevkom doktorske disertacije (vprašanji 1 in 2), nadaljujem pa z nasveti ekonomski politiki (vprašanja 3, 4 in 5).

1. Ali uporaba manj agregiranih podatkov izboljšuje razumevanje institucij in strukturnih reform na trgu dela?

Iz analize sledi, da uporaba mikro podatkov dobro dopolnjuje bolj agregatne podatke, vendar je njihova uporabna vrednost odvisna predvsem od analize, ki jo opravljam. Na primeru drugega empiričnega poglavja lahko ugotovim, da značilnosti na ravni podjetja, kot so velikost, sektor delovanja ipd., pomembno prispevajo k pojasnjevanju ovir pri zaposlovanju. Slednje kaže na potrebo po uporabi manj agregiranih podatkov pri preučevanju učinkov reform, saj lahko ekonomske modele razširim z naborom dodatnih spremenljivk in s tem obvladujem prej nepojasnjena medsebojna vplivanja. Tako pa povečujem informacijsko vrednost modela in zmanjšujem nepojasnjene učinke zaradi izpuščenih spremenljivk, kar je z bolj agregatnimi podatki precej težje storiti. Prav zaradi tega, ker je regulacija v veliki meri sektorsko specifična, že v prvem empiričnem poglavju uporabim sektorske podatke.

Kljub temu pa je treba opozoriti, da mikro podatki ne rešujejo vseh problemov, povezanih z merjenjem učinkov reform in institucij. Mikro podatki največkrat izvirajo iz anketnih vprašalnikov, zato so podvrženi subjektivnosti izpraševanca. Prav zaradi tega v doktorski disertaciji v drugem empiričnem poglavju govorim o zaznavah zaposlenih, menedžerjev ipd. in ne o dejanskem, kvantitativnem stanju v podjetjih. Nadalje lahko z vprašalniki zajamem le podjetja, ki še vedno obstajajo, ne pa tudi tistih, ki so v času krize propadla. S tem v analizo vnesem selektivnost vzorca, kar vpliva na pristranskost ocen. V primeru drugega empiričnega poglavja slednje ni tako problematično, saj lahko prek ekonomske teorije pojasnim, v katero smer so rezultati pristranski, kar pa v številnih drugih primerih ni mogoče.

In ne nazadnje, v številnih primerih uporaba mikro podatkov sploh ni mogoča ali pa metodologija, kot je to na primer v teoretičnih modelih, njihove uporabe še ne omogoča. Za razliko od makroekonomskih časovnih serij, ki so lažje dostopne in standardizirane, so mikro podatki večkrat podvrženi birokratskim postopkom glede varovanja podatkov ali dodatnim stroškom zaradi pridobitve dovoljenj oziroma članstev v združenjih, kjer so ti podatki na voljo. Slednje je vidno tudi v primeru podatkov WDN, ki so bili narejeni le v določenem časovnem preseku, zato nekaterih učinkov, ki bi jih bilo mogoče zajeti s panelno strukturo podatkov, ne moremo ovrednotiti.

2. Ali metoda lokalne projekcije uspešno dopolnjuje druge, bolj standardne metode preučevanja učinkov reform in institucij?

Na vprašanje vsaj deloma odgovorim že v pregledu literature. Ena glavnih ugotovitev tega dela namreč je, da najboljša metoda za merjenje učinkov reform in institucij za zdaj ne obstaja, saj imajo vse različne slabosti. Prav zaradi tega je uporaba določene metode bolj posledica specifičnega znanstvenega vprašanja, ki ga rešujemo, oziroma tem, kakšna vrsta podatkov je sploh na voljo. V primeru prvega empiričnega poglavja v doktorski tezi uporaba metode lokalne projekcije, ki jo je razvil Jordà (2005), izboljšala pa Auerbach in Gorodnichenko (2013), koristi pretehtajo stroške, ki bi jih prinesla uporaba bolj standardnih metod. Metoda lokalne projekcije je (za razliko od vektorskih avtoregresij (VAR)) manj podvržena napačni specifikaciji modela, saj se ocenjuje za vsako obdobje posebej. Prav tako lahko zaobjamem nelinearnosti v funkcijah impulznih odzivov. Glede na to, da je eden izmed ciljev tega dela doktorske disertacije preučevati mogoče nelinearnosti v odzivih na finančne šoke, je to ena izmed pomembnih prednosti glede na osnovni model VAR. Poleg tega metoda lokalne projekcije dovoljuje tudi uporabo panelne strukture podatkov, zato lahko interakcije med regresorji zelo preprosto implementiram. To mi omogoča preučevati sovplivanja med finančnimi šoki in institucijami na trgu dela, kar bi bilo sicer precej težje. Kot sem že omenil, ima metoda tudi določene pomanjkljivosti. Na primer, daljši kot je horizont funkcije impulznega odziva, večja je verjetnost, da postanejo intervali zaupanja široki. Slednje je posledica tega, da moram za oceno h-tega odziva imeti vsaj h odlogov, kar je sicer lahko problem tudi pri drugih podobnih metodah. Prav tako je pri metodi lokalne projekcije omejitev tudi, da ne more upoštevati šokov, ki se zgodijo med obdobjema t in t + h, kar lahko povzroči pristranskost v ocenah, če so šoki enosmerni in medsebojno povezani. Omenjene probleme v mojem primeru zmanjšujeta dolga časovna serija podatkov in majhna medsebojna povezanost neodvisnih spremenljivk.

3. Kakšna je transmisija finančnih šokov na vse tri ključne spremenljivke na trgu dela, vključujoč razlike med različnimi institucijami trga dela in različno sektorsko kompozicijo gospodarstev?

Gospodarska recesija, ki je bila v veliki meri posledica zapletov v finančnem sektorju, je ponovno odprla razpravo o pomembnosti finančnih trenj in s tem povezanih šokov za gospodarstvo. V primeru trga delovne sile so raziskave pokazale, da finančni šoki vplivajo na trg dela bolj, kot bi to narekovala 'navadna' gospodarska vrzel. To se kaže tako v teoretičnih modelih, ki združujejo neskladja na trgu dela z različnimi oblikami finančnih zapletov,[30] kot tudi v empiričnih modelih.[31]

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[30] Slednje na primer preučujejo Christiano in drugi (2011), Mumtaz in Zanetti (2016), Zanetti (2015) ter Ben-Mohamed in Salès (2015).

[31] Slednje na primer preučujejo Boeri in drugi (2013) ter Boeri in Jimeno (2016).

Pri obeh vrstah modelov pa je problem tudi v tem, da največkrat ne vključujejo vseh treh kanalov, prek katerih lahko poteka prilagajanje. Namreč, ko se podjetja soočijo s finančnim šokom, lahko zmanjšano proizvodnjo izravnajo z manjšo zaposlenostjo, zmanjševanjem števila opravljenih ur ali z nižjimi plačami, pri čemer lahko ohranijo nespremenjeno raven zaposlenosti. Boeri in Jimeno (2015, 2016) sta mnenja, da so pri odločitvi glede izbranega kanala prilagoditve najpomembnejše prav institucije na trgu dela.

Sovplivanje med šoki in institucijami je bilo v Evropi že raziskano (glej npr. Blanchard in Wolfers (2000), Bassanini in Duval (2006), Bowdler in Nunziata (2007)), vendar moj model (za razliko od omenjenih) združuje vse tri prilagoditvene kanale hkrati. Skladno z napovedmi teoretičnih modelov rezultati kažejo, da se vsi trije prilagoditveni kanali odzovejo negativno na neugoden finančni šok. Ko se pribitki na finančnih trgih povečajo za 56 bazičnih točk, se zaposlenost v naslednjih sedmih četrtletjih v povprečju zniža za 1 %, kasneje pa se zaposlenost počasi približuje začetnemu stanju. Tudi realne plače se odzovejo negativno. Nemudoma se zmanjšajo za 0,3 %, v naslednjih dveh letih pa še za približno eno odstotno točko, nakar se počasi približujejo izhodišču, ki ga dosežejo čez približno 10 četrtletij. Po približno pol leta se zmanjša tudi število opravljenih ur, vendar precej manj kot v primeru drugih dveh kanalov prilagoditve, kar je skladno s prejšnjimi empiričnimi raziskavami za Evropo (van Rens, 2011).

Nadalje model razlikuje med ugodnimi in neugodnimi finančnimi šoki. Ugotovitve kažejo, da obstajajo pomembne asimetrije v transmisiji šokov. Kot posledica prizanesljivih šokov se zaposlenost v prvem letu poveča za približno toliko, kot upade v primeru negativnih šokov, vendar je upad vztrajnejši, saj se nadaljuje tudi v drugem letu. Na drugi strani pa je odziv opravljenih ur drugačen, saj se te ne odzivajo v primeru negativnega finančnega šoka, medtem ko se opravljene ure povečajo v primeru pozitivnega vpliva, še zlasti v drugem letu. Posledica tega je, da se skupno število opravljenih ur odziva precej simetrično na pozitivne in negativne finančne šoke. Glede realnih plač ne najdem statistično značilnega vpliva ugodnega finančnega šoka, medtem ko se plače v primeru neugodnega dogodka močno znižajo. Tovrstne ugotovitve potrjujejo prejšnja dognanja, vendar so v tem primeru pojasnjena znotraj enotnega modela.

Prav tako so se prejšnje raziskave osredotočale predvsem na absolutni odziv posameznih prilagoditvenih kanalov, medtem ko ugotovitve v tezi kažejo, da institucije na trgu dela vplivajo predvsem na relativni pomen posameznega prilagoditvenega kanala. Zakonodaja, ki močno ščiti zaposlene, lahko v primeru negativnega finančnega šoka prepreči odpuščanja, vendar podjetja to nadomestijo z zmanjševanjem opravljenih ur in nižjimi plačami, kar na maso plač (kljub različnim institucijam na trgu dela) ne vpliva. Z vidika prispevka k ekonomski politiki je slednje izrednega pomena, saj ugotavljam, da je treba biti pri tolmačenju vpliva institucij na trgu dela še posebno previden. Na primer, medtem ko lahko določena institucionalna oblika na trgu dela preprečuje upad zaposlenosti v času finančnih kriz, lahko ista oblika preprečuje ustvarjanje novih delovnih mest v primeru prizanesljivih finančnih šokov.

Če upoštevam še ugotovitev glede relativnega (in ne absolutnega) pomena, ki ga imajo institucije na trgu dela, pa sta na mestu naslednji vprašanji, ki sicer presegata spoznanja doktorske disertacije in bi si zaslužili posebno poglavje. Prvič, institucionalni okvir je v veliki meri odvisen od distribucijskih učinkov, ki v primeru doktorske disertacije niso zajeti in analizirani. Drugič, drugi dejavniki, kot so na primer druge makroekonomske politike, lahko pomembno vplivajo na transmisijo šokov na gospodarstva. Oboje prepuščam bodočim raziskovalcem.

4. Kateri so ključni dejavniki povpraševanja na trgu dela ob koncu recesij v Evropi, kakšen je njihov relativni pomen in ali se lahko dodatno pojasnijo s spremenljivkami na ravni podjetja?

Dinamična teorija povpraševanja na trgu dela predvideva, da podjetja določijo optimalno raven zaposlenosti glede na številne faktorje, vključujoč povpraševanje po izdelkih in volatilnost povpraševanja, raven plač, obdavčitev dohodka, finančne pogoje ter tudi stroške odpuščanja oziroma zaposlovanja. Empirično ovrednotenje omenjenih faktorjev ima sicer v ekonomski literaturi že dolgo zgodovino, v Evropi pa se je raziskovanje osredotočalo predvsem na analizo šokov in pomen instituciji trga dela ter njuno so-vplivanje. Tako je na primer že Giersch (1985) trdil, da so evropske države postale preveč rigidne za spopadanje z močnimi šoki. Pri tem je opozoril predvsem na rigidnost v plačah, ki naj bi bila največji problem za vzpostavitev ravnotežja na med plačami in zaposlenostjo. V nadaljevanju je Barro (1988) omenjal ostale institucionalne rigidnosti, ki bi lahko pojasnjevale vztrajno in povečano stopnjo brezposelnosti. Med tovrstne togosti na primer lahko sodita tudi visoka vključenost v sindikalne oblike in zakonodaja, ki močno ščiti zaposlene. Na drugi strani pa je Bertola (1990) trdil, da visoka zaščita delavcev ne more sama pojasniti visoke brezposelnosti v evropskih državah. Tako sta Blanchard in Wolfers (2000) ugotovila, da je za razumevanje zaposlovanja in odpuščanja po letu 1960 ključna predvsem prepletenost med šoki in institucijami.[32]

Nadalje so številni avtorji opozarjali na bolj granularne vidike trga dela, med drugim na sestavo zaposlenih. Slednje je na primer dosledno s t. i. teorijo notranji-zunanji (angl. insider-outsider), ki sta jo razvila Lindbeck in Snower (1984, 1988). Slednja skuša pojasniti razlike v plačah in zaposlitvenih možnostih med tistimi, ki so že zaposleni (insiders), ter tistimi, ki na trg dela šele vstopajo (outsiders). Po tej teoriji že zaposleni uživajo več pravic in ugodnosti na trgu dela, saj imajo običajno več spretnosti, pravo izobrazbo za delovno mesto in dostop do primernega izpopolnjevanja ali preprosto več manevrskega prostora za pogajanja kot tisti, ki v trg dela še niso vključeni.

Ker podatki WDN združujejo nekatere zgoraj omenjene elemente, lahko znotraj enega modela testiram pomen različnih značilnosti, ki so ključne za zaposlitvene odločitve podjetij. Struktura

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[32] Tudi Galuscak in drugi (2012), Bertola in drugi (2012), Fabiani in drugi (2015), Boeri in Jimeno (2016), ki so uporabljali sorodne podatke WDN, ugotavljajo, da so razlike v delovanju trga dela v Evropi v veliki meri tudi posledica drugačnih institucij na trgu dela.

vprašalnika nadalje omogoča, da ugotovim relativno pomembnost posameznih faktorjev pri zaposlovanju, ki jih kasneje pojasnjujem s šoki, institucijami in ostalimi spremenljivkami na ravni podjetja. Pri tem pa je potrebno poudariti, da bi bilo za popolno vključenost značilnosti na ravni podjetja potrebno pridobiti na primer tudi bilančne podatke podjetij, kar v tem primeru ni mogoče.

Glede relativne pomembnosti deležnikov pri zaposlovanju ugotavljam, da je negotovost v zvezi s stanjem v gospodarstvu ob koncu recesij najpomembnejša ovira pri zaposlovanju. V povprečju 62 % podjetij poroča, da visoka negotovost igra pomembno vlogo pri odločitvah glede zaposlovanja. Nadalje raziskava kaže, da med državami obstajajo pomembne razlike. Le 26 % podjetij v Avstriji poroča o tej omejitvi, medtem ko je v Franciji takšnih podjetij kar 91 %. Na drugem mestu po pomembnosti je pomanjkanje usposobljenih delavcev, povprečje na ravni EU pa znaša 57 %. Tudi v tem primeru prihaja do pomembnih razlik med državami. Po vrstnem redu si sledijo naslednji faktorji: visoki davki na plače (55 % na ravni EU), visoke plače (46 % na ravni EU), visoki stroški odpuščanja (41 % na ravni EU) ter negotovosti glede sprememb zakonov na trgu dela (40 % na ravni EU). Med manj pomembne omejitve pa sodijo omejena dostopnost do financiranja (24 % na ravni EU), visoki stroški ostalih vhodnih komponent (29 % na ravni EU) in visoki stroški zaposlovanja (30 % na ravni EU). Tudi na splošno velja opozoriti na pomembne razlike med ovirami med posameznimi državami in glede na velikost podjetja, medtem ko sektorsko gledano ne prihaja do pomembnih razlik. Na primer podjetja, ki prihajajo iz držav, ki jih je kriza močno prizadela, in podjetja iz baltskih ter vzhodnoevropskih držav v povprečju večkrat poročajo o omejitvah. Pri omejitvi dostopnosti do financiranja na primer kar 60 % latvijskih podjetij poroča o omejitvah, medtem ko je teh v Avstriji le 5 %. V povprečju pa se kaže, da imajo manjša podjetja več težav pri zaposlovanju, kot večja podjetja. Slednje je toliko bolj značilno tudi za majhna podjetja, ki imajo v primerjavi z večjimi manj manevrskega prostora pri na primer razporejanju delavcev na delovna mesta ali uvedbi izmenskega dela.

Glede značilnosti, ki vplivajo na zaposlovanje, ugotavljam sledeče. Prvič, negativni finančni in povpraševali šoki v veliki večini primerov povečujejo verjetnost, da podjetja poročajo o omejitvah pri zaposlovanju, kar je skladno s teorijo povpraševanja po delovni sili. Pričakuje se namreč, da bodo podjetja, ki so bila podvržena šokom odpuščala ali pa uporabljala druge kanale za zmanjševanje stroškov dela. Prav tako katera koli oblika plačnih dogovorov povečuje verjetnost, da podjetje poroča o katerem koli omejitvenem faktorju pri zaposlovanju. V tem primeru mora namreč podjetje že upoštevati večje število dejavnikov, kar mu pušča manj prostora za prilagoditve v primeru šokov.

Drugič, tudi ko v regresijah že vključim šoke, sektorje in države, ostanejo številne spremenljivke na ravni podjetja statistično značilne. V primeru, da podjetje zaposluje izkušene, usposobljene ter za nedoločen čas zaposlene delavce, so ovire pri zaposlovanju praviloma manjše, kar lahko kaže na to, da takšne značilnosti delavcev po navadi odražajo večjo dojemljivost za stanje v podjetju ter zato večjo prilagodljivost v primeru sprememb.

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Kljub temu pa omenjenih dejavnikov ne gre posploševati na vse faktorje zaposlovanja. Tako so na primer pri problemu pridobivanja usposobljenih delavcev rezultati včasih ravno nasprotni. Vztrajni, negativni šoki na strani povpraševanja zmanjšujejo verjetnost, da bi podjetja poročala o tej omejitvi, kar kaže na to, da je v bolj persistentnih krizah bazen, iz katerega lahko podjetja črpajo kader, večji. V tem primeru imajo probleme pri vstopu na trg dela tudi bolj izobraženi, kar v času konjunkture ni tako izrazito. Nadalje analiza kaže, da imajo podjetja, ki zaposlujejo usposobljeno in kvalificirano delovno silo, v tem primeru v povprečju več težav pri zaposlovanju. Tovrstni delavci namreč lahko posedujejo več človeškega kapitala, ki se nanaša na specifično podjetje, kar seveda prinaša tudi večjo pogajalsko moč. Na drugi strani pa je takšna sestava podjetja tudi odraz, da podjetje išče visokokvalificirane kadre, ki jih je na trgu dela veliko težje najti. Kakorkoli, verjetno je glavna ugotovitev tega dela ravno v tem, da ne obstajajo univerzalne značilnosti, ki bi vse faktorje pojasnile na enak način.

Iz analize torej sledi, da so značilnosti na ravni podjetja izrednega pomena za pojasnjevanje ovir pri zaposlovanju. Z njimi lahko izboljšam uporabno vrednost ekonomskega modela, saj omogoča dodaten vpogled, ki ga z makro podatki ni mogoče zajeti, kar pomeni, da bi morale biti takšne spremenljivke, če so le dostopne, prisotne v modelih.

Verjetno je največja pomanjkljivost analize v tem, da v moji raziskavi ni mogoče popolnoma nadzirati problema pristranskosti zaradi endogenosti, saj instrumentalne spremenljivke niso na voljo. Prav tako zaradi narave vprašalnika, ki odraža presek stanja v obdobju po krizi, ne morem nadzorovati sprememb, ki bi jih sicer lahko z daljšo časovno vrsto. Nadalje pa uporabljeni podatki žal ne morejo biti združeni z bilančnimi podatki podjetij, kar bi dodatno razširilo analizo in jo naredilo manj subjektivno. Slednje bi bilo potrebno upoštevati pri nadaljnjih anketah WDN. Na koncu pa je potrebno poudariti da lahko na zaposlovanje vplivajo tudi številni drugi dejavniki, kot sta socialna in pokojninska politika, in druge institucije na trgu dela, ki pa znotraj vprašalnika WDN niso na voljo.

5. Ali nova anketa WDN potrjuje, da so reforme trga dela v EU prispevale k večjemu zaposlovanju?

To vprašanje ostaja analizi navkljub v nekaterih pogledih neodgovorjeno. Vprašanje glede učinkov strukturnih reform je bilo namreč v vprašalniku WDN zajeto le v nekaterih državah, kar seveda zmanjšuje zmožnosti posploševanja rezultatov na celotno raven EU. Nadalje, obsežne reforme na trgu dela so bile v obdobju analize izvedene le v nekaterih državah EU. Tretjič, kot ugotavljam že pri pregledu strokovne literature, se učinki reform kažejo večinoma na srednji oziroma dolgi rok, zato ni pričakovati, da bi se izredno močni učinki reform pokazali že v prvih nekaj letih po implementaciji. Četrtič, obdobje strukturnih reform le deloma sovpada z obdobjem analize WDN. Tako je na primer Italija izvedla reformo trga dela po tem, ko je bil vprašalnik WDN praktično že zaključen.

Če vzamem zgornje pomisleke v zakup, rezultati opisne in empirične analize kažejo, da imajo strukturne reforme na trgu dela, izvedene v letih med 2010 in 2013, pomemben vpliv na

odpravljanje problemov pri zaposlovanju. Če so podjetja v anketi menila, da se je prožnost na trgu dela povečala pod vplivom reform, se je verjetnost, da je podjetje poročalo o ovirah pri zaposlovanju, statistično značilno zmanjšala. Slednje velja tako za ovire, ki so povezane s previsokimi stroški zaposlovanja in odpuščanja delavcev, kot tudi za probleme (pre)visokih plač v podjetju. Analiza torej kaže, da imajo reforme potencial za zmanjšanje ovir pri zaposlovanju v EU, kljub temu pa so potrebni dodatni napori za povezovanje bolj mikro in makro študij glede trga dela, saj kavzalnost v večini analiz še ni popolnoma enoznačna.

Prispevek k znanosti

Prvo poglavje je opisne narave, saj prikaže najpomembnejša dognanja glede učinkov reform in institucij na področju trga dela prek študije literature. Tako je treba doktorsko disertacijo pri prispevku k znanosti ovrednoti predvsem prek dveh empiričnih poglavij, ki sledita. Pri teh se lahko prispevek ovrednoti prek metodološkega prispevka in prispevka k napotkom ekonomski politiki. V naslednjih razdelkih se najprej posvetim metodološkemu prispevku.

Prvo empirično delo uporablja nove metode, t. i. metode lokalne projekcije. Ta je izrazito primerna za analizo učinkov finančnih šokov, ki se razlikujejo glede na prožnost institucij trga dela. V literaturi se namreč za empirično analizo transmisije šokov v večini primerov uporablja vektorska avtoregresija (VAR), metoda lokalne projekcije, ki jo uporabim v analizi, pa ima glede na slednjo nekatere pomembne prednosti. Med njimi je verjetno najpomembnejša ta, da je metoda lokalne projekcije manj občutljiva za morebitno napačno specifikacijo modela. Vsako obdobje je namreč ocenjeno posebej in ne rekurzivno, kot je to značilno za modele VAR, pri katerih se napake zaradi rekurzivnosti skozi čas kopičijo. Nadalje metoda že v osnovi omogoča tudi razlikovanje med pozitivnimi in negativnimi finančnimi šoki in posledično preučevanje asimetričnosti, česar standardni model VAR zaradi linearnosti ne omogoča. Prav tako je znotraj metode lokalne projekcije zelo preprosto uresničiti panelno strukturo podatkov z interakcijo med spremenljivkami, kar je še posebno prikladno v mojem primeru, ko analiziram prepletenost finančnih šokov in institucij trga dela.

Nadalje je z vidika metodologije prednost moje analize tudi v tem, da se zanaša na manj agregirane, torej sektorsko specifične podatke, medtem ko so bile doslej podobne raziskave narejene na bolj agregiranih podatkih, največkrat na ravni držav. Moji podatki tako omogočajo, da lažje nadziram nekatere učinke (npr. učinki, stalni v času, med sektorji itd.), razlikujem med javnim in zasebnim sektorjem ter nadzorujem sestavo delovne sile, česar v agregatni analizi ni mogoče storiti.

Glede napotkov ekonomski politiki v analizi v veliki meri potrdim in razširim obstoječe najdbe. Tako na primer potrdim, da so opravljene delovne ure v EU manj pomembne od drugih dveh kanalov prilagajanja, pri čemer pa so ob negativnem finančnem šoku prizadeti vsi trije kanali. Prav tako z novejšo metodologijo potrdim asimetričnost finančnih šokov, ki so močnejši v času recesij. Analiza pa prinaša tudi nekatere novosti glede na obstoječo literaturo. Tako na primer

pokažem, da institucije trga dela vplivajo predvsem na relativno pomembnost posameznih prilagoditvenih marž, medtem ko so raziskave prej omenjale predvsem njihov absolutni pomen pri dinamiki na trgu dela. Slednje pomeni, da se podjetja prilagajajo znotraj nabora institucij bolj, kot je bilo prej pokazano. Hkrati pa moja dognanja kažejo, da morajo obstajati tudi drugi razlogi, ki lahko pojasnijo transmisijo finančnih šokov, kar pa presega domet doktorske disertacije.

Drugo empirično poglavje prinaša naslednji prispevek k znanosti. Ker uporabljeni podatki niso javno dostopni, gre v primeru analize za prvo raziskavo na osnovi omenjenih podatkov. Prav tako organizacija podatkov omogoča naenkrat vpogled v številne faktorje pri zaposlovanju, medtem ko se je ekonomska znanost doslej večinoma ukvarjala z vsakim posebej. Prav zaradi tega lahko ovrednotim tudi njihovo relativno pomembnost. Nadalje podatki omogočajo razlikovanje med šoki, značilnostmi podjetij in zaposlenih na ravni podjetja ter institucijami trga dela, kar omogoča širši vpogled v dinamiko trga dela po krizi. Prav zaradi tega pokažem, da so za razumevanje dinamike trga dela pomembne tudi druge značilnosti na ravni podjetja. To je predvsem struktura zaposlenih, ki je bila sicer večinoma analizirana v okviru drugačnih teorij trga dela. Ne nazadnje pa analiza na osnovi novih podatkov pokaže tudi, da strukturne reforme lahko pomagajo odpraviti nekatere ovire pri zaposlovanju. Ugotovitve pa je seveda potrebno razumeti v okviru vprašalnika, ki je zelo specifične narave in zato je popolna posplošitev ugotovitev na makroekonomsko raven izredno zahtevna, če ne že nemogoča.

Implikacije

Že prvo poglavje predstavi številne implikacije. Prvič, z razvojem novih orodij in podatkovnih baz so postali preučevalci in snovalci ekonomske politike bolj samozavestni glede učinkov strukturnih reform. Drugič, pri empiričnem vrednotenju učinkov reform je kljub temu še vedno težko govoriti o vzročnosti povezav med reformami in njihovimi učinki na gospodarstvo. Zaradi sovplivanja številnih dejavnikov je namreč izredno težko osamiti učinke reform. Tretjič, kratkoročni učinki reform so težko merljivi, saj reforme vplivajo predvsem na dolgoročno uravnoteženo stanje (angl. long-run steady state) gospodarstva. Prav zaradi tega je tolmačenje kratkoročnih učinkov reform lahko problematično in mora biti narejeno z veliko mero previdnosti. Verjetno pa je najtežje odgovoriti na vprašanje, kako spodbuditi implementacijo reform in izboljšati institucije, da bi spodbujale reforme tudi v času gospodarske konjunkture, ko je čas zanje najprimernejši. Združevanje številnih reform in spodbujevalno naravnana fiskalna in denarna politika v času kriz načeloma delujeta kot pomembna spodbujevalna dejavnika, kljub temu pa se prvo poglavje zaključi z ugotovitvijo, da številni dejavniki in učinki strukturnih reform ostajajo neznani in jih je treba dodatno raziskati.

Tudi zaradi tega se v naslednjih dveh poglavjih lotim empirične analize. V poglavju, kjer analiziram vpliv finančnih šokov na trg dela ob prisotnosti manj oziroma bolj prožnih institucij na trgu dela, ugotavljam, da prihaja do pomembnih razlik pri intenzivnosti šokov na posamezne meje prilagajanja. To načeloma pomeni, da lahko podjetja izbirajo med tem, ali bodo v času

recesije raje odpustila delavce, zmanjšala število opravljenih ur ali pa znižala plače. Vendar že pri upoštevanju asimetričnosti šokov pokažem, da različne meje kažejo drugačne odzive pri pozitivnih oziroma negativnih finančnih šokih, kar morajo podjetja in tudi snovalci ekonomske politike upoštevati, ko se odzovejo na krizo. Analiza postane še kompleksnejša, ko vanjo vključim še institucije trga dela. S tem na primer pokažem, da lahko določena institucija preprečuje upad zaposlenosti v času krize, vendar hkrati preprečuje zaposlovanje v času konjunkture. Tako še enkrat opozorim na potrebo po previdnosti pri spreminjanju institucij trga dela. Če so reforme pravilno implementirane, lahko pomagajo pri večji prožnosti in posledično pri večjem zaposlovanju v času konjunkture, hkrati pa zmanjšujejo odzivni čas podjetja v času krize. Na drugi strani pa so lahko (če je njihova implementacija napačna) tudi vzrok za večje odpuščanje v času, ko je to najmanj potrebno in zaželeno.

Nadalje pokažem, da institucije vplivajo predvsem na relativna razmerja med posameznimi prilagoditvenimi maržami, niso pa posebej pomembne za celotno, agregatno odzivnost plač. To me vodi do ugotovitve, da poleg institucij in šokov obstajajo tudi drugi dejavniki, ki vplivajo na transmisijo šokov na trgu dela, ti pa v analizo niso vključeni. To me vrača na začetno ugotovitev, da številni dejavniki, ki vplivajo na trg dela v času gospodarskih kriz, ostajajo nepojasnjeni.

V drugem empiričnem poglavju analiziram ključne faktorje pri zaposlovanju v EU po krizi z vidika vprašalnika na ravni podjetja. Pokažem, da sta visoka negotovost in pomanjkanje usposobljene delovne sile ključna razloga za manjše zaposlovanje za nedoločen čas ob koncu recesij. Slednje vodi do spoznanja, da mora ekonomska politika delovati v smeri zmanjševanja negotovosti in voditi transparentno in jasno zaposlitveno politiko, hkrati pa poudarja pomen učinkovitega izobraževalnega sistema tako v formalnem kot tudi neformalnem smislu. Pri vključevanju značilnosti na ravni podjetja v analizo pokažem, da so te izrednega pomena pri pojasnjevanju dejavnikov zaposlovanja, zato ne smejo biti spregledane. Analiza ekonomske literature ter tudi implementacija reform pa nasprotno te največkrat zaobideta. Na koncu pa analiza pokaže, da so imele reforme trga dela pomembno vlogo pri povečevanju prožnosti trga dela, vendar pa je o močnih učinkih (vsaj iz te analize) prerano soditi. Naj še enkrat poudarim, da gre za anketne podatke, ki se nanašajo na specifično obdobje. Prav zaradi tega je posploševanje ugotovitev v smislu dinamične teorije povpraševanja na trgu dela oteženo, če ne že nemogoče.

Na koncu bi se pravzaprav rad vrnil k začetnim ugotovitvam iz pregleda literature. Tam pokažem, da so z razvojem novih metod in baz podatkov raziskovalci in snovalci ekonomske politike postali bolj prepričani o učinkih reform ter tudi o tem, kako reforme pravilno vključiti v modele. Še enkrat bi namreč rad poudaril, da je kljub vsem naporom tudi danes še vedno težko neposredno povezati reforme z njihovimi učinki v smislu vzročnosti, vendar to ne pomeni, da je treba odnehati. Pomeni le, da je treba biti previden pri izbiri metod in vprašanja, ki ga rešujemo. Le če nam bo uspelo najti pravo kombinacijo, lahko prispevamo k širšemu razumevanju reform, institucij ter njihovih učinkov.

Nadalje spoznanja iz literature nakazujejo, da lahko pravilno implementirane reforme pomembno izboljšajo delovanje gospodarstva, vendar je treba tudi tukaj dodati, da reforme niso čarobna palica, ki bi hitro rešila vse probleme držav. Ugotovitve namreč kažejo, da sta prepletenost in pravilno sovplivanje vseh treh politik (strukturne, fiskalne in monetarne) ključnega pomena za doseganje večje zaposlenosti in rasti. Iskanje prave mere ekonomskih politik ob pravem času pa bo verjetno še precej časa zaposlovalo raziskovalce v ekonomiji. Naj zaključim, da upam, da sem vsaj na nekaterih mestih dodal svoj kamenček v mozaik ekonomske znanosti.

Appendix 2: Additional results from chapter 2 and 3

Table B1: Descriptive statistics

		Employment			Hours worked			Real wages		
		Mean	*Std Dev*	*N*	*Mean*	*Std Dev*	*N*	*Mean*	*Std Dev*	*N*
AT	Manufacturing	-0.2	1.7	62	-0.3	1.6	59	1.2	1.9	59
	Construction	0.2	2.1	62	-0.3	1.6	59	0.1	2.4	59
	Services	1.6	1.0	62	-0.6	0.7	59	0.9	1.3	59
	Public sector	1.5	0.6	62	-0.6	1.2	59	0.5	1.9	59
BE	Manufacturing	-1.5	2.0	53						
	Construction	0.6	2.0	68						
	Services	1.3	1.0	68						
	Public sector	1.7	0.5	68						
CY	Manufacturing	-3.3	2.8	20	-0.7	0.8	20	2.6	6.9	20
	Construction	-4.1	7.1	20	-1.3	1.3	20	0.4	7.5	20
	Services	0.3	1.9	20	0.6	1.2	20	0.4	2.5	20
	Public sector	1.6	1.4	20	-0.1	1.9	20	0.1	4.7	20
ES	Manufacturing	-1.1	4.3	60	0.3	1.6	60	0.9	2.5	60
	Construction	-0.3	11.5	60	0.4	2.0	60	0.5	4.6	60
	Services	3.2	3.2	60	-0.4	1.4	60	0.8	2.2	60
	Public sector	2.5	1.2	60	-0.1	2.0	60	0.6	3.2	60
FI	Manufacturing	-1.3	3.7	68	-0.3	2.5	68	1.5	4.0	68
	Construction	1.4	3.8	68	-0.4	2.9	68	1.4	3.5	68
	Services	1.5	2.0	68	-0.3	1.9	68	1.5	2.4	68
	Public sector	0.9	1.0	68	-0.1	2.2	68	1.3	2.4	68
FR	Manufacturing	-1.6	1.5	68	-0.5	1.4	68	1.3	1.6	68
	Construction	1.4	2.2	68	-0.5	1.3	68	1.0	2.0	68
	Services	1.3	1.5	68	-0.4	1.2	68	1.1	1.8	68
	Public sector	0.7	0.4	68	-0.4	1.5	68	1.0	2.0	68
GR	Manufacturing	0.6	2.9	36	-0.9	2.6	36	1.3	6.1	36
	Construction	2.5	4.2	36	-0.4	2.5	36	2.3	6.3	36
	Services	1.8	1.5	36	-0.2	1.3	36	2.5	4.1	36
	Public sector	2.1	3.6	36	-0.5	2.2	36	3.5	7.8	36
IE	Manufacturing	-1.7	4.0	56	-0.4	2.0	56	2.5	4.2	56
	Construction	1.3	16.7	56	-0.5	2.1	56	1.7	5.1	56
	Services	2.6	3.6	56	-0.5	0.8	56	2.2	3.6	56
	Public sector	4.2	2.2	56	-0.3	1.0	56	0.9	3.7	56
IT	Manufacturing	-0.9	1.8	59	-0.9	2.4	59	1.2	1.3	59
	Construction	0.3	4.5	62	-0.1	2.3	62	0.0	2.7	62
	Services	1.3	1.8	61	-0.5	1.0	61	0.6	1.7	61
	Public sector	0.1	0.8	61	-0.2	1.0	61	0.4	3.5	61
LU	Manufacturing	-0.3	2.0	60	-0.2	2.2	60	0.0	3.2	60
	Construction	2.5	1.9	60	-0.3	2.0	60	0.6	3.7	60
	Services	3.2	1.9	60	-0.4	0.6	60	0.6	1.8	60
	Public sector	4.2	1.0	60	-0.6	1.0	60	0.7	2.0	60
MT	Manufacturing	-1.3	3.9	32	-1.2	1.6	32	1.2	8.4	32
	Construction	2.1	2.6	32	-1.4	2.2	32	1.7	5.1	32
	Services	3.5	1.9	32						
	Public sector	3.6	2.3	32	-1.8	1.2	13	2.8	1.8	13

		Employment			Hours worked			Real wages		
		Mean	*Std Dev*	*N*	*Mean*	*Std Dev*	*N*	*Mean*	*Std Dev*	*N*
NL	Manufacturing	-1.3	1.4	65	0.0	1.1	61	0.6	1.5	61
	Construction	-0.9	2.9	65	0.3	1.9	61	-0.2	2.6	61
	Services	0.7	2.1	65	-0.2	1.0	61	0.6	2.1	61
	Public sector	1.5	1.7	65	-0.3	1.0	61	0.6	1.7	61
PT	Manufacturing	-2.5	3.0	52	0.5	1.7	48	0.7	2.2	48
	Construction	-0.9	5.5	52	-0.3	2.5	48	2.6	3.3	48
	Services	1.6	1.8	52	-0.3	1.4	48	1.0	2.3	48
	Public sector	1.2	1.7	52	0.2	1.6	48	0.0	3.6	48
SI	Manufacturing	-2.0	3.9	36	0.1	2.8	36	1.5	2.7	36
	Construction	-1.7	8.6	36	0.2	3.4	36	-0.2	4.7	36
	Services	1.0	2.4	36	0.2	2.5	36	-0.7	3.4	36
	Public sector	1.1	0.9	36	0.4	2.5	36	-1.3	4.4	36
SK	Manufacturing	-1.4	5.5	28	-0.2	2.5	28	2.4	1.9	28
	Construction	-1.6	2.8	28	-0.6	2.3	28	0.4	5.2	28
	Services	1.2	1.8	28	-0.4	1.2	28	1.1	2.9	28
	Public sector	0.4	1.0	28	-0.2	1.4	28	2.2	4.7	28
Total		0.7	4.2	3,072	-0.3	1.8	2,720	1.0	3.5	2,720

Note: Excludes programme observations.

Source: Hantzsche, Savšek and Weber (2018).

Figure B1: Baseline compared to full sample including programme period observations
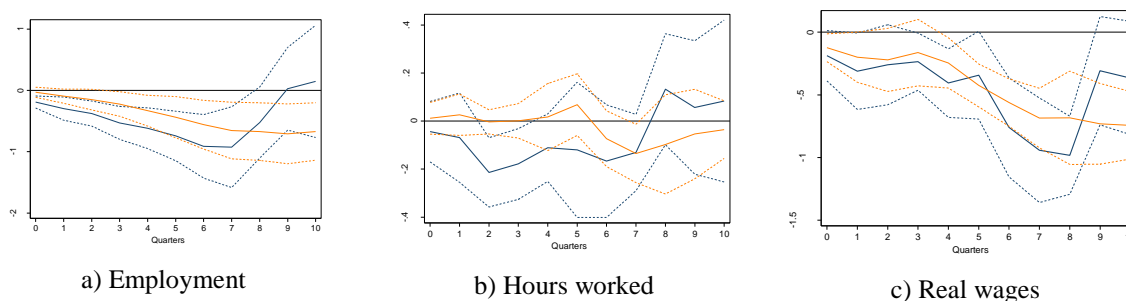
a) Employment

b) Hours worked

c) Real wages

Note: Baseline specification blue (dark) line; alternative specification orange (light) line. Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors. Spread shock.

Source: Hantzsche, Savšek and Weber (2018).

Table B2: Baseline regression results

Dependent variable:	I Employment h=0	II Employment h=4	III Employment h=8	IV Hours worked h=0	V Hours worked h=4	VI Hours worked h=8	VII Real wages h=0	VIII Real wages h=4	IX Real wages h=8
Spread	-0.003***	-0.011***	-0.009	-0.001	-0.002	0.002	-0.003	-0.007**	-0.018***
	[0.00]	[0.00]	[0.01]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Lag 1 dependent variable	0.148**	0.789***	0.542**	-0.579***	-0.634***	-0.761***	-0.486***	-0.617***	-0.751***
	[0.07]	[0.22]	[0.26]	[0.04]	[0.03]	[0.05]	[0.03]	[0.05]	[0.04]
Lag 2 dependent variable	0.210***	0.736***	0.508*	-0.479***	-0.469***	-0.554***	-0.309***	-0.370***	-0.462***
	[0.03]	[0.11]	[0.26]	[0.03]	[0.04]	[0.05]	[0.03]	[0.05]	[0.05]
Lag 3 dependent variable	0.184***	0.391***	0.106	-0.343***	-0.310***	-0.342***	-0.212***	-0.198***	-0.336***
	[0.04]	[0.12]	[0.32]	[0.02]	[0.04]	[0.05]	[0.03]	[0.04]	[0.05]
Lag 4 dependent variable	-0.033	-0.029	-0.554**	0.029	-0.100**	-0.162***	0.052	-0.044	-0.118**
	[0.04]	[0.18]	[0.27]	[0.04]	[0.04]	[0.06]	[0.04]	[0.05]	[0.06]
GVA growth	0.044***	0.181***	0.203***	0.044***	0.040***	0.023*	0.003	0.013	0.015
	[0.01]	[0.03]	[0.05]	[0.01]	[0.01]	[0.01]	[0.02]	[0.02]	[0.02]
GVA deflator	0.075***	0.178	0.094	-0.053	-0.055	-0.009	0.143**	0.110	0.032
	[0.02]	[0.11]	[0.16]	[0.05]	[0.05]	[0.06]	[0.07]	[0.09]	[0.07]
Share temporary work	0.001***	-0.001	-0.002	-0.000	-0.000	-0.001	0.000	0.001	0.003**
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Share part-time work	0.000	0.004	0.004	-0.000	0.000	0.000	0.001*	0.001	0.002*
	[0.00]	[0.00]	[0.01]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Country-sector fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country-sector trends	yes	yes	yes	yes	yes	yes	yes	yes	yes
Time fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	2,851	2,730	2,567	2,547	2,434	2,282	2,547	2,430	2,278
Country-sectors	59	59	59	54	54	54	54	54	54
R-squared	0.376	0.540	0.627	0.432	0.350	0.429	0.422	0.407	0.574

Note: *Driscoll-Kraay standard errors in brackets. Significance given by *** p<0.01, ** p<0.05, * p<0.1.*
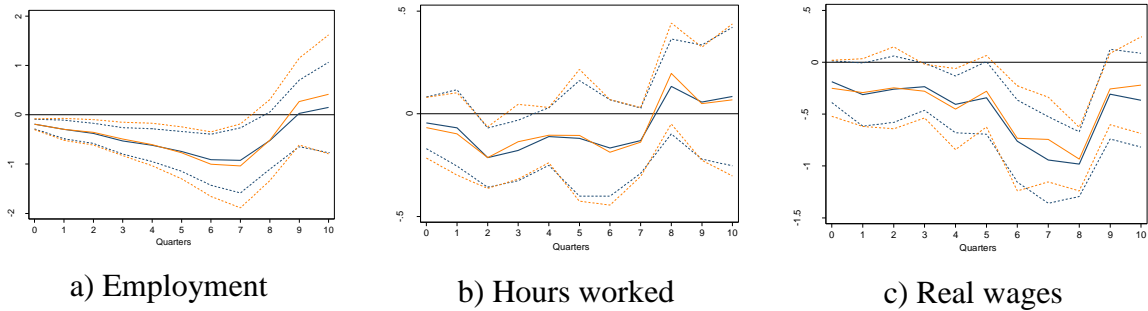
Source: Hantzsche, Savšek and Weber (2018).

Table B3: Baseline regression results (loan shock)

Dependent variable:	I Employment h=0	II Employment h=4	III Employment h=8	IV Hours worked h=0	V Hours worked h=4	VI Hours worked h=8	VII Real wages h=0	VIII Real wages h=4	IX Real wages h=8
Spread	-0.014	-0.305***	-0.615***	0.058*	0.039	0.135**	-0.029	-0.147*	-0.143
	[0.02]	[0.10]	[0.14]	[0.03]	[0.04]	[0.06]	[0.06]	[0.08]	[0.10]
Lag 1 dependent variable	0.042***	0.181***	0.196***	0.045***	0.040***	0.023*	0.001	0.012	0.014
	[0.01]	[0.03]	[0.05]	[0.01]	[0.01]	[0.01]	[0.02]	[0.02]	[0.02]
Lag 2 dependent variable	0.120***	0.284**	0.193	-0.043	-0.057	-0.009	0.150**	0.129	0.083
	[0.03]	[0.12]	[0.18]	[0.05]	[0.05]	[0.06]	[0.07]	[0.09]	[0.07]
Lag 3 dependent variable	0.148**	0.744***	0.469*	-0.581***	-0.628***	-0.764***	-0.487***	-0.629***	-0.760***
	[0.07]	[0.22]	[0.28]	[0.04]	[0.03]	[0.05]	[0.03]	[0.05]	[0.04]
Lag 4 dependent variable	0.148**	0.674***	0.401	-0.480***	-0.467***	-0.561***	-0.313***	-0.391***	-0.492***
	[0.06]	[0.12]	[0.26]	[0.03]	[0.04]	[0.05]	[0.03]	[0.04]	[0.06]
GVA growth	0.187***	0.437***	0.162	-0.356***	-0.305***	-0.352***	-0.225***	-0.218***	-0.367***
	[0.04]	[0.13]	[0.32]	[0.03]	[0.04]	[0.05]	[0.03]	[0.04]	[0.05]
GVA deflator	0.042	0.035	-0.443	0.024	-0.099**	-0.162***	0.055	-0.044	-0.119**
	[0.06]	[0.17]	[0.27]	[0.04]	[0.04]	[0.06]	[0.04]	[0.05]	[0.06]
Share temporary work	0.001***	-0.001	-0.002	-0.000	-0.000	-0.001	0.000	0.001	0.002*
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Share part-time work	0.000	0.004	0.005	-0.000	0.000	0.000	0.001**	0.001**	0.002**
	[0.00]	[0.00]	[0.01]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Country-sector fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country-sector trends	yes	yes	yes	yes	yes	yes	yes	yes	yes
Time fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	2,806	2,660	2,497	2,506	2,372	2,220	2,506	2,368	2,216
Country-sectors	59	59	59	54	54	54	54	54	54
R-squared	0.346	0.528	0.622	0.430	0.343	0.427	0.305	0.419	0.579

Note: *Driscoll-Kraay standard errors in brackets. Significance given by *** p<0.01, ** p<0.05, * p<0.1.*

Source: Hantzsche, Savšek and Weber (2018).

Figure B2: Baseline compared to sample excluding public sector

a) Employment b) Hours worked c) Real wages

Note: Baseline specification blue (dark) line; alternative specification orange (light) line. Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors. Spread shock.
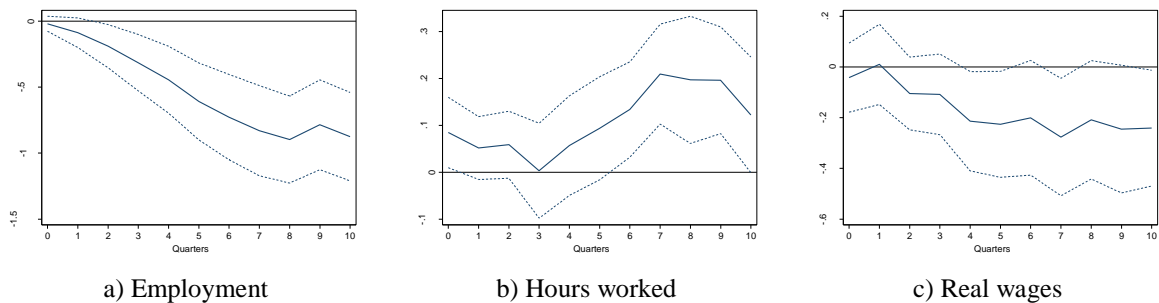*Source: Hantzsche, Savšek and Weber (2018).*

Figure B3: Loan shock measure
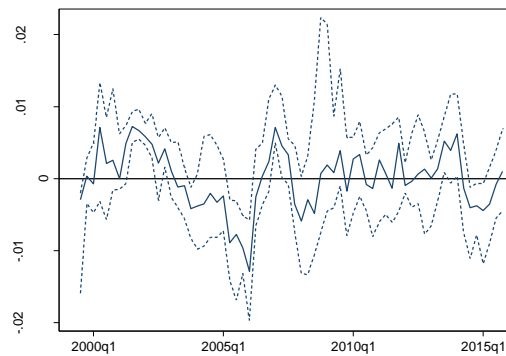
Note: Quarterly change in percentage points, excluding programme period observations. Solid line depicts median across countries. Dashed lines depict interquartile range across countries. Loan shocks are measured using the residual from a regression of real annual loan growth on its quarterly lag and GDP growth, multiplied by -1. Source: Hantzsche, Savšek and Weber (2018).
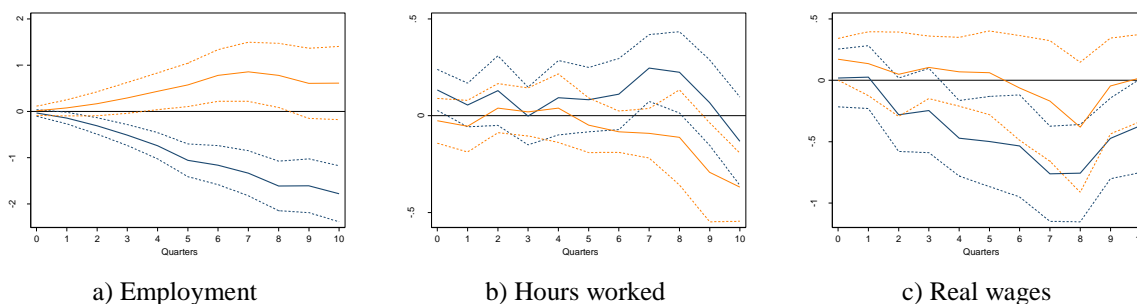
Figure B4: Baseline results (loan shock)

a) Employment b) Hours worked c) Real wages

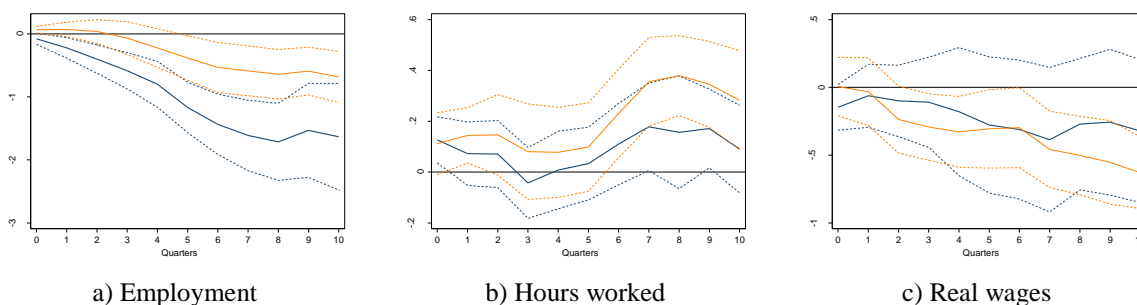*Note: Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors.*
Source: Hantzsche, Savšek and Weber (2018).

Figure B5: Tightening and easing loan shocks

| a) Employment | b) Hours worked | c) Real wages |

Note: *Tightening (positive) loan shock blue (dark) line; easing (negative) loan shock orange (light) line. Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors.*
Source: Hantzsche, Savšek and Weber (2018).

Figure B6: Results for high and low EPL (loan shock)

| a) Employment | b) Hours worked | c) Real wages |

Note: *Low rigidity blue (dark) line (20th percentile of sample EPL); high rigidity orange (light) line (80th percentile of sample EPL). Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors. Source: Hantzsche, Savšek and Weber (2018).*

Figure B7: Results for high and low union density (loan shock)
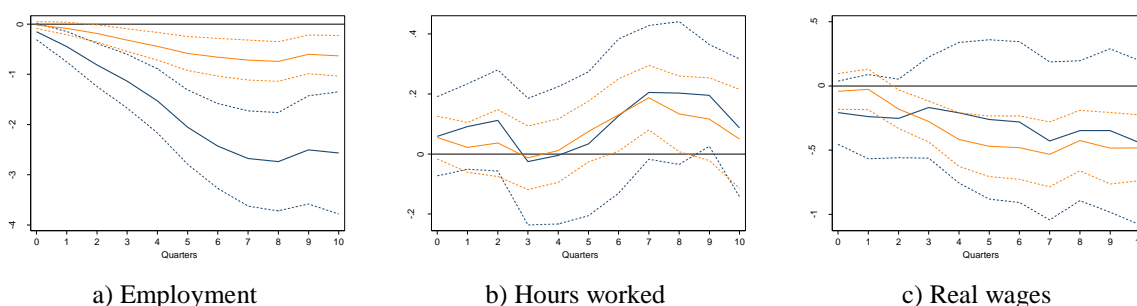
| a) Employment | b) Hours worked | c) Real wages |

Note: *Low rigidity blue (dark) line (20th percentile of sample union density); high rigidity orange (light) line (80th percentile of sample union density). Dashed lines 90% confidence interval calculated with Driscoll-Kraay standard errors. Source: Hantzsche, Savšek and Weber (2018).*

Table B4: Factors/obstacles to hiring, % of firms that answered relevant/very relevant to a particular factor, cross-sectoral results

Sector	Uncertain economic conditions	Shortage of skilled labour	Limited access to finance	High firing costs	High hiring costs	High payroll taxes	High wages	Risks of labour law changes	High cost of other inputs
Manufacturing	65	57	23	42	28	56	45	40	30
Electricity, gas	53	56	35	35	35	49	42	41	30
Construction	69	66	34	46	30	65	51	46	36
Trade	64	57	25	42	33	58	44	41	32
Business services	60	57	23	40	30	53	47	40	28
Financial intermediation	40	43	12	19	23	29	38	23	14
TOTAL	**62**	**57**	**24**	**41**	**30**	**55**	**46**	**40**	**29**

Notes: employment-weighted figures, which are used to reflect better overall employment.
Source: Savšek (2018; adapted from WDN3 - author's calculations).

Table B5: Factors/obstacles to hiring, % of firms that answered relevant/very relevant to a particular factor, firm-size results

Firm size	Uncertain economic conditions	Shortage of skilled labour	Limited access to finance	High firing costs	High hiring costs	High payroll taxes	High wages	Risks of labour law changes	High cost of other inputs
1-5 employees	70	57	34	46	34	65	54	48	35
20-49 employees	64	60	27	43	32	60	47	42	32
50-199 employees	66	62	23	43	31	60	48	45	31
200+ employees	56	53	20	37	27	47	41	35	26
TOTAL	**62**	**57**	**24**	**41**	**30**	**55**	**46**	**40**	**29**

Notes: employment-weighted figures, which are used to reflect better overall employment
Source: Savšek (2018; adapted from WDN3 - author's calculations).

Table B6: Probit regressions, including 2010-13 permanent employment evolution dummy variable to the baseline

Explanatory variables	Factors/obstacles								
	Risks of labour laws being changed	Insufficient access to finance	Insufficient availability of labour with the required skills	Uncertain economic conditions	High firing costs	High hiring costs	High payroll taxes	High wages	Costs of other inputs
Negative demand shock	0.09456***	0.03657	-0.00293	0.37501***	0.13032***	0.07216***	0.15571***	0.12529***	0.07497***
	(4.137)	(1.490)	(-0.127)	(15.281)	(5.657)	(3.101)	(6.550)	(5.480)	(3.169)
Negative finance shock	0.22526***	0.86564***	0.09137***	0.32030***	0.28839***	0.27558***	0.32702***	0.25602***	0.32039***
	(9.480)	(35.035)	(3.788)	(11.873)	(11.981)	(11.465)	(12.853)	(10.670)	(13.170)
Volatility of demand	0.05347	0.06170	0.00453	0.27106***	0.09776**	0.01632	0.06638	0.03137	0.04539
	(1.125)	(1.197)	(0.094)	(4.675)	(1.980)	(0.331)	(1.309)	(0.650)	(0.920)
Persistence of a negative demand shock	0.01660	0.02042	-0.03929***	0.09455***	0.03627***	-0.00039	0.03010**	0.03604***	0.00596
	(1.321)	(1.555)	(-3.080)	(5.826)	(2.836)	(-0.031)	(2.177)	(2.822)	(0.468)
Share of permanent employees	-0.00253***	-0.00181***	0.00158***	-0.00515***	-0.00322***	-0.00099*	0.00067	-0.00042	-0.00139***
	(-4.843)	(-3.209)	(2.927)	(-8.362)	(-5.843)	(-1.844)	(1.227)	(-0.792)	(-2.587)
Share of skilled employees	-0.00137***	-0.00038	0.00166***	0.00041	-0.00095***	-0.00018	-0.00107***	-0.00027	-0.00065**
	(-4.355)	(-1.142)	(5.180)	(1.200)	(-2.984)	(-0.563)	(-3.240)	(-0.869)	(-2.005)
Tenure of employees: more than 5 years	-0.00080**	-0.00149***	-0.00396***	0.00115***	0.00029	-0.00174***	-0.00129***	-0.00211***	-0.00096***
	(-2.230)	(-3.837)	(-10.776)	(2.989)	(0.790)	(-4.715)	(-3.399)	(-5.837)	(-2.601)
Any bargaining agreement	0.08091***	-0.02090	0.09034***	0.05314**	0.09758***	0.03023	0.07821***	0.06501***	0.04536*
	(3.253)	(-0.774)	(3.599)	(2.022)	(3.865)	(1.176)	(3.061)	(2.618)	(1.744)
Firms decreasing permanent employment between 2010-13	**-0.01024**	**0.11127***	**-0.08016***	**0.21338***	**0.11355***	**-0.01097**	**0.08262***	**0.05205**	**0.01502**
	(-0.431)	**(4.451)**	**(-3.340)**	**(7.995)**	**(4.718)**	**(-0.454)**	**(3.276)**	**(2.176)**	**(0.617)**
Country, size and sectoral fixed effects, as well as country group dummies, included	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**
Observations	19,233	19,234	19,344	19,383	19,308	19,292	19,360	19,301	18,821
Model degrees of freedom	41	41	41	41	41	41	41	41	41
Wald Stat	2067	3299	2809	3240	3000	1830	3272	2351	2022
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo-R2	0.0857	0.158	0.118	0.163	0.127	0.0808	0.144	0.0958	0.0944
log likelihood	-12055	-10179	-11768	-10249	-11611	-11386	-10941	-12088	-11166

Note: robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, average marginal effects reported, unweighted regressions.
Source: Savšek (2018; adapted from WDN3), with additional statistics.