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during COVID**

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Short-Time Work schemes and labour market flows in Europe during COVID*

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Abstract

In this paper we investigate the impact that Short-Time Work schemes (STWs) had on employment and labour market flows during the COVID emergency of 2020 in four of the five largest economies of the EU. Most European countries used STWs at this time to alleviate the negative impact of sanitary measures like lockdowns. Looking at labour market stocks and flows, we document that these schemes were widely adopted and likely prevented substantial job losses. However, they failed to protect temporary workers. Moreover, in all countries, transitions from employment to non-participation reached unprecedented levels. These flows are reverted in subsequent quarters, which implies that many workers postponed job search during the lockdown. We do not observe permanent increases in non-participation, but we document a large fall in flows between temporary and permanent jobs. We interpret this as a drop in labour market mobility. We find that vacancy posting and firm dynamics may be able to explain part of the observed differences between countries.

Key words: labour market flows; short-time work; inactivity; labour force survey.

JEL codes: C82, E24, J21, J60

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1 Introduction

In 2020, the COVID-19 pandemic brought large disruptions to European economies. How well did European economies respond to the COVID pandemic? At first glance, it may appear that the European labour market fared better than the US, with smaller and more gradual increases in unemployment.¹ However, this masks the effect of employment support measures that were greatly extended during COVID and ignores other disparities between the dynamics of, for instance, permanent and temporary jobs.

In order to give a more comprehensive understanding of labour market developments in Europe, in this paper we document, compare and analyse the impact that the pandemic and these policies had on the labour markets stocks and flows of four of the five largest economies in the European Union: France, Italy, Spain and the Netherlands. These countries enacted similar employment protection policies during the first months of the pandemic: the expansion of *Expedientes de Regulación de Empleo* in Spain, *Activité Partielle - Chômage Partiel* in France, *Cassa Integrazione Guadagni (CIG)* in Italy and *Tijdelijke Noodmaatregel Overbrugging voor Werkgelegenheid (NOW)* in The Netherlands. These public schemes provided replacement wages for those unable to work during the lockdown and subsequent activity reduction.² Their aim was to prevent excess turnover and large unemployment increases from an external shock, which did not come from underlying weaknesses in the economic system, unlike the Great Recession.³

We measure labour market stocks and flows using the most recent longitudinal labour force surveys (LFSs), as opposed to other commonly used data sources, such as registered employment/unemployment and other administrative datasets. There are a number of reasons to motivate this choice. Firstly, in Europe, Eurostat has homogenised the definitions, methodology and structure of national surveys, making the data comparable across countries. Since we want to study how COVID affected different countries and how they implemented STWs, having homogeneous definitions and data with the same structure (rotating panel survey) lends itself naturally to our study. Secondly, LFSs are used to calculate the official numbers of unemployment, which means they collect information on search behaviour of workers, which is not easily available in most administrative datasets.

To illustrate the impact of STWs, we construct counterfactual series of labour market stocks and flows where we reclassify all workers under such schemes as inactive instead of employed. The difference between the actual and the counterfactual time series illustrates the impact of STWs. Moreover, we separate permanent and temporary/casual workers due to their very different labour

¹See e.g. [Gros, Ounnas, et al. \(2021\)](#)

²In section 2.1 we detail the forms these schemes took for each country.

³Similar schemes were also used in the Great Recession to a much lesser extent. For example, see [Cooper, Meyer, and Schott \(2017\)](#), who provide an assessment of the impact of STWs in Germany during this time.

flow dynamics ([Bentolila et al. \(2012\)](#), [Silva and Vázquez-Grenno \(2013\)](#), [Lafuente, Santaeulàlia-Llopis, and Visschers \(2021\)](#)). Our main findings can be summarised by five points.

First, ignoring the role of STWs severely underestimates the impact of COVID: if we do not take them into account, all four countries show modest employment losses, with Italy and the Netherlands being *above trend* in permanent employment during the lockdown. If we consider workers on STWs as non-employed, the fall of employment in the second quarter of 2020 is around 10% in Spain and France. This brings European numbers in line with reported employment losses in the US, with employment decreasing by around 15% during lockdown ([Ansell and Mullins \(2021\)](#), [Gros, Ounnas, et al. \(2021\)](#)).

Second, we find that STWs exacerbated existing inequalities in the labour market by protecting regular or permanent jobs successfully but temporary or casual jobs to a much lesser extent. The impact of employment protection is mostly limited to the second quarter of 2020 (coinciding with the first lockdown). Permanent employment mostly recovers its previous level by the end of 2020. In contrast, temporary workers experience severe job losses, with STWs having a smaller impact. These workers have borne most of the costs of this recession, which suggests an increase in inequality as a result from the COVID crisis. Moreover, we note that STWs played a role in the unprecedented disparity between hours and employment, which becomes clear when using different measures for productivity.

Third, we show that the fall in temporary employment comes from a fall in the job creation flows, i.e. from non-employment to temporary employment, and a rise in job destruction flows, i.e. flows from temporary employment to non-employment. The former do not recover in Spain and the Netherlands, while they mostly bounce back in France and Italy. For Spain, this pattern is similar to the one experienced during the Great Recession. Hence, temporary workers' losses are partly due to increased job destruction, but mostly to a persistent reduction in labour demand.

Fourth, we document that a rise in inactivity masks another phenomenon: delayed search. We find a 'twin peak' pattern in flows between inactivity and unemployment, with a large 'peak' in the flow from unemployment to inactivity in the second quarter of 2020, followed by a 'peak' in the reverse flow the next quarter. This finding mirrors [Carrillo-Tudela et al. \(2021\)](#), who find a similar pattern in the UK. Workers postponed job search during the pandemic.⁴ As [Elsby, Hobijn, and Şahin \(2015\)](#) noted, flows to and from inactivity play a key role in the observed volatility of unemployment. It also questions, as in [Jones and Riddell \(1999\)](#), the classification of individuals who delay their job search for a short time as 'out of the labour force', altering the composition and behaviour of the pool of non-participants, which results in highly heterogeneous job-finding rates. This has direct implications for the estimation of search and matching models.

⁴With our data we cannot calculate the direct contribution of labour demand and labour supply to the fall in employment – however our findings are highly suggestive that the former played a major role.

Finally, another striking phenomenon is a failing job-ladder represented by a large decline in flows from temporary to permanent employment. This is most evident in Spain and the Netherlands. In Spain the drop in temporary to permanent flow occurred mostly during the second quarter of 2020, after which it started to recover. While in the Netherlands, this flow has been decreasing since the beginning of the pandemic and continued to do so up until the fourth quarter of 2020, the end of our sample period. This is especially concerning, because there is growing evidence of the importance of job ladders for earnings growth and job security (i.e. [Krolikowski \(2017\)](#), [Haltiwanger et al. \(2018\)](#) in the US and [Pérez and Sanz \(2005\)](#), [Jung and Kuhn \(2019\)](#) and [Burdett et al. \(2020\)](#) in Europe) but it rarely gets the same attention as unemployment in policy discussions.

We then explore one potential explanation for the increases in non-employment and the fall in transitions to employment: labour demand and firm dynamics. Vacancies fell strongly in Italy and the Netherlands, but not so much in Spain. We compare registered business openings and closures, while noting diverging patterns across countries since the Great Recession. There is no evidence of increased business closures during COVID – they actually fall in all countries. This reflects that the economic policies put in place have saved many firms from failing, most notably in France – with the caveat that some firms which would otherwise have closed down might be kept alive by these policies. Firm openings do not increase after the lockdown in Spain and the Netherlands, but they do bounce back in France. Linking this to the losses of temporary employment, which are likely to be heavily used by new firms, suggests an important role of firm entry in job creation and employment.

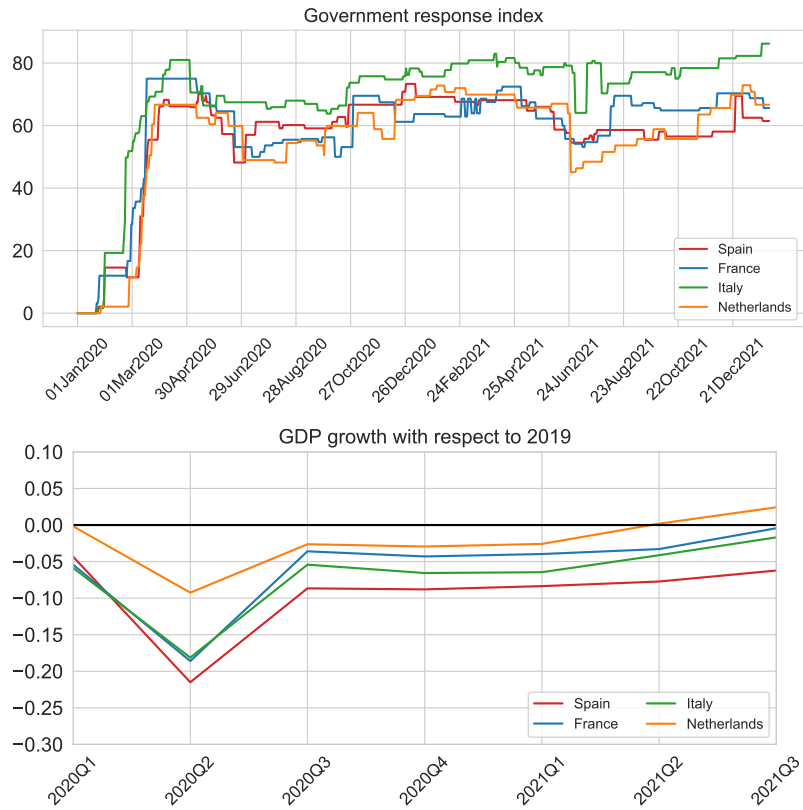
The rest of the paper is structured as follows: section 2 describes the economic and policy response to the pandemic, institutions and data, section 3 analyses the impact of STWs on labour market stocks and flows; section 4 explores the role of labour demand; section 5 concludes.

2 Economic and Policy Response and data description

The COVID-19 pandemic affected European economies in three main ways: (i) by its direct impact in the workforce (sick leave, death), (ii) by the impact of containment measures (lockdowns, restrictions to economic activity and others) on the wider economy and (iii) by the policy reaction to that economic impact. In this study we focus on the effect of the “Great Lockdown” on the economy starting March 2020 and its recovery over the next months. This is because the economic response measures overlap with the direct impacts, making it very hard to assess them separately.⁵ Moreover, some of these measures were extended beyond the hard lockdown phase, making the rest of 2020 and the entire year of 2021 ‘treated’ periods with varying intensities over time.

⁵As in [Lafuente, Santaaulàlia-Llopis, and Visschers \(2021\)](#), we cannot separate each of these three shocks in our data as the frequency of the LFSs is quarterly. In some cases it is possible to separate different sources of

Figure 1: Policy Stringency Index



Source: Upper panel: Our World in Data. Lower panel: Own elaboration on Real GDP series from Fred.

Figure 1 illustrates this point by comparing the policy measures put in place with economic growth. For the former we use the COVID-19 Policy Stringency Index,⁶ as elaborated by the Oxford COVID-19 Government Response Tracker (Hale et al. (2021)), as an indicator. The upper panel of figure 1 shows the evolution on this index for France, Italy, Spain and the Netherlands. The measures follow similar patterns and all countries had similar levels of stringency, with Italy being the toughest and the Netherlands often having the lightest restrictions. These similarities are underscored by GDP growth as compared to the same quarter in 2019,⁷ in the lower panel. Around the same time the sanitary and economic measures were the strictest, during the first lockdown, GDP fell the most and started recovering when these measures were loosened. We now give a more detailed description of the relevant economic measures enacted by the four countries we focus on in this paper.

shocks, see for example Alemán et al. (2020), who study the impact of sanitary measures on mortality in Spain.

⁶The stringency index is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, re-scaled to a value from 0 to 100 (100 = strictest).

⁷We compare growth with respect to the same quarter in 2019 instead of the same quarter in the year before because of the huge drop in GDP in 2020. If we would compare 2021 to 2020 it would mask the fact that GDP is still below the level of 2019, before the start of the pandemic.

2.1 Policy response by country

To counter the economic impact of the pandemic, most European countries dramatically expanded already existing Short Time Work Schemes (STWs) to allow firms to retain their workers even when there was very reduced or no economic activity taking place.⁸ Firms were granted increased flexibility in paying social security contributions and taxes, credit lines and (in some cases) direct subsidies. We now briefly describe specific features of each country's response which are relevant for labour market flows.⁹

Spain

The main response package of measures to the economic impact of the COVID crisis was announced on March 18th. Most notably, it expanded the *expediente temporal de regulación de empleo* (ERTE) program, creating a new type of short-time work scheme. Workers receive a proportional amount of their salary (typically 70%), paid from their social security contributions. Under conventional ERTes, the worker would be consuming her own unemployment insurance allowance, but in its expanded version the worker is granted an equivalent extension of her allowance, to be used when unemployed. On the other hand, the firm receives a large discount on the social contributions it pays. The key condition for this discount is that the firm compromises to not lay off any worker in the 6 months after the end of STWs.¹⁰ For temporary workers, their contracts are automatically extended for the duration of their STWs. However, it is worth noting that the firm can choose to not renew any temporary contracts *not* under a STWs that expire within those 6 months.¹¹ In addition to this, state-sponsored loans were made available for firms and self-employed to use as collateral for credit and deadlines for taxes and duties were extended as well.

France

In a similar way, the principal economic measure in France during the pandemic was a modified version of already existing STWs. The maximum duration of STWs was increased from 6 months to 12 months¹² and the replacement ratio was increased at the start of the lockdown to up to

⁸For example, [Adams-Prassl et al. \(2020\)](#) documented the wide-spread use of STWs in the UK, US and Germany already early on in the pandemic using data from real time surveys.

⁹For a more details on these policy measures, see the IZA report [Eichhorst et al. \(2021\)](#) by Raul Ramos for Spain, Pierre Cahuc for France, Tommaso Colussi for Italy and Egbert Jongen and Paul Verstraten for the Netherlands.

¹⁰If the firm breaches the terms and lays off *any* worker before their contract ends, all subsidies received by the firm must be refunded in full to the administration.

¹¹The right to reduced hours for workers with family care needs is also reinforced.

¹²Later on additional exemptions were given to firms whose activities were expected to be permanently weakened, which means the maximum duration of STWs used by these firms was extended to 24 months.

100% for minimum wages and 84% for the highest wages. The costs were covered by the French government in the form of a reimbursement to employers who paid their employees. Unlike in Spain, there was not a zero dismissal condition for the firm to apply for subsidies to fund STWs. However, stricter regulations on collective dismissals were put in place. Other measures included the loosening of eligibility criteria for unemployment benefits and temporary agency workers were supported by requiring salaries to be paid out for the total expected duration of their task. Firms were supported by extending deadlines for taxes and social payments, and there was the possibility for tax rebates in extreme circumstances.

Italy

Like Spain and France, Italy extended already existing STWs, *Cassa Integrazione Guadagni Ordinaria* (CIG). In regular times, CIGs are partly paid by firms and allow workers to receive unemployment benefits (with an 80% replacement rate) for a maximum period of 13 weeks, renewable up to 52 weeks. These were only used for temporary falls in production. After expiration, the worker returns to her post. At the beginning of the pandemic a new type, CIG-covid, was introduced and its funding by the state was extended. As in Spain, the government introduced a suspension of lay-offs for two months which was extended well into 2021. These measures covered mostly permanent workers. For seasonal workers and the self-employed, emergency subsidies were introduced between March and June 2020. In this way, these workers may lose their job but could still count on income sustenance. Rules regarding temporary contracts were relaxed, allowing for the renewal of contracts beyond previous limits and for any reason. The government provided emergency liquidity to firms, in the form of tax relief, loans and collateral and suspended bankruptcy procedures from March until June 2020.

Netherlands

Similarly, the Dutch government made use of STWs (Tijdelijke Noodmaatregel Overbrugging voor Werkgelegenheid or NOW) in order to compensate for the adverse economic effects of the lockdown. NOW worked in the following way: if firms would suffer drops in sales of more than 20%, the government would provide financial support that covers 90% of all wages to be paid by the firm. [Eichhorst et al. \(2021\)](#) report that during the initial lockdown around 139,000 firms made use of the subsidy, covering wages of around 36% of all employees. In addition, there was a separate scheme for flexible workers who had lost a substantial part of their income. Other measures included special welfare benefits for the self-employed, subsidies for firms operating in sectors that particularly suffered from the sanitary measures in place, and tax and loan payment extensions were given.

2.2 Institutional background

As we have hinted in the introduction, the presence of a dual labour market, characterised by the coexistence of regular contracts and temporary (less protected) contracts, plays a large role when examining the flows. However, also employment protection legislation (EPL) and other institutional features, like unemployment benefits, can affect flows.

All countries in our sample share common institutional features, with specific variations by country. This is important for our analysis since institutional variation is not as large as it would be compared to the UK, for example. Table 1 provides a summary of the main labour market policies, as averages over the 2008-2019 period, in Spain, France, Italy and the Netherlands. The UK serves as reference point. The Employment Protection Indices, which measure the stringency of employment protection (such as severance payments), are very similar in France and Spain, with less protection for temporary workers in Italy and the Netherlands. This reflects a common regulatory trend: while France and Spain have tried to bring labour market duality to an end with several reforms, both Italy and the Netherlands have promoted temporary work in the last 10 years. In particular, the Netherlands is the country with the highest protection for permanent workers and lowest protection for temporary workers. However, when compared to the UK, all of the 4 countries have more stringent employment protection for both types of workers.

In all countries union coverage is rather high and the government spends a large amount on unemployment insurance, particularly in Spain and France. Hourly minimum wages in France and the Netherlands are the highest, but low in Spain (even lower than in the UK). Finally, Spain, France and Italy spend considerable amounts on hiring incentives and training for unemployed workers, whereas the Netherlands is more comparable to the UK in this regard.

Table 1: Summary of Labour Market Institutions for selected European countries

	Spain	France	Italy	Netherlands	United Kingdom
EPL (PC)	2.33	2.83	2.98	3.32	1.68
EPL (TC)	3.23	3.21	2.66	1.27	0.50
Union Coverage	80.93	98.06	100	82.56	29
Minimum Hourly Wage	8.11	11.91	–	11.03	9.45
Unemployment insurance	2.16	1.92	1.01	1.51	0.27
Training	0.14	0.29	0.15	0.09	0.02
Employment Incentives	0.14	0.05	0.20	0.03	0.01

Source: OECD stats. Averages from 2008-2019. Unemployment Insurance, Training and Employment incentives are measured as percentages of GDP expenditure in each policy. Minimum (real) hourly wage is measured at 2020 prices in PPP. ELP indexes are elaborated by the OECD, version 3.

2.3 Data and definitions

We use the confidential and longitudinal versions of labour force surveys (LFS) of Spain, France, Italy and the Netherlands for our analysis.¹³ All datasets are quarterly, and the Spanish, French and Dutch LFS have a similar rotating panel: households are interviewed for six consecutive quarters in France and Spain and five consecutive quarters in the Netherlands. The structure of the Italian LFS is slightly different and follows a 2-(2)-2 scheme. Households are interviewed for two consecutive quarters, then there are two quarters without interviews, after which the household is interviewed for two more consecutive quarters. In all countries interviews are carried out continuously within the sample quarter. Samples are stratified and our sample size fluctuates between 122,000 and 148,000 individual responses in Spain in our sample period, between 68,000 and 111,000 observations in France, between 62,000 and 71,000 in Italy in the longitudinal version¹⁴ and between 64.000 and 106.000 in the Netherlands.

The questions are standardised as per Eurostat requirements, and include enough information to classify an individual's labour force status as: employed in a permanent job, employed in a temporary job,¹⁵ unemployed, non-participant (inactive) and self-employed. Given the dual-labour market structure present in all four countries, we separate employment into temporary and permanent. These employment types are very different in nature, as extensively documented in the literature.¹⁶ We also restrict our analysis to individuals aged 16-65.¹⁷

The weights provided by the different statistical agencies, which give a specific sampling weight to each household, are meant to make the sample representative of the population at the quarter it was sampled. This means that constructing flows can be problematic, since in every quarter there are missing observations due to non-responses and households exiting the sample after their last interview. Adjusted weights for flows are not provided for Spain and France. Thus we do not weight flows to make results comparable.

We check for attrition for Spain, France and the Netherlands by checking how many people

¹³The Spanish LFS (EPA in its Spanish acronym) is carried out by the Spanish National Statistical Institute (INE), the French L'enquête Emploi is carried out by the French National Institute of Statistics (Insee), the Italian LFS, Rilevazione sulle forze di lavoro, by the Italian National Institute of Statistics (Istat), and finally, the Dutch LFS, the enquête beroepsbevolking, is carried out by the central bureau of statistics (CBS).

¹⁴Italy has three versions of the LFS, the 12-month version, which allows for tracking people with a 12 month interval, the 3-month version, which allow for tracking with a 3 month interval and a cross-sectional version. For the flows we make use of the 3-month version and for the stocks we use the cross-section.

¹⁵For France, Italy and the Netherlands, we group all workers not on a regular contract as temporary. Güell, Lafuente, Sánchez, and Turon (2021) follow a similar approach for Germany when drawing comparisons for Spain, showing the dynamics of all non-regular contracts are very similar to all Spanish contracts classified as 'temporary'.

¹⁶See for example Blanchard and Landier (2002), Boeri and Garibaldi (2007), Costain, Jimeno Serrano, and Thomas Borao (2010), Bentolila et al. (2012), Bentolila, Dolado, and Jimeno (2020).

¹⁷In Spain, we also exclude discontinuous workers when calculating job market flows, due to their atypical behaviour.

missed an interview in each quarter.¹⁸ Attrition was not significantly affected by the pandemic in Spain and the Netherlands. In France, attrition increased from 10% to around 25% during the first lockdown. Since we use weights for stocks and the flows are quite comparable across countries, we do not consider attrition to have affected the results substantially. We report the evolution of attrition in figure 11 in appendix A, where we also give a short description on the interview methods of the four LFSs.

For Spain, France and Italy we are able to identify whether someone is on an STWs by looking at the answer to the question: “[What are the] reasons for not working in the reference week, if you had a job”. This question is asked to all individuals of working age who report being employed at the time but were absent from work during the reference week. If someone is subject to a STWs, they should answer that they are on a “temporary regulatory work arrangement” (ERTE) in Spain, “partially employment” in France and on a “redundancy fund” (CIG) in Italy. The full answers are detailed in table 2 in appendix A. Unfortunately, the Dutch LFS does not allow to identify whether someone is on an STWs, as this is dealt with by a separate institution and considered confidential information.

3 Labour market stocks and flows

We now describe labour market stocks and flows between five labour market states: Employed with a permanent contract, employed with a temporary contract, self-employed, unemployed and inactive. As noted above, temporary and permanent employment have different dynamics, but they were also affected differently by the use of STWs. Stocks are used for calculating unemployment and participation rates, and therefore constitute a key metric for economists and policy makers. Labour market flows or transitions help explain the changes in stocks. In particular, we seek to quantify the contribution of job destruction, job creation and search behaviour of non-employed workers to the evolution of employment and non-participation during the pandemic.

3.1 Raw Stocks

Figure 2 shows the evolution of job market stocks for Spain, France, Italy and the Netherlands (from top to bottom) from the first quarter of 2005 until the last quarter of 2020, zooming in on the last 9 quarters in the right panel.¹⁹ The Great Recession and the COVID recession are marked by shaded areas in light blue in the left panel. The five labour market states are defined as: employed with a permanent job (P), employed with a temporary job (T), unemployed (U),

¹⁸Unfortunately, the structure of the Italian data does not allow for this. The 3-month flow files come in a form where individuals are already matched to the interview results of the next quarter. If they did not take one of these interviews, the observation does not show up, making it impossible to quantify.

¹⁹For stocks, in Italy our time-series is shorter, since only quarterly data is available from 2008 onward. For Spain, the series is longer, ending in the second quarter of 2021.

inactive or non-participant (I) and self-employed (A). Population weights are used for stocks. In order to make comparisons across countries easier, stock levels are normalised by dividing by the total (weighted) working age population $N = P + T + A + U + I$. Therefore the left axis should be read as “percentage of the working age population”.

Permanent employment and inactivity The first thing to notice from the left panels of figure 2 is that in all countries permanent employment is the most common state, with close to 40% of all working age individuals having one in Spain, France and Italy, and over 50% in the Netherlands. Inactivity comes second, with the exception of Italy, where during the Great Recession inactivity levels were often above permanent employment. Italy’s inactivity share is the highest of all four countries.²⁰ The level of inactivity has been steadily declining in all four countries over the entire sample period, apart from a small increasing pattern in Spain from 2015. The Netherlands has the lowest inactivity share, around 10 p.p. less than the other countries. Self-employment is very stable in all economies, around 10%.

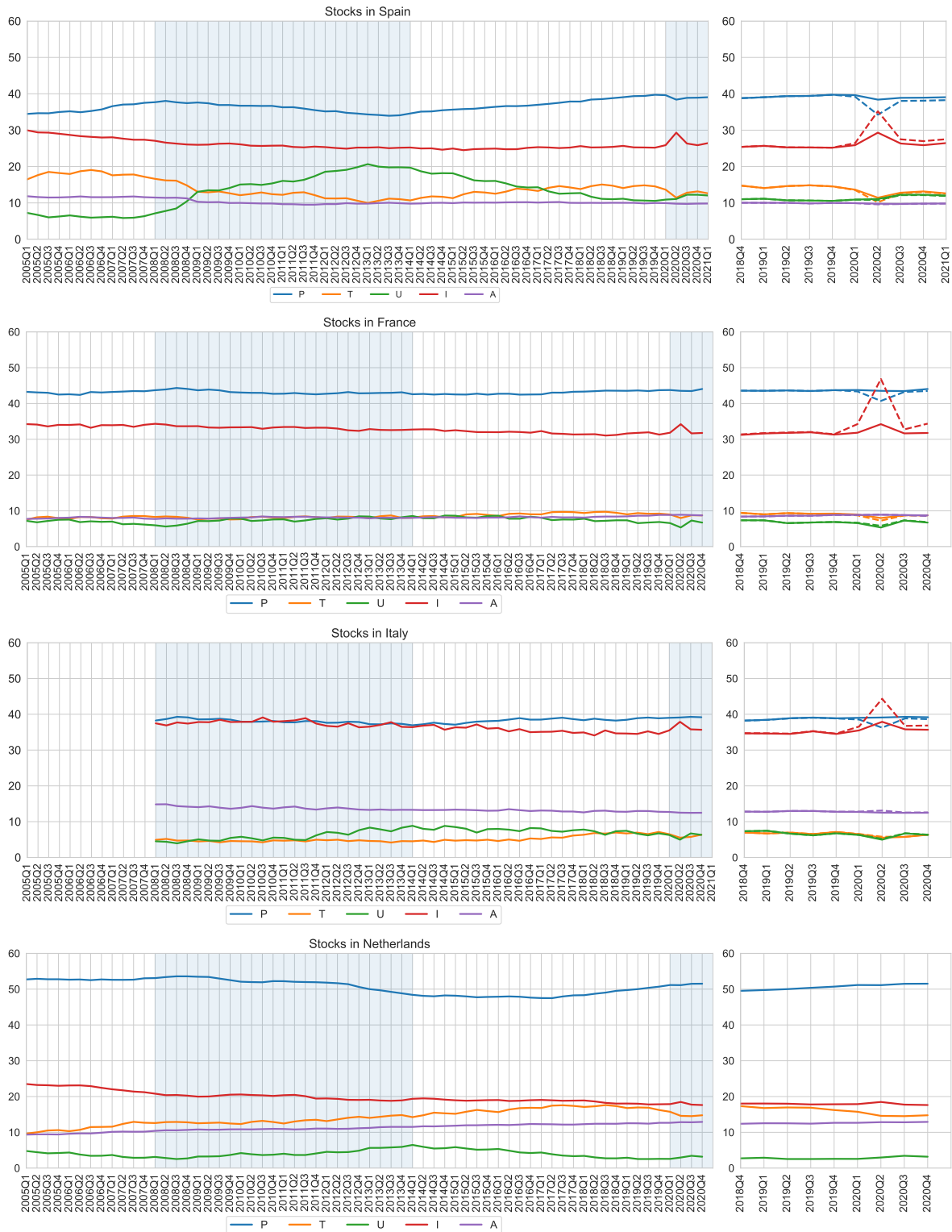
Mild cyclical patterns Compared to the US, European countries have lower employment cyclicity – with the exception of Spain, where unemployment dramatically increased during the Great Recession. This increase was mirrored by a fall in temporary employment and to a lesser extent in permanent employment. In Italy unemployment does not rise until 2011, which coincides with the sovereign default crisis of the Euro area at that time. The Netherlands also shows clear, but softer, cyclical patterns, while France shows very stable unemployment stocks.

Seasonal jobs and the growing importance of temporary employment Temporary jobs and unemployment are the most seasonal stocks, with small increases and drops every year, clearly visible in Spain and the Netherlands, and to a lesser extent in France. However, in Italy seasonal patterns are visible between non-participation and unemployment. This suggests that seasonal jobs in Italy may be carried out in the informal sector. Following this pattern, the share of temporary jobs compared to the total working population is the highest in Spain and the Netherlands. In Spain the highest level is right before the Great Recession (almost 20% of the working population). In the Netherlands the highest level is reached around 2016, also with a share of almost 20%. In both countries temporary employment rises from the recovery of the Great Recession. This phenomenon is also visible in France and Italy, though to lesser extent. Finally, in all countries the self-employment level (purple line) is stable around 10% throughout the sample period in all countries, increasing slightly in the Netherlands and France.

Impact of STW extensions The right panel of figure 2 zooms in on the left panel for the 2018-2020/21 period. The dashed lines display the alternative series of stocks, where all

²⁰Italy’s high inactivity rate is partly due to South-North regional differences but there are other structural reasons for this – see [Brugiavini et al. \(2012\)](#).

Figure 2: Labour Market Stocks, 2005-2021



Source: Own elaboration with data from CBS, INE, Insee, Istat

workers on STWs are classified as inactive.²¹ In this way, we can see the large impact that STWs had on the labour force. In this alternative classification, there were more people *strictly* inactive (not working, nor looking for employment) than employed under a permanent contract during the second quarter of 2020. Most of the difference between the dashed and solid lines for inactivity is compensated by a drop in workers on permanent contracts (dashed lines), with only small differences for temporary workers, which anticipates our finding that STWs protected mostly permanent jobs. This phenomenon is visible in all countries for which we can distinguish whether someone is on an STWs or not. Recall that we cannot not identify whether someone is on an STWs in the Netherlands. However, as reported by [Eichhorst et al. \(2021\)](#), around 36% percent of employees were on an STWs. If the division of STWs usage is similar to that of the other countries, this means the dashed line would look like the average of the French and Spanish. Not taking into account this extensive use of STWs can lead to severely underestimate the employment effects of the first lockdown of 2020, which could potentially bias productivity measures. That is, hours per worker and employment follow very different patterns, unlike in previous recessions where the two were highly correlated. However, since workers in STWs (as we consider them in this paper) contribute zero hours to production, the more workers in STWs the larger the disparity between hours and employment.²²

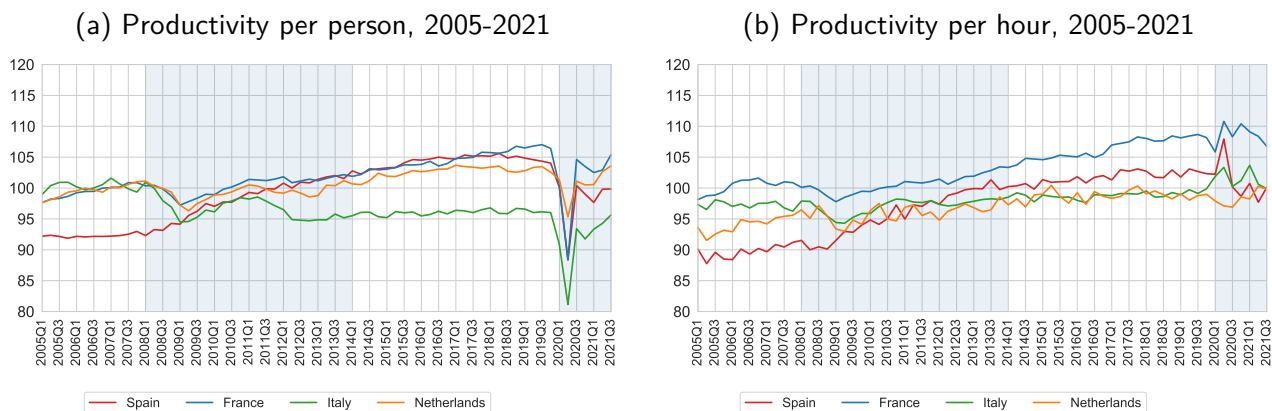
This is shown in figure 3, which shows measures of productivity per worker (left panel) and productivity per hour (right panel). While productivity per worker experiences an unprecedented fall in the second quarter of 2020 (including in the Netherlands) productivity per hour is comparatively stable. Given the uncertainty of recovery and large GDP losses, it is tempting to look at productivity to explain the path of GDP after the pandemic – but one has to be careful to consider the impact of STWs. The fact that until now these two measures had similar trends (in particular during the Great Recession) can lead to the mistake of using the employment-productivity measure when we want to be looking at hours-employment.

While the extension of STWs can explain the fall in effective employment and output per worker, the spike in the solid inactivity line cannot be accounted for solely for these schemes. These are workers who lost their jobs and those who stopped searching for one. This unusual increase in inactivity is short-lived, as it mostly reverts back after one quarter. Moreover, the

²¹In order to be classified as inactive, the Eurostat requires individuals who report not having worked in the interview week to have the expectation of returning to their main employment in the next 3 months. We found this condition to be hard to be satisfied during the second quarter of 2020, but most countries seem to have relaxed this condition, with the exception of Spain. This leads to classification problems. In a companion paper, [Lafuente and Ruland \(2022\)](#), we discuss the measurement issues in depth and correct the Spanish stocks using the panel dimension of the data.

²²[Lafuente, Santaaulàlia-Llopis, and Visschers \(2021\)](#) documented the patterns of hours per worker in Spain, noting that they fall even when taking STWs into account. This indicates that firms and workers are now more likely to adjust hours, and the adjustment follows a different pattern than in the Great Recession.

Figure 3: Productivity (all countries)



Source: Eurostat series “Real labour productivity per person” and “Real labour productivity per hour worked”, de-seasonalised, Index 2010=100

size of this spike is different between countries. Unemployment increases on quarter later in all countries, but this hard to appreciate with the raw stocks. Therefore, we detrend the data.

3.2 Detrending

To get a better idea of the impact of STWs and the changes in stocks in general, we detrend and de-seasonalise the data to see the impact of the COVID recession as in [Lafuente, Santaaulàlia-Llopis, and Visschers \(2021\)](#) and [Eyméoud et al. \(2021\)](#). That is, we run the regression

$$X_t = \beta_0 + \beta_1 t + \delta \mathbf{Q}_t + e_t \quad (1)$$

and recover the deviations from trend, e_t . For the regression in equation 1 we use data from 2016Q1 up to 2019Q4. This allows us to interpret the residual thereafter as deviations from the trend before COVID hit.²³ Figure 4 shows the results for the stocks of permanent workers, temporary workers, non-participants and unemployed for Spain, France, Italy and the Netherlands. Dashed lines depict the counterfactual series where all workers on STWs are classified as inactive. The onset of the COVID recession is marked with a vertical red line.

STWs protected permanent jobs Firstly, let us first focus on the counterfactual series for STWs. This series shows stark differences for permanent workers, much larger than for temporary workers,²⁴ as indicated by the smaller difference between the solid and dashed lines

²³We use a piece-wise linear trend approach as in [Lafuente, Santaaulàlia-Llopis, and Visschers \(2021\)](#) and [Eyméoud et al. \(2021\)](#). This is because we want to recover ‘forecasting errors’ as deviations from trend, while higher degree or smoother time trends could bias the estimates. Intuitively, figure 2 shows that a linear trend is a fair approximation of the evolution of stocks since 2016.

²⁴This finding, and a similar plot for hours worked in Spain are discussed in depth in [Lafuente, Santaaulàlia-](#)

Figure 4: Labour Market Stocks (all countries), deviations from trend



Source: Own elaboration with data from CBS, INE, Insee, Istat. The vertical axis is measured in percentages of the 16-65 population of each country.

in temporary employment compared to permanent in France and Spain. In Italy STWs did not protect temporary workers – recall that here casual workers were offered unemployment benefits or unconditional transfers instead. The increase in inactivity is breathtaking: almost 15% of Llopis, and Visschers (2021).

the working age population are on full STWs (for comparison these are around 3 million people in Spain or France, numbers that align with official social security records (see [Eichhorst et al. \(2021\)](#)). Recall that these are full-STWs, which means that these people worked zero hours. There were also workers with hour reductions that are not counted here. By the first quarter of 2021 for Spain or fourth quarter of 2020 for France and Italy, there was still a substantial number of people on STWs, between 1% and 5% of our sample. This confirms the findings of [Adams-Prassl et al. \(2020\)](#), who showed that STWs have had a large impact on the labour market in the UK, US and Germany, and puts the numbers of Spain, France and the Netherlands in line with the employment loss suffered by the US, where STWs were not activated to buffer the employment effects of the pandemic and the lockdowns ([Ansell and Mullins \(2021\)](#)).

Large temporary job losses and some permanent Turning to the 'original' series, indicated by the solid lines in figure 4, we focus first on permanent employment. In Spain and to a lesser extent in France, there is a drop in permanent employment. This fall is very modest compared to the counterfactual scenario where everyone on an STWs loses their job. In the Netherlands and Italy the share of permanent employment seems to have *increased* compared to trend – in the case of Italy this likely reflects the ban on layoffs. In all four countries there was a fall in temporary employment of about 2.5%. In France, Italy and the Netherlands the drop in temporary employment seems to decrease after the initial lockdown. In Spain temporary employment also recovered slightly after the initial lockdown at the beginning of 2020, but starts to decrease slightly again at the beginning of 2021. Most of these job losses, both permanent and temporary, are offset by an increase in inactivity. In all countries there is a visible increase around the second quarter of 2020, with the highest spike being in Spain and the lowest spike in the Netherlands.

Diverging unemployment patterns When looking at unemployment we can distinguish two different patterns. On the one hand there is France and Italy (the second and third rows of graphs), where there is a small drop in unemployment during the second quarter of 2020, followed by a small increase the quarter after, which disappears in the consecutive quarters. The graphs for Spain and the Netherlands (the first and fourth rows of graphs) show a rather different dynamic. Unemployment is increasing in both countries since the beginning of the pandemic. First the increase was small, however, from the second quarter of 2020 onward the increase in unemployment becomes steeper. This sharp increase lasts for one or two quarters, after which it stabilises. In both countries, unemployment has not returned to pre-pandemic trend yet in our sample period. Conversely, inactivity has returned to pre-pandemic trend in Spain and the Netherlands but is still above trend in Italy and France. To better understand these dynamics and differences between countries, we now consider labour market flows.

3.3 Flows

Labour market flows are measured forward, that is:

$$AB_t = \frac{A_t \rightarrow B_{t+1}}{A_t}, \quad (2)$$

the relative flow between labour market state A at time t and B at time $t + 1$ is the number of individuals who transition from state A at t to state B at $t + 1$, divided by the total observed individuals at state A at time t . The denominator only takes into account individuals for which we observe their state at time $t + 1$. Individuals with that information missing, either because they had their last interview at time t or because they did not respond in the next interview, are dropped. The flows have been detrended, following equation 2, to directly show the impact of the COVID recession. For reference, the raw, non-deseasonalised flows can be found in appendix B, where the high seasonality of temporary contracts becomes clear.

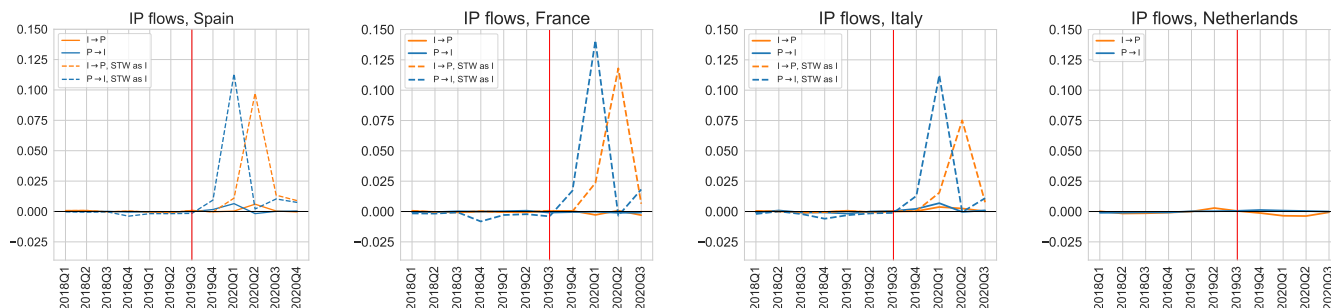
The figures below show the deviations from trend of flows in Spain, France, Italy and the Netherlands from left to right. Whenever is relevant, dashed lines indicate counterfactual series where all workers on full STWs are classified as inactive. We report relative flows as in equation 2 and gross flows, without the denominator but expressed, as the stocks, in percentages of the observed labour market size in quarter t . We have selected some flows that we believe show new interesting insights, but the rest of the detrended flows can be found in appendix C.

Permanent employment and inactivity: the impact of STWs

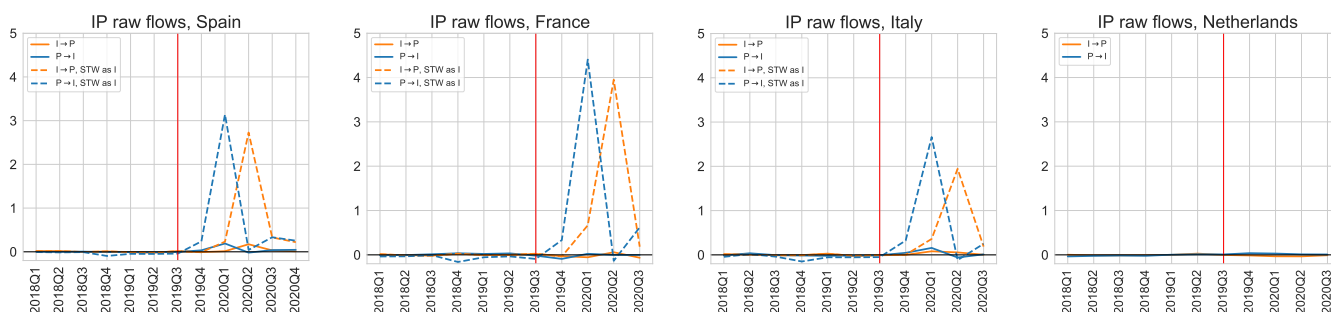
We first focus on the $IP - PI$ flows, displayed in the upper row of panels of figure 5 (part a). The ‘normal’ flows are dwarfed by the flows where everyone on an STW is classified as inactive. This is a graphical representation of the impact that STW schemes have had in the labour market, with unprecedented shares of the labour force moving between actively producing and inactivity. For example, in Spain the probability of transitioning to inactivity from a permanent contract goes from less than 1% without considering STWs to more than 10%. This difference is similar in Italy and even greater in France. However, the next quarter sees the reverse of this inflow, with a probability of close to 10% in Spain and France to transit towards permanent employment from inactivity. In this way, the increase in non-participation is short lived, and may explain the difference with the case of the US where the flows into inactivity have not been reversed that quickly – the macro manifestation of “the great resignation” (Sheather and Slattery (2021)). Even when not accounting for STWs, the solid lines show small increases in the flows into inactivity at the beginning of the lockdown in Italy and Spain, followed by an increase in the

Figure 5: IP and PI flows, deviations from trend, all countries

(a) Relative flows (transition probabilities)



(b) Gross Flows



Source: Own elaboration with data from CBS, INE, Insee and Istat

flow back into permanent employment the quarter after.²⁵

Part b of figure 5 reports the *gross flows*, normalised by the working population size instead of the initial stock. This is to check whether a decreased probability of going from state *A* to state *B* is mostly caused by an increased pool of workers in state *A* or by less people moving from state *A* to state *B*. For the flows between inactivity and permanent employment, this does not seem to make much of a difference with the results from panel (a), as figure 2 showed that inactivity and permanent employment are relatively similar.

The flows between permanent employment and unemployment are, in comparison, much smaller. These are presented in appendix C. The flows from unemployment, depicted in figure 24a, show only a small spike in job loss (*PU*) in Spain and the Netherlands. In fact, in these two countries the increase in gross permanent job creation has not compensated for the spike in the loss of employment of the previous period. In other words, there was a substantial increase in permanent job destruction that was not compensated during the recovery. In contrast, in France there is a modest drop in both job-loss and job-creation. Remarkably, Italy shows almost

²⁵Since flows are defined forward, the value at e.g. 2020Q1 indicates the flow from 2020Q1 to 2020Q2, hence the flow from before the initial lockdown, to mid-lockdown.

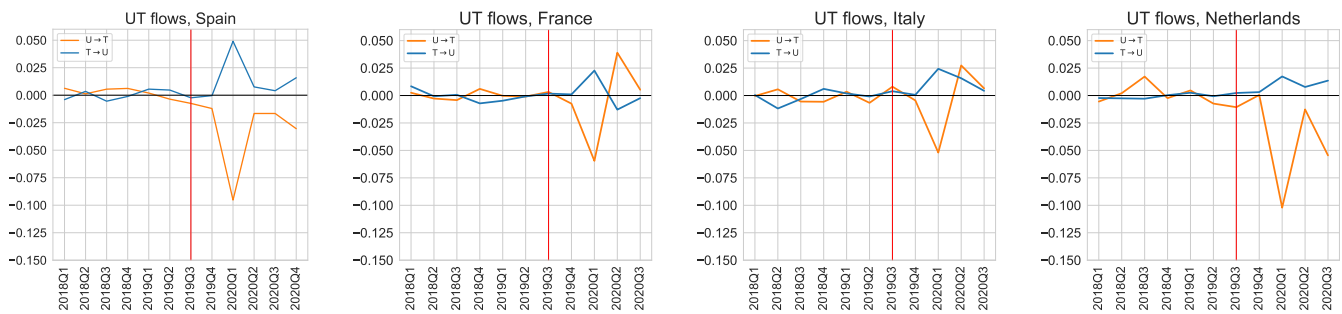
no visible change in the PU flow, and there is even a small spike in the probability of finding a permanent job from unemployment, UP , which disappears in the gross flows. This shows that the outright ban of dismissals in Italy has been much more effective than the soft conditions in France and Spain, linked to the use of STWs.

Temporary employment and unemployment: diverging patterns across countries

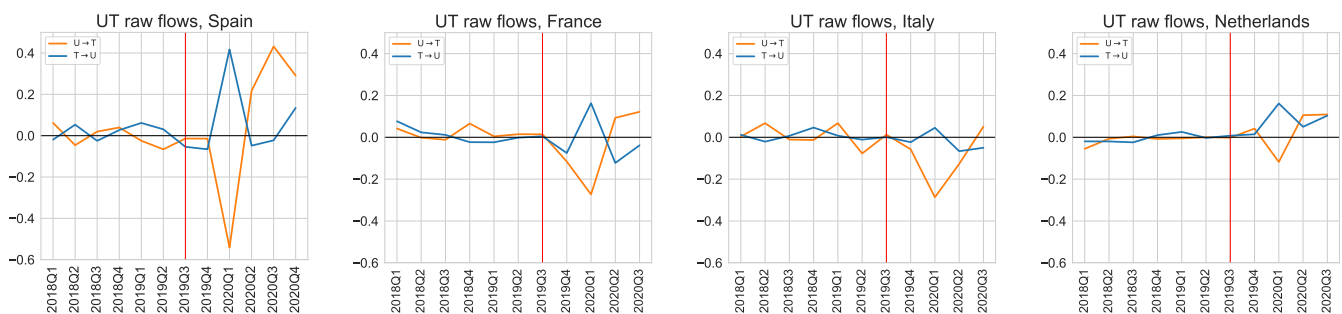
In contrast, the flows from and from temporary employment and non-employment are largely accounted by unemployment, instead of non-participation. This finding agrees with the growing literature in job search that finds the type of jobs that workers find from inactivity are different from those obtain from unemployment (Faberman et al. (2017)). In the European context, temporary jobs have larger flows from unemployment than permanent as they serve as entry points into the job market.²⁶

Figure 6: UT and TU flows, deviations from trend, all countries

(a) Relative flows (transition probabilities)



(b) Gross flows



Source: Own elaboration with data from CBS, INE, Insee and Istat

Here there are two groups of countries distinguishable. There is “the stable group”, France and Italy, where the drop in job-creation recovers after the lockdown and there is “the volatile

²⁶In the extreme case of Spain, flows from unemployment to temporary are an order of magnitude larger than from unemployment to permanent, see Silva and Vázquez-Grenno (2013) and Lafuente (2020b) for example.

group”, Spain and the Netherlands, where job creation UT remains below trend for the entire sample period after the initial COVID shock. Looking at the evolution of job-loss after the lockdown, we see that this drops to below trend in France, meaning that after the lockdown, the probability of losing a temporary job and becoming unemployed was less than the trend before the COVID recession. In the other three countries, job-loss remains above trend, which should lead to increases in the unemployment stock. However, the gross UT flow does recover (see figure 6b) in any country. This indicates that the pool of unemployed has increased to such an extent that the probability of finding a job has decreased even if there were more people finding jobs in absolute terms, relative to normal times.

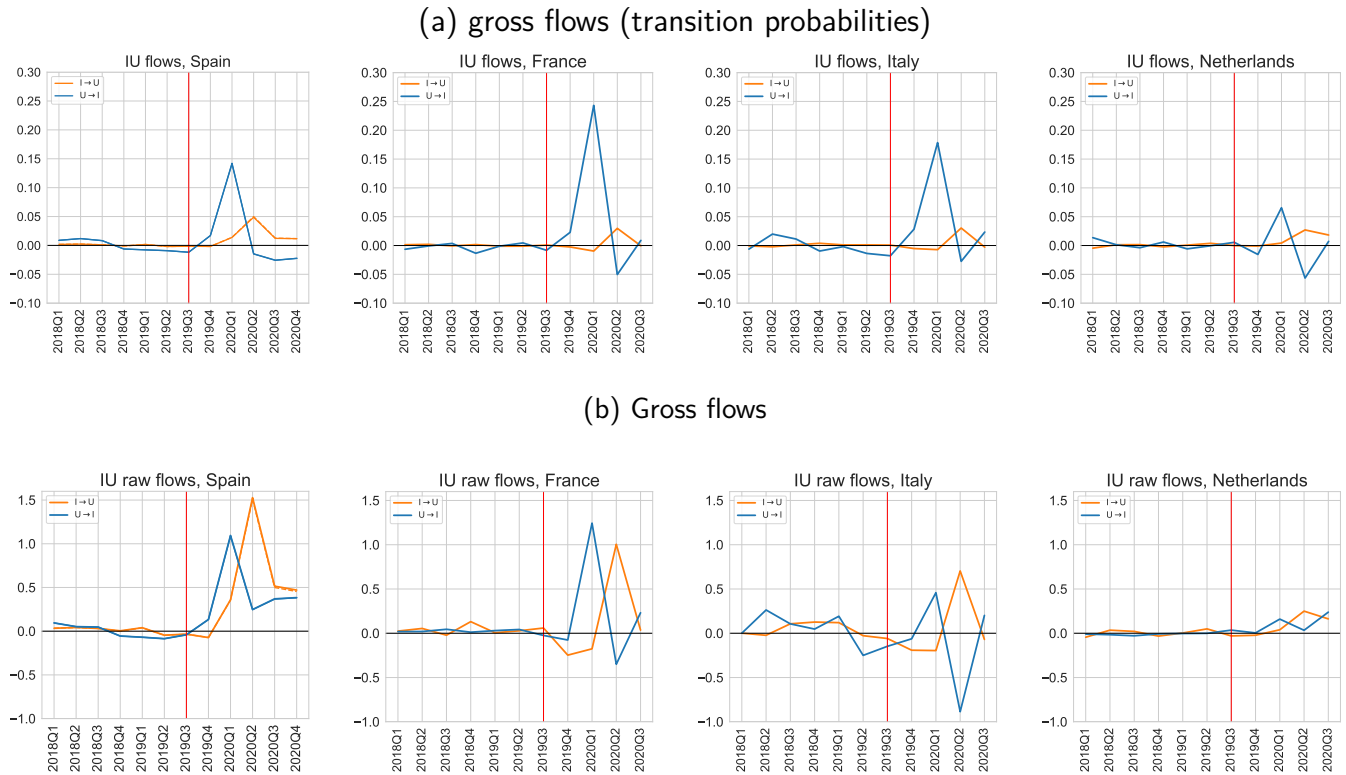
In terms of flows to inactivity, figure 25 in appendix C shows that the counterfactual series where temporary contract holders who were put on an STWs is classified as inactive, much like figure 5. Countries have much more symmetric responses in this case. The increase in ‘job destruction’ would have been more than 3 times as large as it really was in France and 2 times and 0.5 times as large in Spain and Italy, respectively, if we count workers on STWs as inactive. However, the difference between the real and the counterfactual flow is much smaller than for the $IP - PI$ flows, which again shows that STWs did not protect temporary jobs as much as permanent jobs. We conclude that flows from temporary employment, particularly the fall in job creation, is a major contributor to the increase in unemployment in Spain and the Netherlands.

Unemployment and inactivity: delayed search

Figure 7 shows the flows between unemployment and inactivity. In all countries we see an increase in the flow from unemployment into inactivity, between 2020Q1 and 2020Q2. This implies that people who were not working, but were looking for a job, gave up searching at the beginning of the COVID pandemic. Since in the quarter after the lockdown we see an increase in the opposite flow, IU , this means people did not permanently stop searching but delayed their search.

In other words, the observed spike in inactivity is mostly driven by changes in search behaviour, not job destruction. This is also the case in the UK, as shown in Carrillo-Tudela et al. (2021). Intuitively it makes sense that unemployed workers had little hope of finding jobs during the lockdown of the second quarter of 2020, and only started searching again (and thus being classified as unemployed) in the next quarter. Borrowing the terminology of Faberman, Mueller, Şahin, and Topa (2017), there were large movements in the *extensive* margin of job search. This phenomenon is least prevalent in the Netherlands, where the spike in the UI flow is the lowest. This might be because the first lockdown in the Netherlands was less strict as in the other countries, as shown in figure 1. But we also saw in figure 6 that the temporary job finding rate fell by 10% and the permanent one (in figure 24) by 2% in the same period. We find more persuasive as an explanation the overall high attachment to the labour market of the Dutch, as shown in figure 2.

Figure 7: UI and IU flows, deviations from trend, all countries



Source: Own elaboration with data from CBS, INE, Insee and Istat

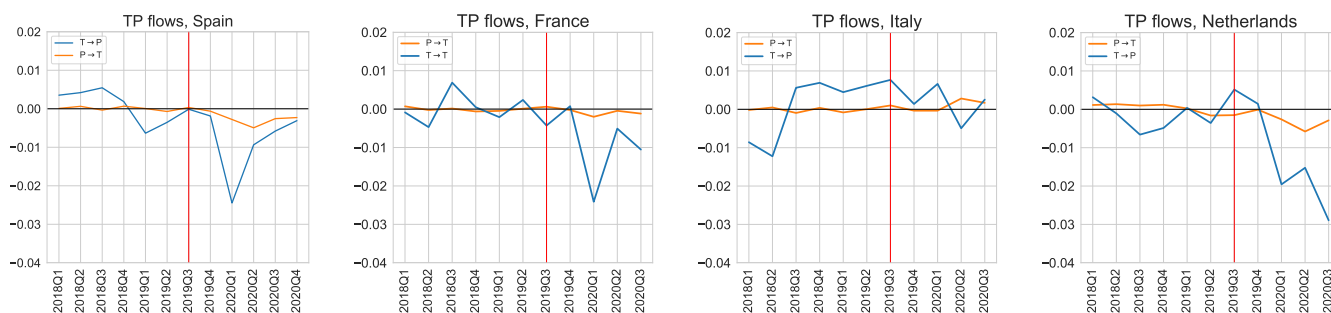
The same dynamic is also visible in the gross flows (see figure 7b). It becomes clear that the increase in the IU flow after the lockdown compensates for the share of people giving up searching during the lockdown in Spain, Italy and the Netherlands. In fact, in these countries there is actually more people that start searching after the lockdown and people that gave up search. This could mean two things: either people that lost their job during the lockdown waited until the strict sanitary measures were lifted to search for jobs, or people who were already inactive before the lockdown started searching again after this time. Moreover, the increase in unemployment of 2020Q3 that we observed in figure 4 does not only come from the job creation and job destruction margins, but from a large inflow of inactive workers searching for jobs. Carrillo-Tudela et al. (2021) find a similar increase in job search among non-participants in the UK. This pattern of delayed search reinforces the finding in Elsby, Hobijn, and Şahin (2015) and Kroft et al. (2016) that the participation margin plays a significant role in unemployment fluctuations during recession. The resulting changes in the composition of the unemployment pool are likely a key driver in the recovery of gross job creation as shown in figures 6 and 24. Given the important for the participation margin, in appendix E we construct and analyse the stocks and flows disaggregated by sex and show that the response was very similar for both sexes.

Temporary and permanent employment: collapsing job ladder

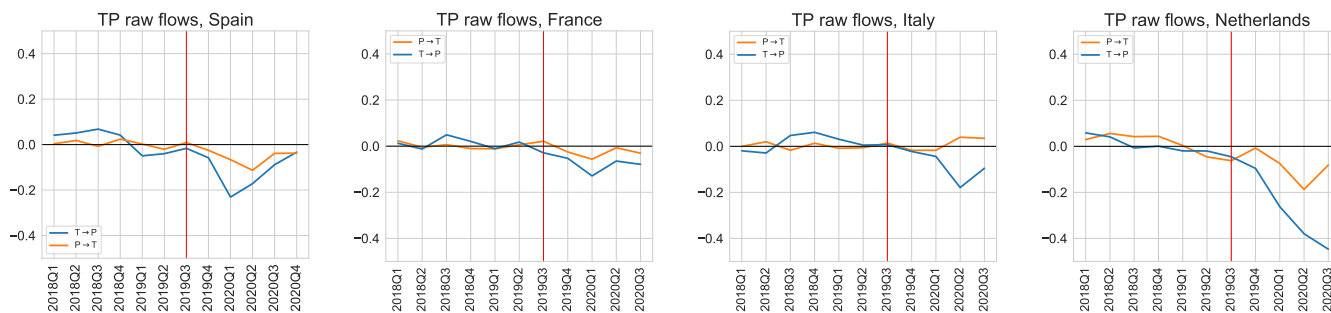
Finally we focus on job-to-job transitions between temporary and permanent employment, reported in figure 8. In Spain, France and the Netherlands there is a drop in transitions between temporary employment and permanent employment TP or contract conversion.²⁷ For Spain, France and (to a lesser extent) Italy this drop mostly happens between 2020Q1 and 2020Q2, and starts to recover afterwards. In the Netherlands this does not happen and the TP flows keeps decreasing. This could be happening partly because the Netherlands introduced a rather strict lockdown in the second half of 2020, but it might also be a more long-term trend. Incidentally, the PT flow also fell in these three countries in the COVID recession, reflecting a slower pace of job-to-job transitions, as it was the case during the Great Recession. This observation is not unique to the countries in our sample: Carrillo-Tudela et al. (2021) find a persistent decrease in job search of employed workers during the COVID recession in the UK.

Figure 8: TP and PT flows, deviations from trend, all countries

(a) Relative flows (transition probabilities)



(b) Gross flows



Source: Own elaboration with data from CBS, INE, Insee and Istat

The gross flows displayed in figure 8b confirm the findings in the relative flows, where the

²⁷In the context of interpreting temporary contracts as “stepping stones” (Güell and Petrongolo (2007), Boeri and Garibaldi (2007)) in the job ladder, declines in temporary to permanent job mobility can have serious consequences for individuals, see for example Pérez and Sanz (2005) and Davis and Haltiwanger (2014).

decrease in TP is the largest for the Netherlands. In France the downward trend is smaller in absolute terms. In Italy there is a difference between gross and relative flows pre-crisis, which likely reflects that the share of temporary workers has been decreasing since 2019, making the relative probability of finding a permanent job when on a temporary contract higher.

It is also noteworthy the more pronounced fall in the PT flow, which has a major over-representation of young workers, in Spain and the Netherlands. These flows have two main explanations. First, they can be caused by time-aggregation bias, as we only observe changes in states quarter to quarter, it could be that a worker loses a permanent job or quits (quite common among younger workers) and finds another employment within the interview window of 3 months. However, at least in the case of Spain, administrative data seems to confirm the finding that the PT flow is not due to aggregation bias but legitimate changes in jobs (Lafuente (2020a)). The other likely explanation is that temporary contracts are integrated in the job ladder beyond seasonal jobs in these countries, and serve as an entry point to better jobs. That is, if a young worker is unsatisfied with her permanent job and finds new employment, this may very well be a temporary one. Of course, these flows are just a fraction of total job-to-job movements. In appendix D we document and discuss a different measure for Job-to-job transitions, based on self-reported tenure. As the between-contract type flows, the within-contract job switches plummet during COVID, particularly the temporary to temporary ones in Spain. Given the importance of re-hiring and vacancy chains in job creation (Elsby et al. (2020)), the collapse of these flows is likely to play a major role in the surge of unemployment in Spain.

4 Discussion

We have found that STWs or furlough schemes played a major role in preventing employment losses during the COVID crisis of 2020 in four major EU economies. However, some employment loss did happen and these were disproportionately suffered by temporary workers in all four economies. Spain, having one of the largest shares of these types of contracts and the largest GDP loss during 2020 was the one that experienced major losses, resulting in an (delayed) increase in unemployment. Temporary jobs in the Netherlands were similarly affected despite having smaller output losses, since the importance of temporary and flexible work arrangements has grown in recent years. In addition, in all 4 countries we study we found the effects of delayed search – large inflows from unemployment to inactivity in the second quarter of 2020, followed by a reversal in the next quarter. Finally, in all countries we observe a collapse of the job ladder, measured as the flows between temporary to permanent employment, particularly in Spain and the Netherlands. From the literature we know that the slowing down of the “job escalator” is one of the major sources of permanent earnings losses and inequality among salaried workers.²⁸

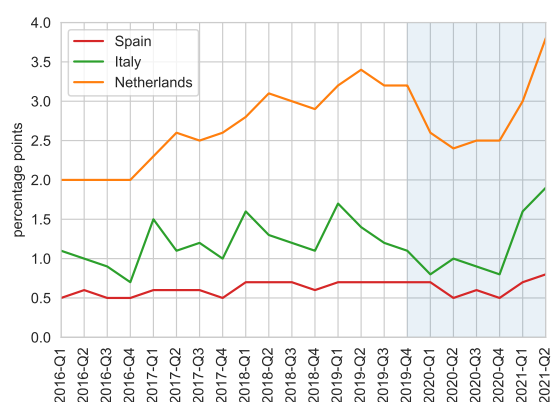
²⁸See, among others, Elsby et al. (2020), Krolkowski (2017) and Burdett et al. (2020).

Hence, it is likely to have long-term consequences. This fact, together with the collapse of job finding rates into temporary employment, strongly suggests that increased inequality in labour market outcomes are a consequence of the COVID recession. In this section we link some of these facts to labour demand and firm dynamics in order to shed more light on this.

4.1 Vacancies and firm dynamics

One of our main findings is that while there is evidence of (temporary) job destruction during the lockdown, there is a substantial fall in temporary job creation. We now take a look at the evolution of vacancies and firm dynamics as a potential explanation for these patterns.

Figure 9: Vacancy rate; Industry, construction and services



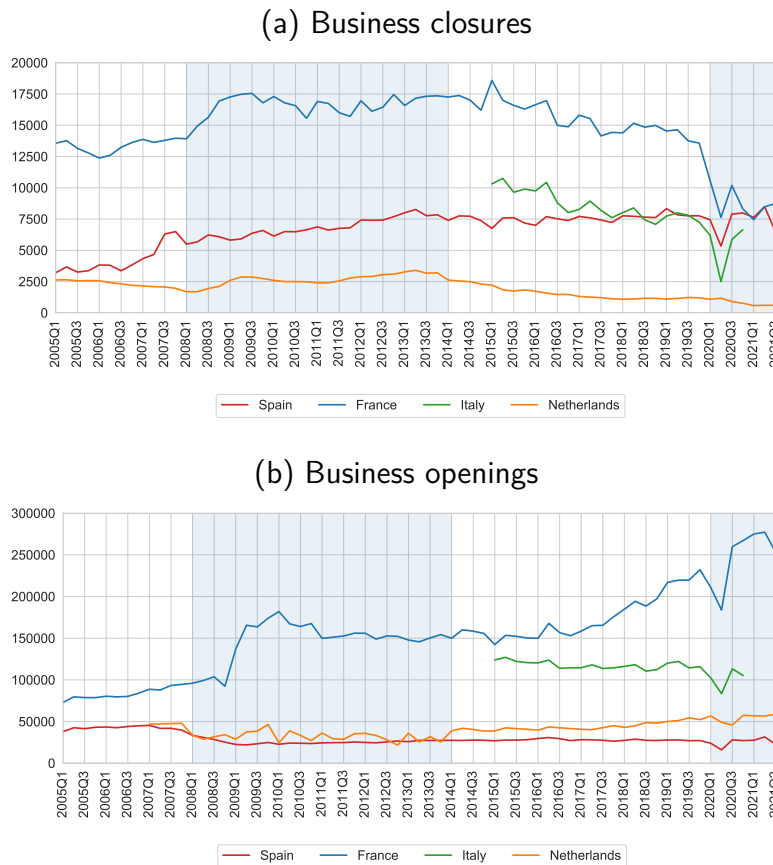
Source: Eurostat. The vacancy rate is vacancies / (vacancies + filled positions).

Figure 9 shows the vacancy rate for Spain, Italy and the Netherlands²⁹. Vacancy creation is not likely the explanation of the similarities between Spain and the Netherlands: the Spanish vacancy rate is rather low and suffers modest losses during COVID, while in the Netherlands there are large falls in 2020Q1. This might be explained partly by a stock-flow fallacy: a high new inflow of temporary vacancies that are taken quickly, and the measured level of reported openings are *persistent* vacancies that take longer to be taken up. In this case, the low vacancy rate of Spain compared to the Netherlands may be explained by the former being a much “faster” labour market than the latter. In Italy the vacancy rate also falls in the first quarter of 2020. Note that while the lack of new jobs in 2020Q1 and Q2 can explain delayed search of the unemployed, vacancies remained low in the third quarter, when we saw the flows from inactivity to unemployment.

Comparing Spain and the Netherlands, it may seem hard to reconcile the similar fall in the temporary job finding rate in both with the much more modest fall in vacancies in Spain. However, given the stock-flow fallacy and vacancy data being generally less reliable, firm dynamics can give

²⁹The vacancy rate is the number of reported open vacancies divided by the sum of open vacancies and occupied positions, and it is expressed in percentage points. This is a harmonised index that we obtained from Eurostat, which makes it comparable across countries. Unfortunately, there is no data available for France.

Figure 10: Registered business closures and openings (all countries)



Source: CBS, "Registro Mercantil" via INE, "Répertoire des entreprises et des établissements" via Insee and own elaboration with data from Eurostat.
Notes: Deseasonalised using a piece-wise linear trend.

us part of the answer. Figure 10 displays quarterly business closures and openings, for Spain, France, Italy³⁰ and the Netherlands. Some common pre-COVID patterns arise: business closures increased during the Great Recession, most suddenly for France and more steadily for Spain and the Netherlands. In all countries except for Spain business closures fell in the 2014-2020 recovery. In contrast, Spain never recovered the pre-recession level of firm exit. The upward trend peaking in 2013 mirrors the soft downward trend of permanent employment in figure 2. This is not a causal link but suggestive evidence that in Spain permanent workers lost their jobs when the firm had no choice but to close down.³¹

We now focus on the COVID period. In all countries there is a fall in business closures in the first quarter of 2020, indicating that firm support policies (STWs and others) worked. For France

³⁰Quarterly data for Italy is not available. To give a sense of business openings and closures we used business openings and closures indexed at 2015 provided by Eurostat. We then multiplied the index for business closures by 100 and the index for business openings by 1000. This series is only available from 2015 onward.

³¹Lafuente, Santaaulàlia-Llopis, and Visschers (2021) reach a similar conclusion, were the adjustment of employment in Spain is sudden for temporary workers but takes time to reach permanent workers.

and the Netherlands this fall is sustained until the end of 2021. The obvious potential downside of these policies is that some firms are being artificially kept alive by the extension of emergency measures, as suggested for Italy by [Giupponi and Landais \(2020\)](#). In this case we should expect some firm destruction as government help decreases. Indeed, this seems to be the case in Spain with a spike in the second quarter of 2021.

As for business openings, the countries have opposite patterns in the Great Recession: they go down in Spain and the Netherlands and up in France. This suggests that the Great Recession was a time for 'creative destruction' in France, which helped to keep unemployment low and flows to temporary jobs high, accelerating the recovery. In contrast, in Spain the monthly number of new firms *halves* by 2009 and never recovers to pre-recession levels. Together with the increase in business closures, this indicates that the recovery in Spain was driven by existing firms expanding employment, not new firms creating jobs. In the Netherlands business openings grow slowly back during the recovery and reach pre-recession levels in 2018.

COVID had a heterogeneous effect in business openings. On impact, they fall in all countries. In France, the drop on impact is large but firm openings recover very quickly, returning to the overall increasing pattern since 2017. The rebound is also visible in Spain, but business openings return to their flat, lower trend. In the Netherlands the initial fall is more modest and returns to its steadily increasing trend.

This may be the key explanation of the diverging patterns of temporary employment in these countries. As we saw, lower temporary job creation seems to be the main driver of the fall in employment and the increase in unemployment. Since new firms are more likely to hire workers on temporary contracts given the uncertainty in the market (increased business failures), the fall in business creation may explain why temporary flows did not recover in Spain, both during the Great Recession and COVID. However, this does not seem to be the case for the Netherlands in the latest recession, as the number of business openings stays rather stable. There it seems that vacancy openings from existing firms are the ones driving the fall in temporary job finding rate.

We leave further analysis for future work. It is clear, however, that more research is needed to disentangle the channels behind job creation in dual labour markets: both firm dynamics and replacement hiring are likely to play a major role, but both have been largely neglected in the dual-labour market literature.

5 Conclusion

In this paper we quantified, compared and analysed the impact of Short Time Work schemes (STWs) on labour market stocks and flows during the COVID crisis in four European countries. We did this by computing stocks and flows between employment, unemployment and non-participation, separating between permanent, temporary and self-employment.

We found that STWs successfully protected the jobs of permanent workers, as shown by the counterfactual stocks and flows where we artificially classified workers on a STW as inactive instead of employed. Considering these workers as inactive brings the losses of European employment in line with those observed in the US (i.e. hours suffered similar losses) as documented in [Gros et al. \(2021\)](#). STWs were, therefore, largely successful in preventing excessive turnover. However, temporary jobs were protected to a much lesser extent, especially in the Netherlands and Spain. This uneven protection exacerbates already existing inequalities in dual-labour markets. In terms of unemployment, we observe that France and Italy have a follow a similar pattern, peaking in second quarter of 2020, but eventually reverting back to trend. In Spain and the Netherlands unemployment keeps increasing compared to the trend after the initial lockdown. This can largely be explained by rises in temporary job destruction and decreases in temporary job creation, which did not fully recover in these countries after the initial lockdown shock.

On the participation margin, we found a pattern of delayed search in all four countries. Individuals who lost their job or were already non-employed did not search during the lockdown of spring 2020. Consequently, they were classified as inactive. When the lockdown ended, they started searching again and flowed back into unemployment. We do not observe a permanent increase in non-participation.

Finally, there is evidence of a failing job ladder when looking at flows from temporary to permanent employment. This happens in all four countries, but it is more pronounced in Spain and the Netherlands, which have a higher reliance on temporary contracts. We note that a fall in worker mobility can have severe consequences for workers' future earnings and jobs security, which makes this finding particularly concerning for policy makers.

Given the similarly adopted measures and labour market institutions, we briefly look into vacancy posting and firm creation to explain the disparities between countries. In particular, we document a large fall in vacancy creation reported in the Netherlands, which could explain the sustained fall in job-creation. Business closures went down, particularly in France, Spain and Italy. This is a direct reflection of economic support measures for firms. However, there are diverging patterns in firm creation, which recovered strongly in France and weakly in the Netherlands but falls in Spain. These contrasting firm dynamics may be able to explain some of the differences between France and Spain, both dual-labour markets.

Taken together, our findings show that European labour markets were generally successful at weathering the effects of the COVID pandemic in terms of employment loss, non-participation and unemployment. However, temporary workers bore a disproportionate share of the burden of the recession.

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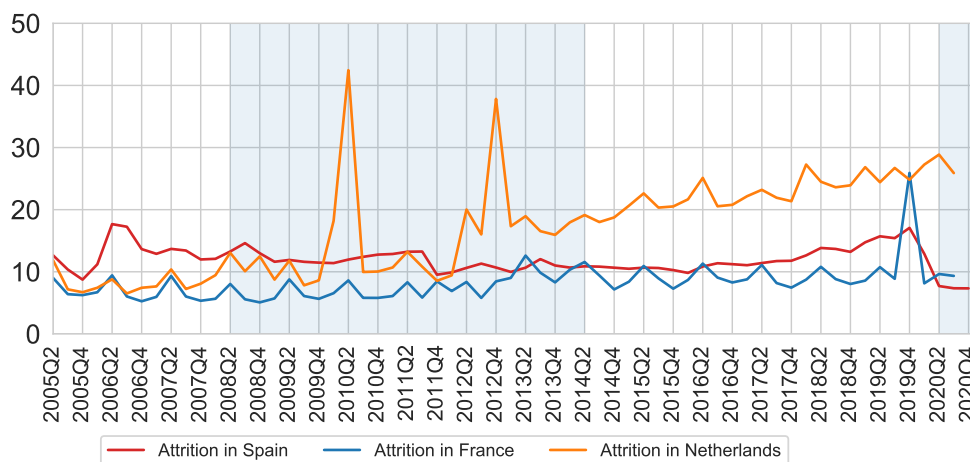
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Appendix

A LFS details and attrition

Figure 11 shows attrition, which we measure as the percentage of people in the sample (un-weighted) that missed an interview in the next quarter³². For France, there is a peak in people that are not responding in the first quarter of 2020, about 25% of the respondents in the sample missed an interview. This is not visible in Spain. Instead, in Spain there is a decrease in the number of people that are not responding for a certain quarter after the first quarter of 2020. This happened after a slow but steady increase in the percentage of respondents missing an interview over the last few years. In the Netherlands, attrition shows an increasing trend since 2018, which is not interrupted by COVID. In all four countries interview methods are similar, where the first

Figure 11: Attrition, for Spain and France



Source: Own elaboration with data from INE and Insee.

interview is usually a face-to-face interview. Thereafter, the interviewed household can choose to either take the interviews over the telephone or via internet. In Spain during COVID, the household could opt to do even the first interview over the phone instead of face-to-face. This was not the case in France, which might explain differences in attrition between the countries during this period.

Moreover, in 2010, the Dutch LFS switched from 100% in face-to-face interviews to partially face-to-face and partially phone interviews, also in the first interview round. In 2012 also web interviews were introduced. This might explain the increases in attrition at the beginning of 2010 and 2012 for the Netherlands. For reference, also Italy has a combination of face-to-face interviews and interviews over the phone.

³²This means if someone misses an interview in 2020Q1, this will show up in 2019Q4. This is because we compute flows forward, as explained in section 3.

A.1 How to recognise someone on STW in LFSs

In table 2 you can find the specific questions and answers we use to identify workers on STWs.

Table 2: Reasons for not working during the reference week while having a job

Spain	France	Italy
1. Holidays or paid leave	1. Paid leave	1. Redundancy fund (ordinary or extraordinary CIG)
2. Maternity leave (short)	2. Sick leave	2. Reduced business activity for economic and/or technical reasons (excluding CIG)
3. Maternity leave (long)	3. Maternity leave	3. Labour dispute
4. Sickness, accident or temporal incapacity	4. Part-time work	4. Bad weather
5. Flexible work arrangement	5. Parental leave	5. Illness, personal health problems, accident
6. Working for a worker's union	6. Other types of unpaid leave	6. Holidays
7. New job which has not started yet	7. Training paid by the employer or as part of a work-study or apprenticeship contract	7. Public holidays in the week
8. Seasonal work	8. Partial unemployment (or technical unemployment)	8. Variable or flexible hours (e.g. compensatory rest)
9. Bad weather	9. Layoff, end of employment period	9. Vertical part-time
10. Slack work for technical or economic reasons	10. Strike	10. Study or training not organized as part of one's work
11. Being under a "regulatory work arrangement"	11. Off-season period as part of a seasonal activity or period preceding the start of employment	11. Mandatory maternity leave
12. Strike action or labour conflict	12. Bad weather	12. Optional absence until the child's eighth year (parental leave)
13. Having received education/ training outside the workplace		13. Lack / shortage of work
14. Personal reasons or family duties		14. Does a casual job
15. Others		15. Does a seasonal job
		16. Other reason

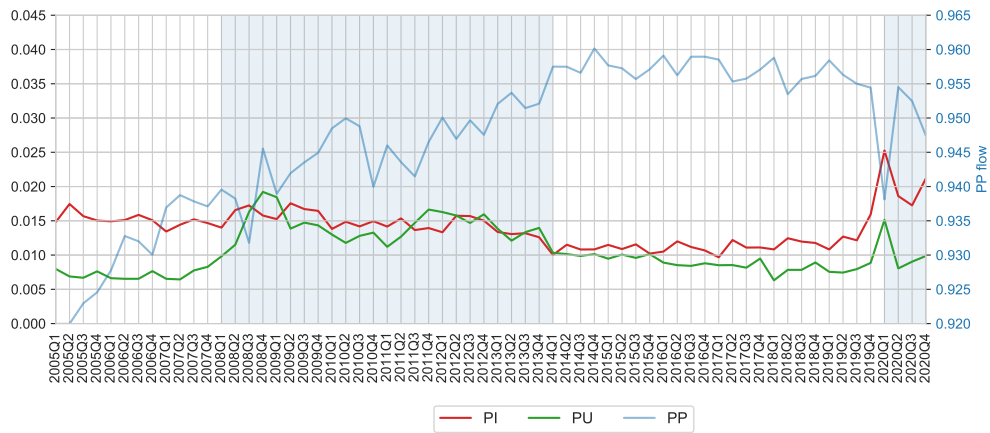
Source: LFS manuals provided by Insee, INE and Istat

B Raw labour market flows

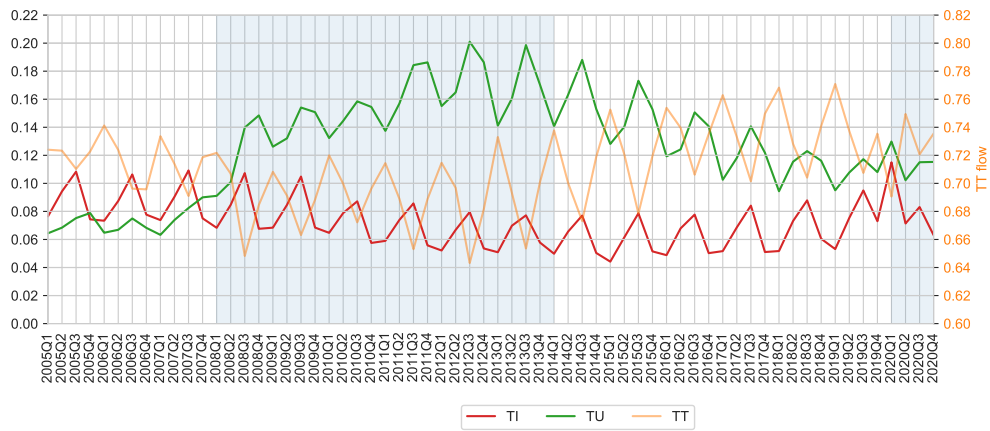
B.1 Spain

Figure 12: Labour Market Flows in Spain, 2005-2021

From Permanent Employment



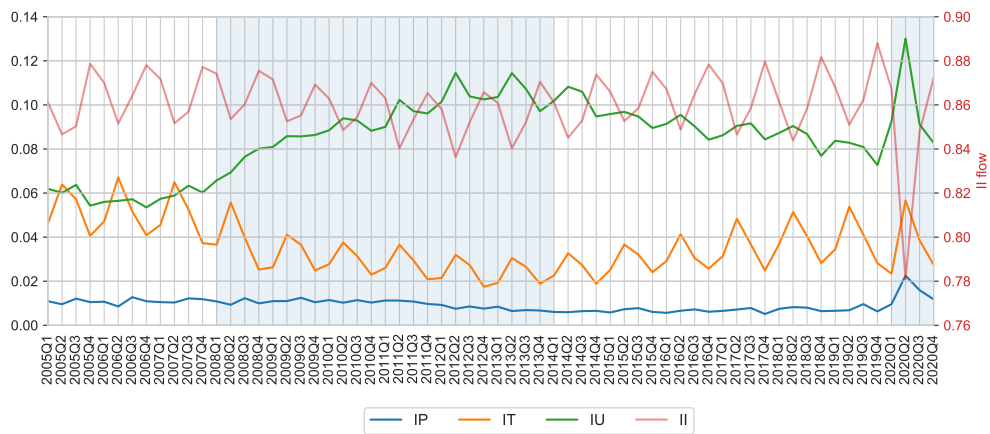
From Temporary Employment



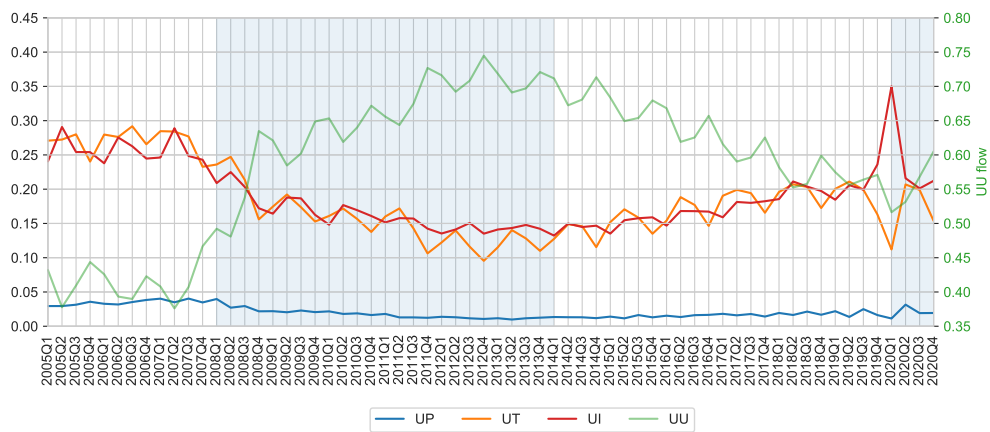
Source: Own elaboration with data from INE

Figure 13: Labour Market Flows in Spain, 2005-2021

From Non-Participation (Inactivity)



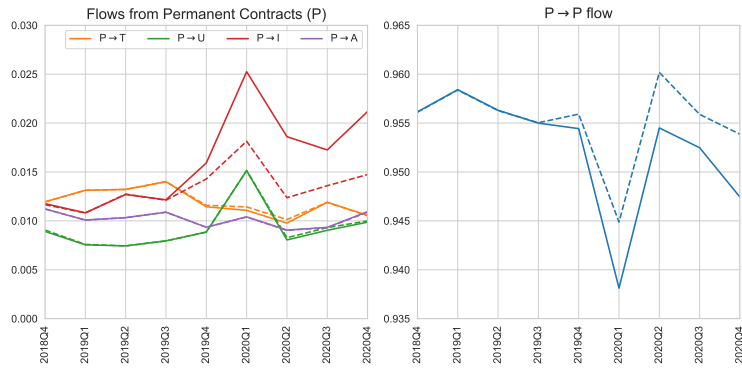
From Unemployment



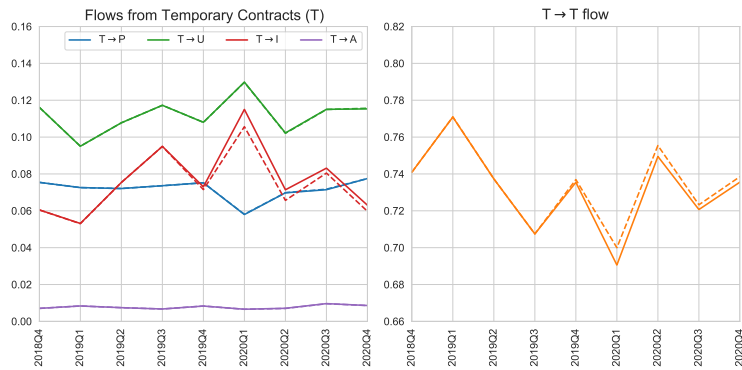
Source: Own elaboration with data from INE

Figure 14: Labour Market Flows in Spain, 2019-2021

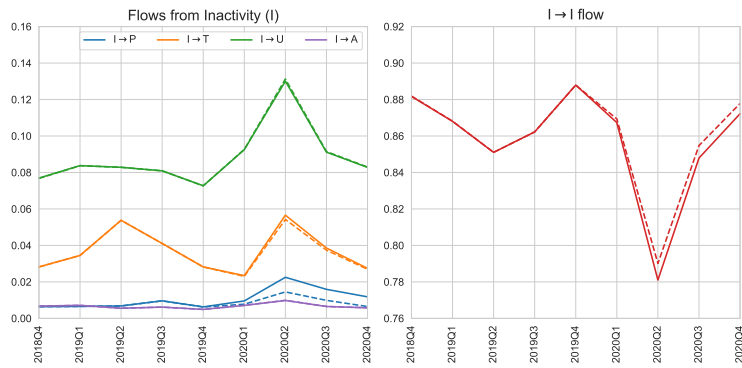
From Permanent Employment



From Temporary Employment



From Non-Participation (Inactivity)

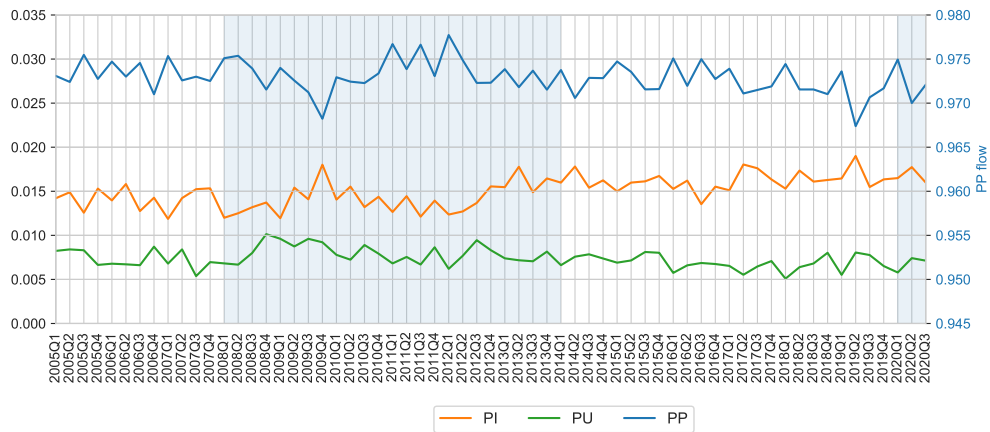


Notes: Dashed lines represent alternative flow measures where individuals in a STW scheme that are inactive are considered employed. Flows are defined forward $\frac{A_t \rightarrow B_{t+1}}{A_t}$
 Source: Own elaboration with data from INE

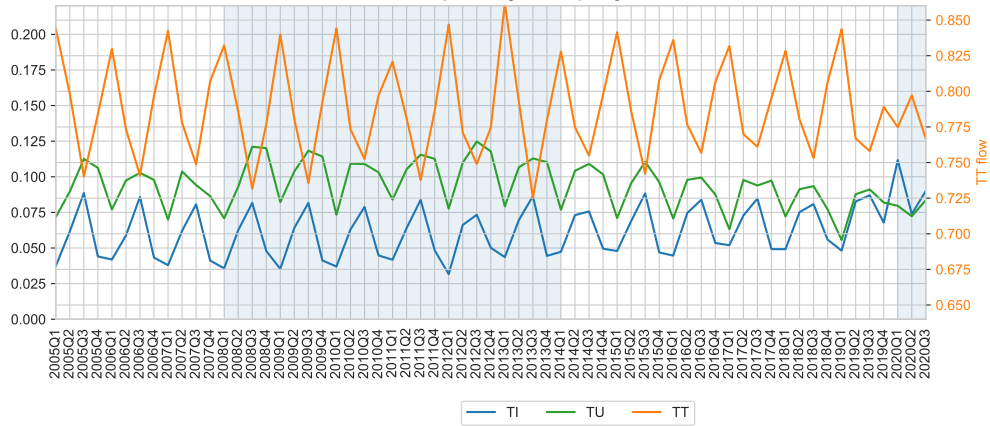
B.2 France

Figure 15: Labour Market Flows in France, 2005-2020

From Permanent Employment



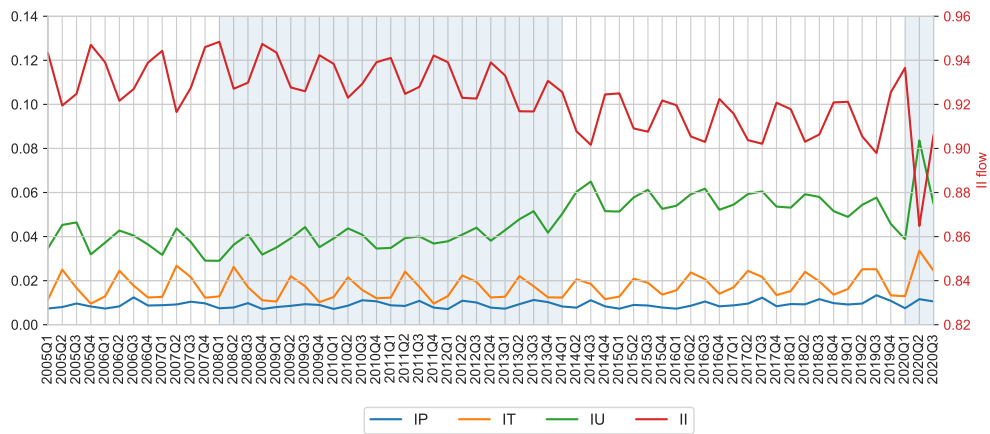
From Temporary Employment



Source: Own elaboration with data from Insee

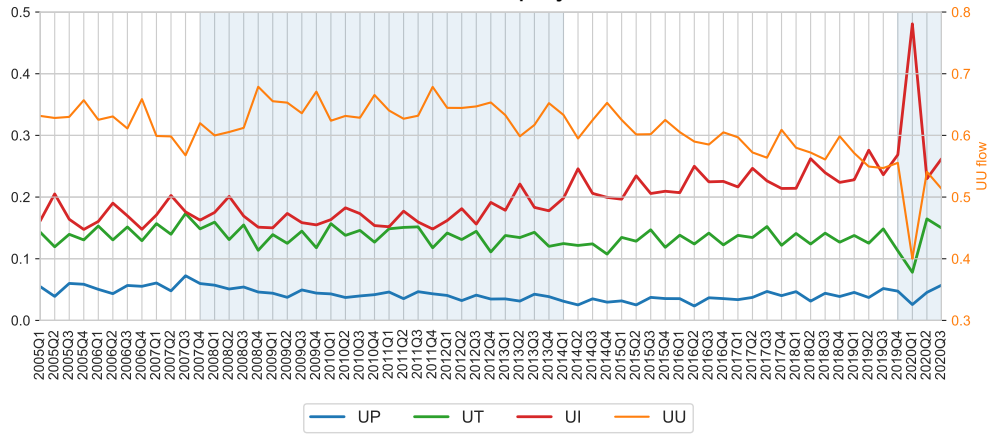
Figure 16: Labour Market Flows in France, 2005-2020

From Non-Participation (Inactivity)



— IP — IT — IU — II

From Unemployment

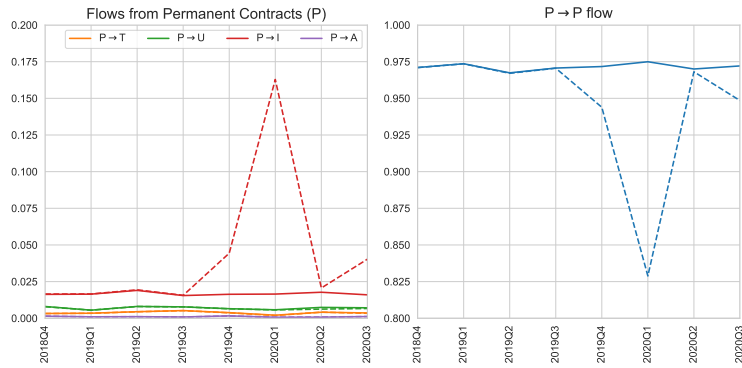


— UP — UT — UI — UU

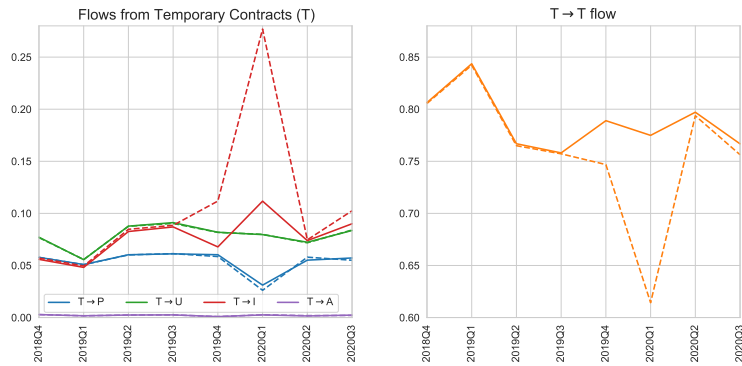
Source: Own elaboration with data from Insee

Figure 17: Labour Market Flows in France, 2019-2020

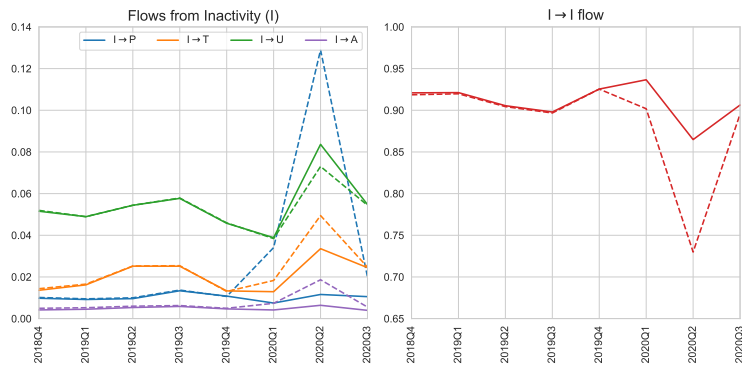
From Permanent Employment



From Temporary Employment



From Non-Participation (Inactivity)

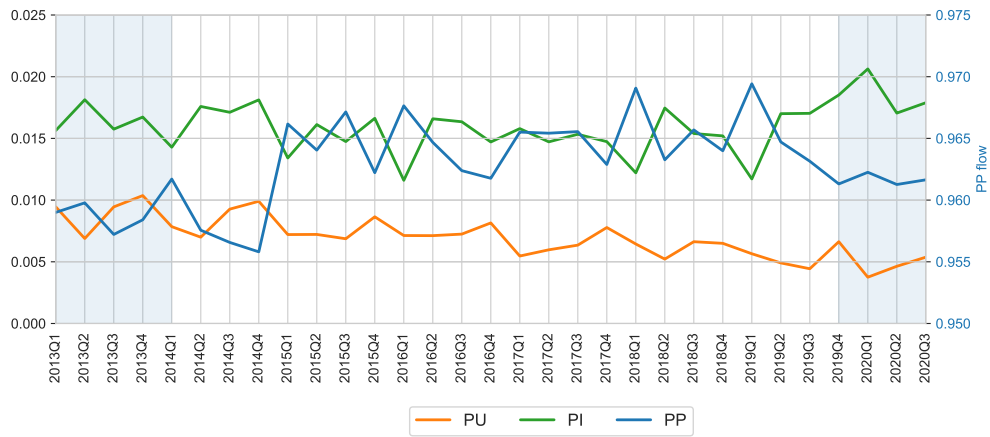


Note: Dashed lines represent alternative flow measures where individuals in a STW scheme are considered inactive. Flows are defined forward $\frac{A_t \rightarrow B_{t+1}}{A_t}$
 Source: Own elaboration with data from Insee

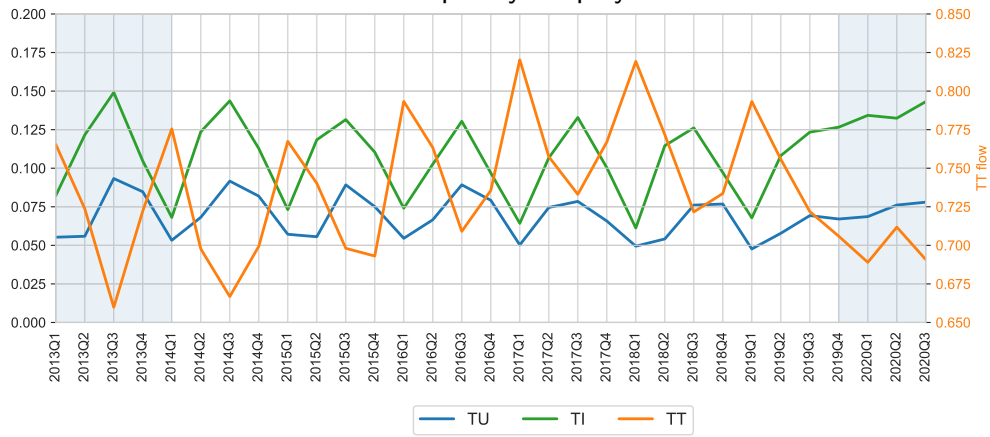
B.3 Italy

Figure 18: Labour Market Flows in Italy, 2013-2020

From Permanent Employment



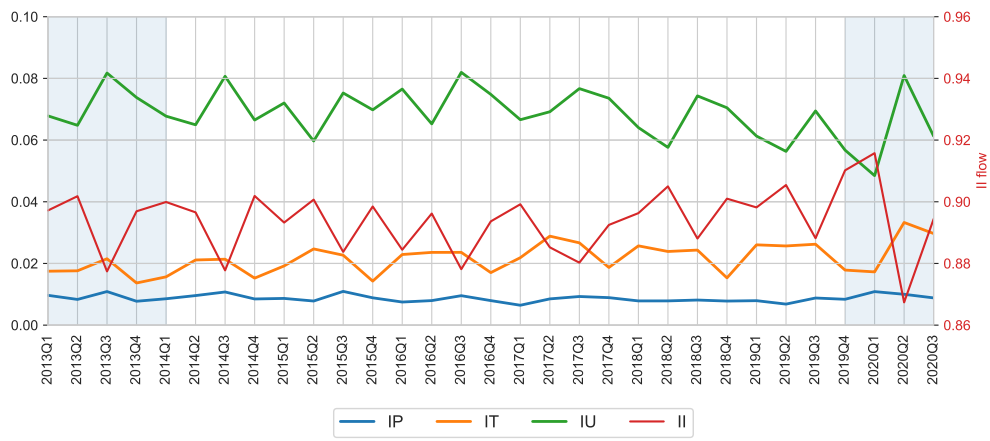
From Temporary Employment



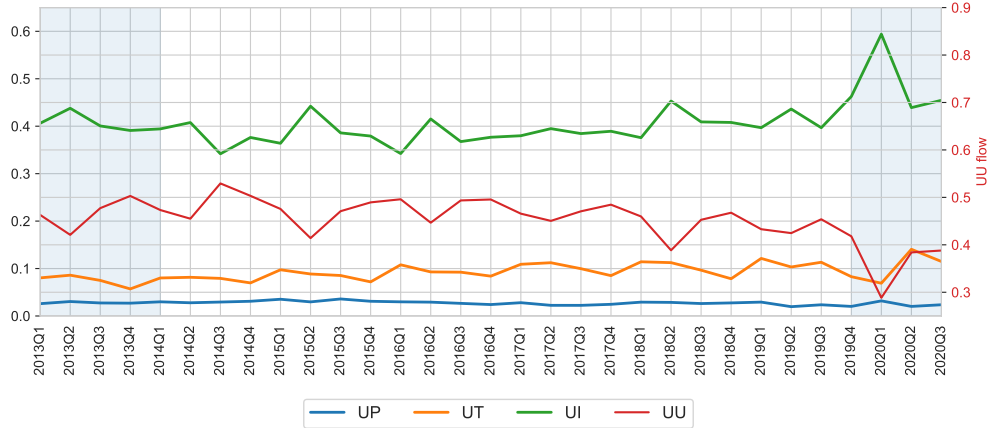
Source: Own elaboration with data from Istat

Figure 19: Labour Market Flows in Italy, 2013-2020

From Non-Participation (Inactivity)



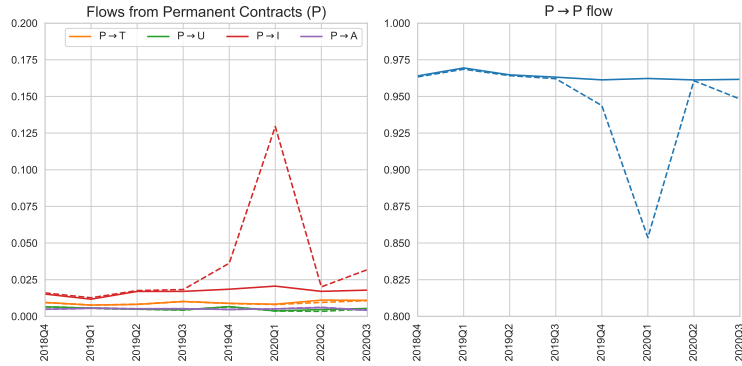
From Unemployment



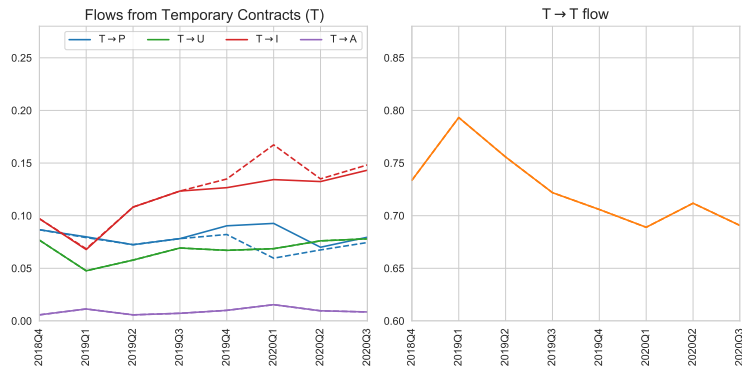
Source: Own elaboration with data from Istat

Figure 20: Labour Market Flows in Italy, 2019-2020

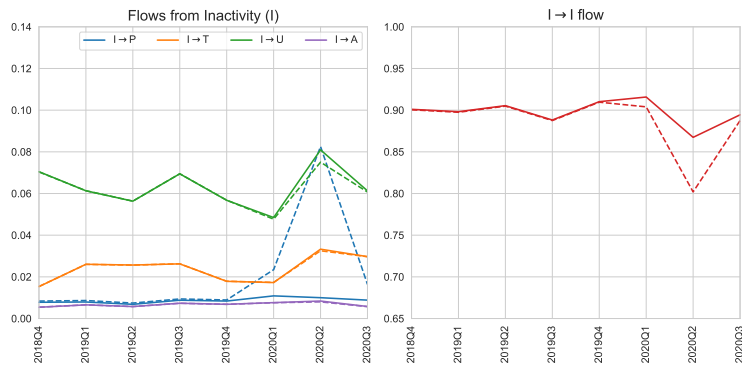
From Permanent Employment



From Temporary Employment



From Non-Participation (Inactivity)

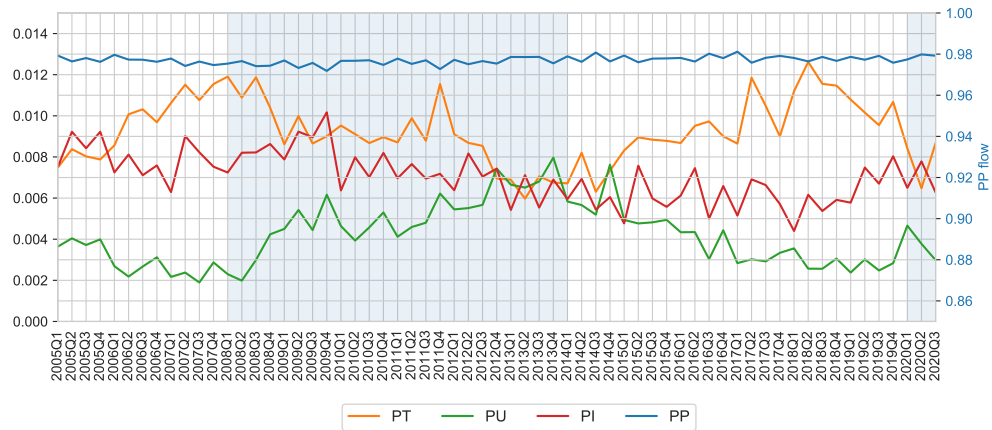


Note: Dashed lines represent alternative flow measures where individuals in a STW scheme are considered inactive. Flows are defined forward $\frac{A_t \rightarrow B_{t+1}}{A_t}$
 Source: Own elaboration with data from Istat

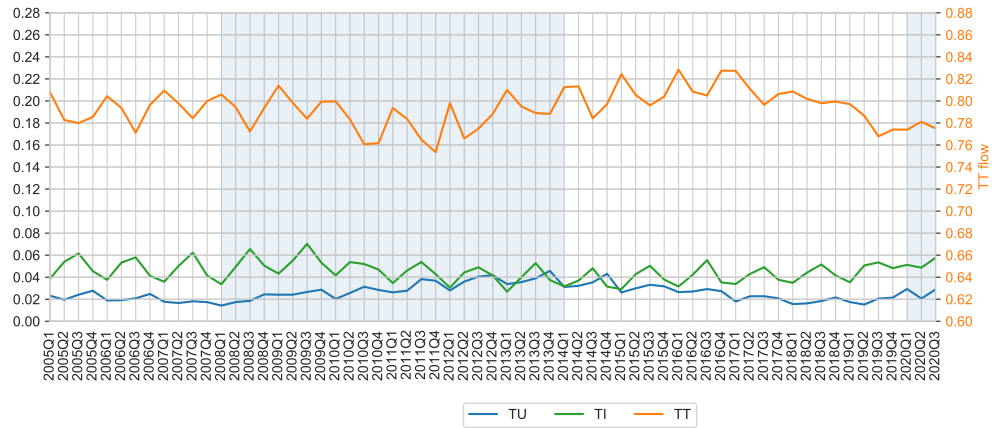
B.4 Netherlands

Figure 21: Labour Market Flows in Netherlands, 2005-2020

From Permanent Employment

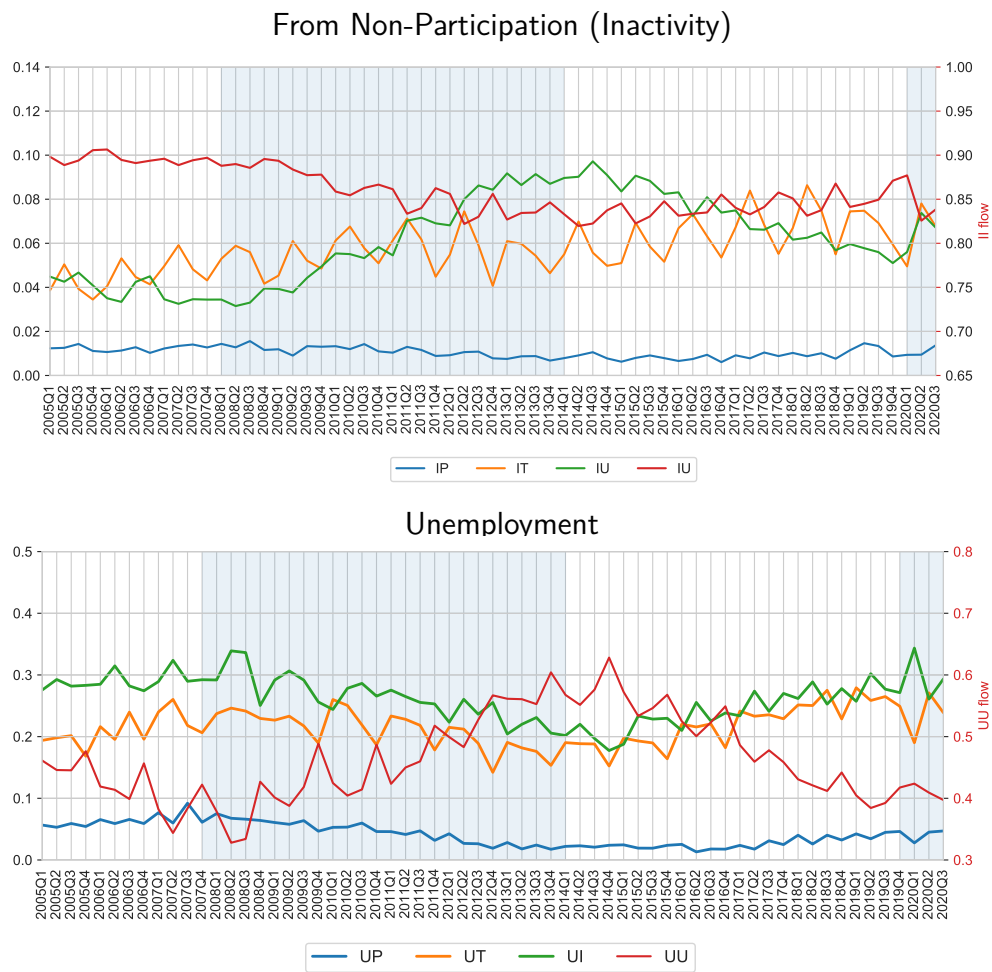


From Temporary Employment



Source: Own elaboration with data from CBS

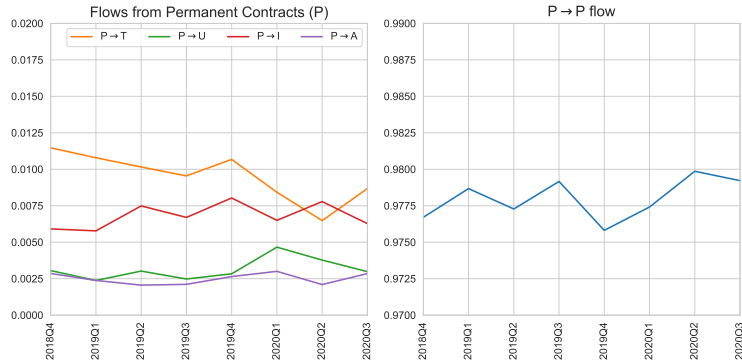
Figure 22: Labour Market Flows in Netherlands, 2005-2020



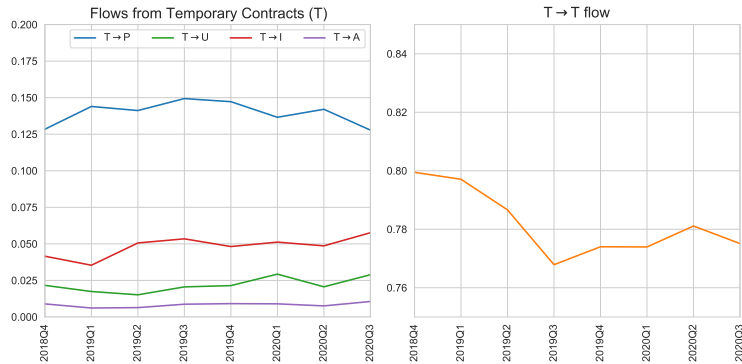
Source: Own elaboration with data from CBS

Figure 23: Labour Market Flows in Netherlands, 2019-2020

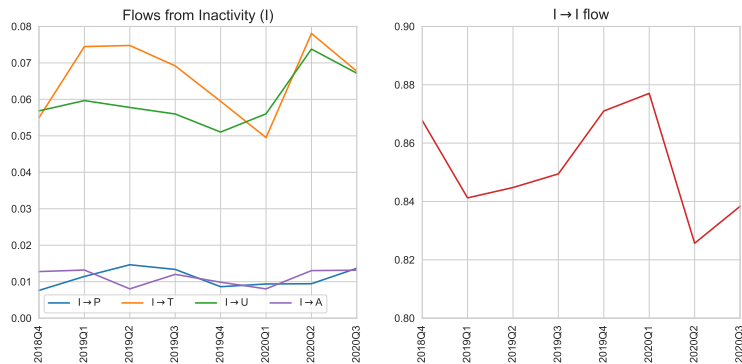
From Permanent Employment



From Temporary Employment



From Non-Participation (Inactivity)



Note: Flows are defined forward $\frac{A_t \rightarrow B_{t+1}}{A_t}$
 Source: Own elaboration with data from CBS

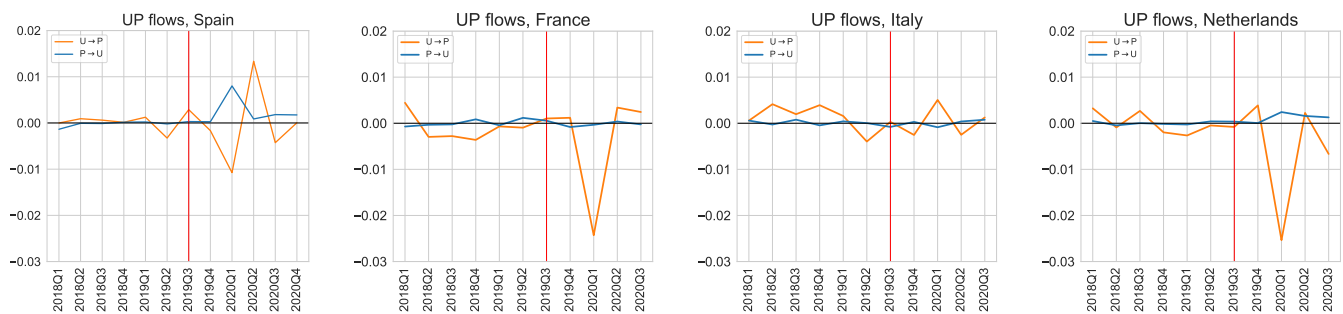
C Other flows

This appendix shows more flows omitted from the main text but referenced in section 3.

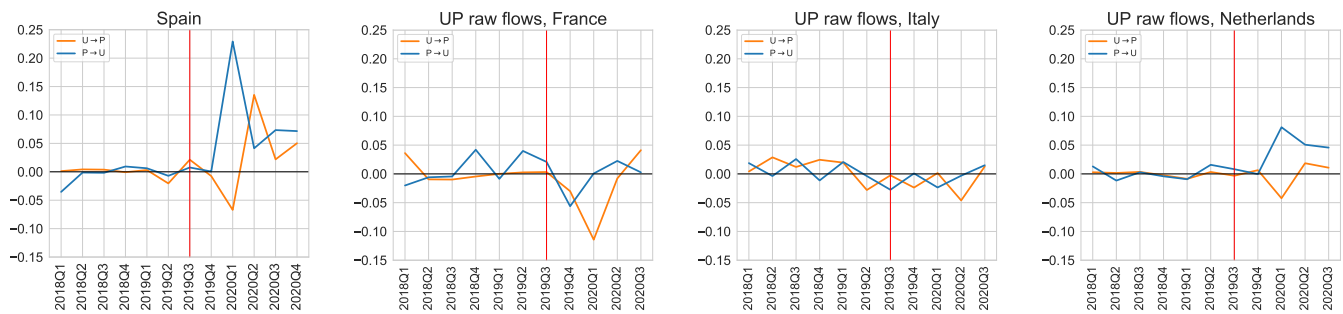
Permanent employment and unemployment

Figure 24: UP and PU flows, deviations from trend, all countries

(a) Relative flows (transition probabilities)



(b) Gross flows



Source: Own elaboration with data from CBS, INE, Insee and Istat

Figure 24a shows only a small spike in job loss (PU) in Spain and the Netherlands. However, there is a sharp drop in job creation (UP) in 2020Q1-2020Q2, in the Netherlands and France, and to a lesser extent in Spain. This is followed by a small recovery compared to trend in the consecutive quarter in France and the Netherlands, and a sharp bounce back in Spain. This suggests that there were some hiring decisions that were postponed during the lockdown in Spain. For the Netherlands and Spain the UP flow drops again below trend in 2020Q3, and in Spain it returns back to trend in the last quarter of 2020Q4.³³

In order to compensate for the increase in unemployment due to the job-loss and stop in job-creation, the job-creation in the next quarter has to compensate for both these dynamics driving unemployment up. Part b of figure 24 reports gross flows, which allows us to check this.

³³Recall that the sample period of Spain is one quarter longer (to 2021Q1) than the sample period of the other countries (to 2020Q4).

It becomes clear that this is not the case. The situation in Spain and the Netherlands is most comparable as the increase in permanent job creation has not compensated for the spike in the loss of employment of the previous period. In other words, there was a substantial increase in permanent job destruction that was not compensated during the recovery. One possible caveat of this statement might be that it is more likely for a worker to gain a permanent job through a promotion or a job change from a temporary job, so it could be the case that firms chose to promote more workers during the recovery to cover for the permanent jobs lost. This issue is addressed below in figure 8.

In France, we see a drop in both job-loss and job-creation. This means people who had a permanent job during the lockdown were able to keep it more often than according to the trend. However, people who were already unemployed, had a harder time finding a job. After the initial lockdown both UP and PU rose, where job creation recovers more steadily. Remarkably, Italy shows very different dynamics. There is almost no change visible in the PU flow, and there is even a small spike in the UP flow, which disappears in the 'raw' flows. The former might be due to the ban on layoffs. There were restrictions on (collective) dismissals in France and Spain as well, however, there was not an unconditional ban like in Italy.

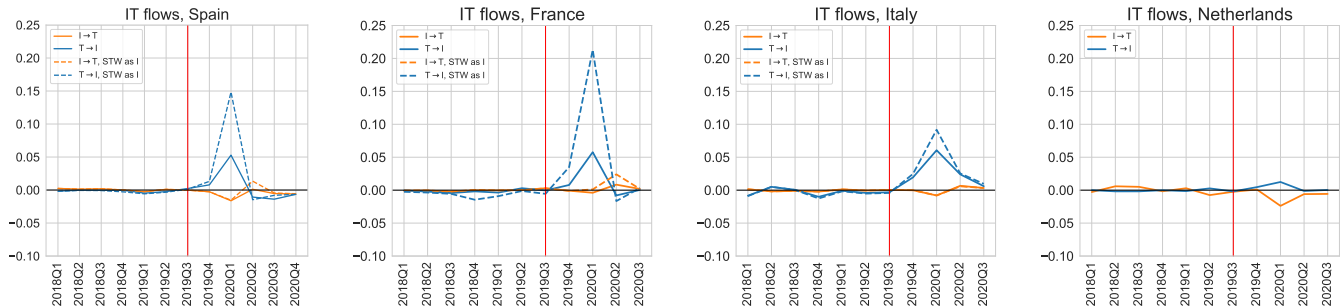
Temporary employment and inactivity

Figure 25 shows the flows between inactivity and temporary employment. Here we see similar patterns in all four countries. That is, there is an increase in the TI flow, in all four countries, most prevalent in Italy and least prevalent in the Netherlands. In addition, there is a decrease visible in the IT flow. This agrees with the evolution of the temporary stock in figure 4. One may conclude that job destruction was the main driver of this fall, but the gross flows of figure 25b show that in absolute terms the fall in job finding from inactivity was also quite substantial. Moreover, after the lockdown in the Netherlands, both the IT and the TI flow stay/drop below trend, freezing movements between inactivity and temporary employment. From this, we conclude that in all countries the increase in job-creation after the lockdown does not compensate for the initial job-loss.

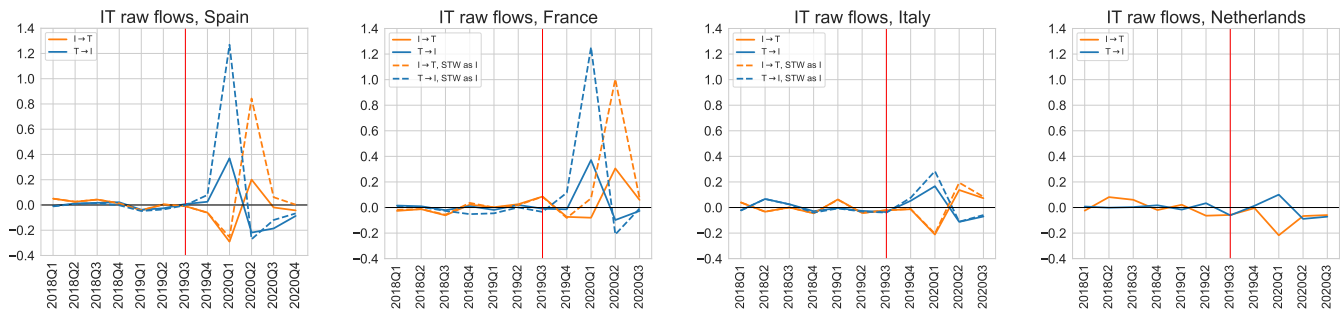
Figure 25 also shows the counterfactual series where everyone with a temporary contract who was on an STWs is classified as inactive. It becomes clear that some temporary jobs were saved. It shows that, considering the effect of STWs, the increase in 'job destruction' would have been more than 3 times as large as it really was in France and 2 times and 0.5 times as large in Spain and Italy, respectively. However, the relative difference between the real and the counterfactual flow is much smaller than for the $IP - PI$ flows. This is most evident in Italy, where only a small percentage of temporary jobs were saved by STWs. When looking at the gross flows in figure 25b, there exists also a spike in the quarter after the lockdown, where people on STWs revert

Figure 25: IT and TI flows, deviations from trend, all countries

(a) Relative flows (transition probabilities)



(b) Gross flows



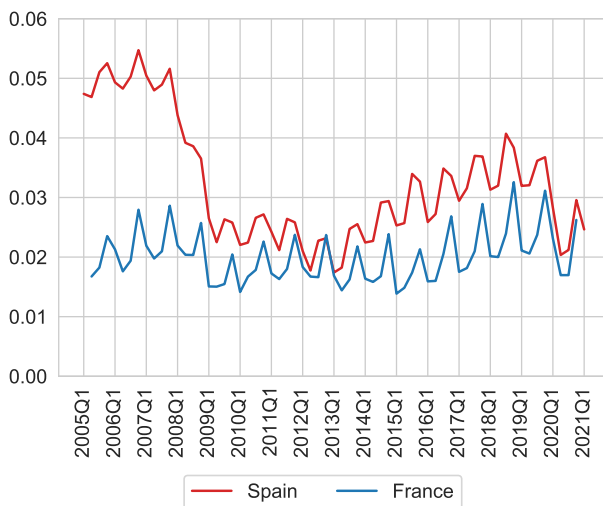
Source: Own elaboration with data from CBS, INE, Insee and Istat

back to temporary employment. This might not be so prevalent in the normal flows in figure 25, because the pool of inactive workers is relatively large compared to the number of people moving from inactivity to temporary employment. Therefore, a significant increase in the IT flow, will not show up as prevalent. In this case it is thus more useful to look at the gross flows in part b of figure 25.

D Job-to-Job Flows

Job-to-job transitions are hard to build using LFS data, because workers do not report a change in employer. However, using the self-reported tenure³⁴ we constructed series of job-to-job movements as share of all employed in a given quarter t that have lower tenure than 4 months and were employed in the previous quarter $t - 1$. This is possible for France and Spain, for Italy this information is not available in the longitudinal dataset.

Figure 26: Job-to-job share of EE flows



Source: Own elaboration with data from INE and Istat

Figure 26 shows share of the employed both at time t and $t + 1$ that switch employers between t and $t + 1$. So for example if this number is 0.05 at time t , then 5% of all employed workers at time t switched jobs at $t + 1$. Some of these workers will be recorded as a PT flow, some as TT and some as PP or TP , depending on their contract of origin. The purpose of this exercise is to know if all job switchers, not just the “contract switchers” (PT and TP) fell during the COVID recession.

Figure 26 displays this job switcher rate for France and Spain. In both countries the job switchers fell in the great recession, only recovering from 2013 onward in Spain and from 2016 in France. The fall in Spain is dramatic: the job-to-job rate *halves* in a year. The timing of the recovery in the job-to-job share coincides with the recovery in unemployment, a finding that echoes the results of recent literature highlighting the important role of replacement hiring and on-the-job search for unemployment dynamics (e.g. [Elsby, Michaels, and Ratner \(2020\)](#)). During COVID we can also appreciate a major fall in both countries, which reinforces our interpretation of a falling job ladder.

³⁴The question is “how long have you been employed at your current firm?” and measured in months.

Are these movements reflecting the *TP* and *PT* flows only? In the case of Spain, the *TP* and *PT* flows combined were between 14% and 16% of all job-to-job movements in figure 26, so most of this fall is actually explained by a fall in the job-to-job *between* the same type of contracts. This confirms our interpretation of the *TP* and *PT* flows – the job ladder slowed down during COVID. In fact, *TT* transitions alone account for more than 70% of all job-to-job flows in expansion and more than 80% in recession. Here is good to remind the reader that these are quarter-to-quarter flows, so there might be time aggregation issues: *TT* flows with a change of employers may represent short unemployment spells between temporary contracts. We are limited by the frequency of our data to disentangle these two, but there is evidence from administrative data that these short unemployment spells are substantial in Spain, particularly in the 2002-2008 period (see Lafuente (2020b)). The fall in the *TT* job-to-job share of figure 26 should then be interpreted with caution, as it may reflect an increase in the duration of unemployment between temporary jobs. In this case, it would be more adequate to call this a slowing down of the “job chain” rather than a stop of the “job ladder”.

E Sex disaggregated results

Figure 27: Detrended labour market stocks by sex, all countries



Source: Own elaboration with data from CBS, INE, Insee and Istat

Given the importance of flows in and out of inactivity in all four countries, it is worth examining the stocks separately for men and women. As women usually have higher shares of inactivity

and larger flows into and out of inactivity in, the results presented in the previous section could be driven by women's different response to the conditions of the labour market during the pandemic. Recent studies have pointed out, using time surveys, that women spent more time doing housework during the first lockdown (see for example [Farré et al. \(2020\)](#)) and, therefore, could be forgoing paid employment to tend to children and other dependents in times of need.

Figure 27 shows the stocks for Spain, France, Italy and the Netherlands, where the blue line represents women and the orange line represents men. Focus on the solid lines first, in all countries the blue and the orange line match each other closely. As expected, differences lie mostly in inactivity. However, the sign is opposite of what the working at home hypothesis would suggest. In Spain, France and the Netherlands, men recovered more slowly than women, meaning that their level of inactivity is still above trend in the fourth quarter of 2020, whereas it is below trend for women in the same quarter. Italy is the only country where this is not the case, and women have a higher share of inactivity at the end of 2020. This image is mirrored by temporary employment. To a small extent, this is also observed in unemployment. Finally, we like to point your attention to permanent employment. In Spain, it is men who lost more permanent jobs. However, in France, where permanent employment showed very little change, most of the drop in permanent employment that occurred, is suffered by women.

The dashed lines in figure 27 represent the stocks where everyone on STWs is counted as inactive. The big spikes in inactivity and drops in employment seem to be almost the same for men and for women in both countries. These result indicate that there was almost no difference in the usage of STWs between men and women. The sub-section below shows the results for labour market flows in more detail. We find no large differences there either. Hence, we find small but no substantial differences between men and women and leave a more in depth analysis to further research.

E.1 Other sex-disaggregated results

Figure 28: Labour Market Stocks in Spain by sex, 2005-2020

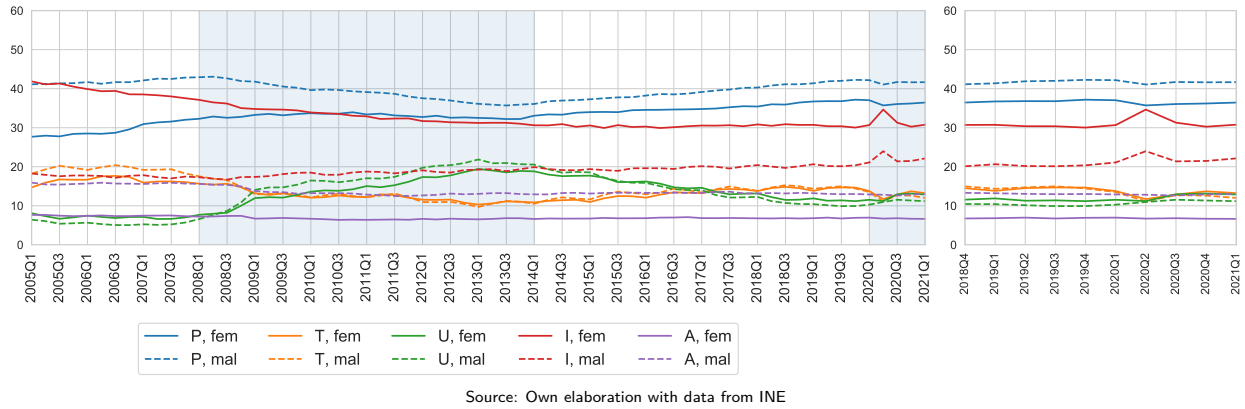


Figure 29: Labour Market Stocks in France by sex, 2005-2020

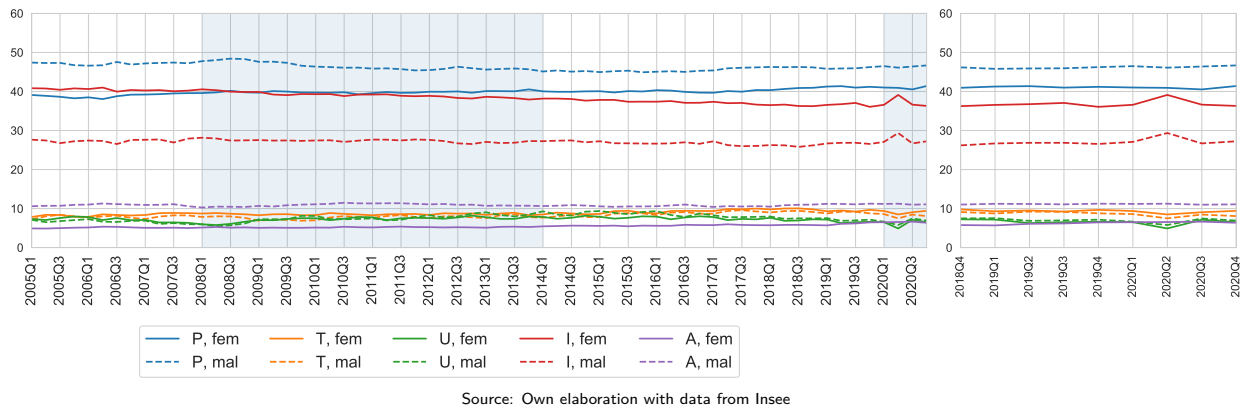


Figure 30: Labour Market Stocks in Italy by sex, 2005-2020

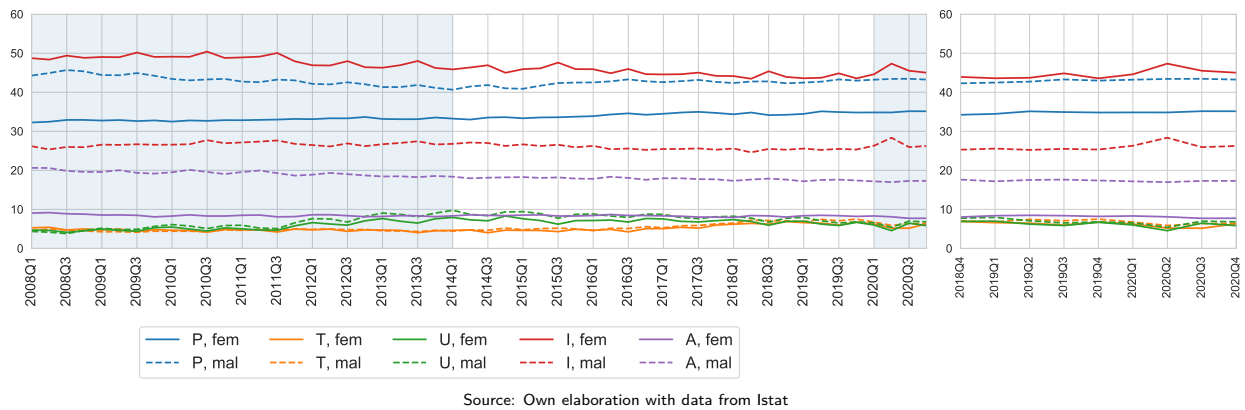
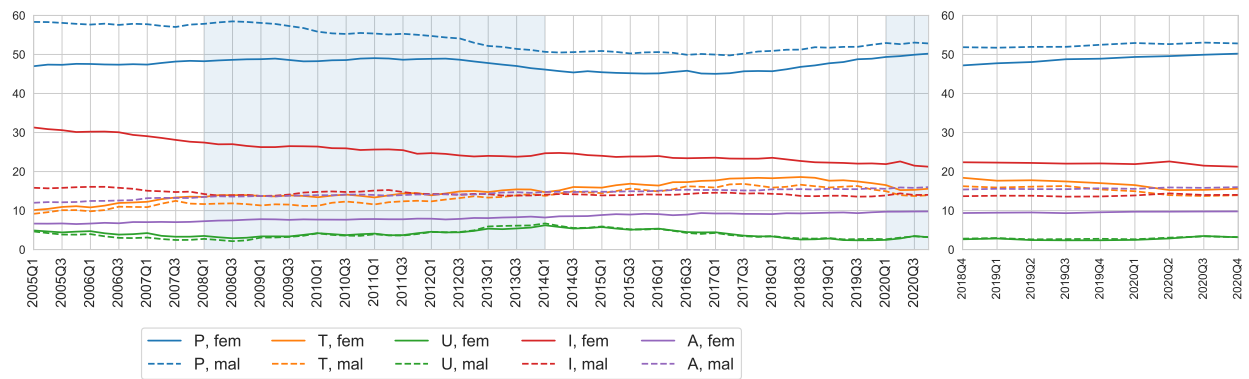


Figure 31: Labour Market Stocks in Netherlands by sex, 2005-2020



Source: Own elaboration with data from CBS

F Sex disaggregated results, deviations from trend

F.1 Spain

Figure 32: Relative labour market flows by sex, deviations from trend, Spain



Figure 33: Gross labour market flows by sex, deviations from trend, Spain



F.2 France

Figure 34: Relative labour market flows by sex, deviations from trend, France

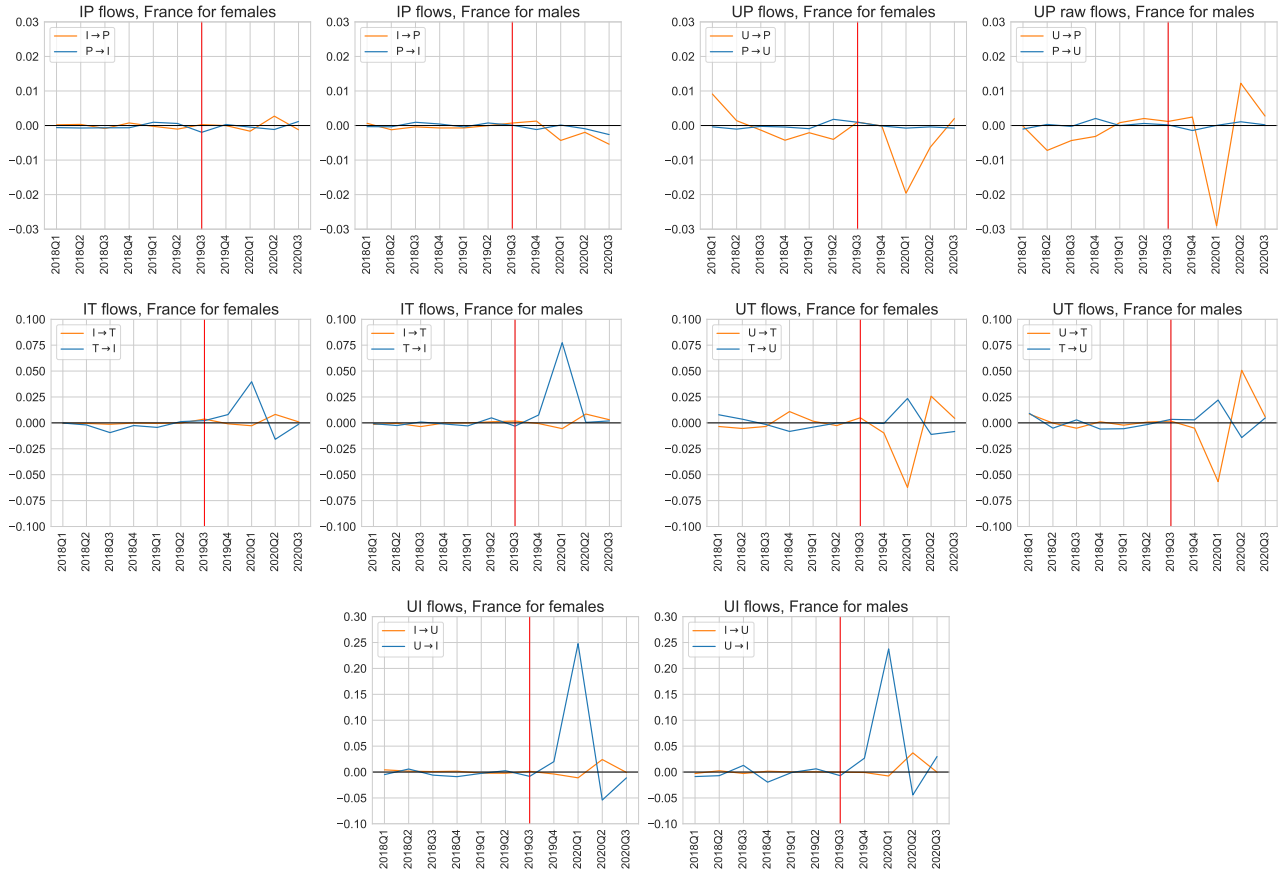


Figure 35: Gross labour market flows by sex, deviations from trend, France

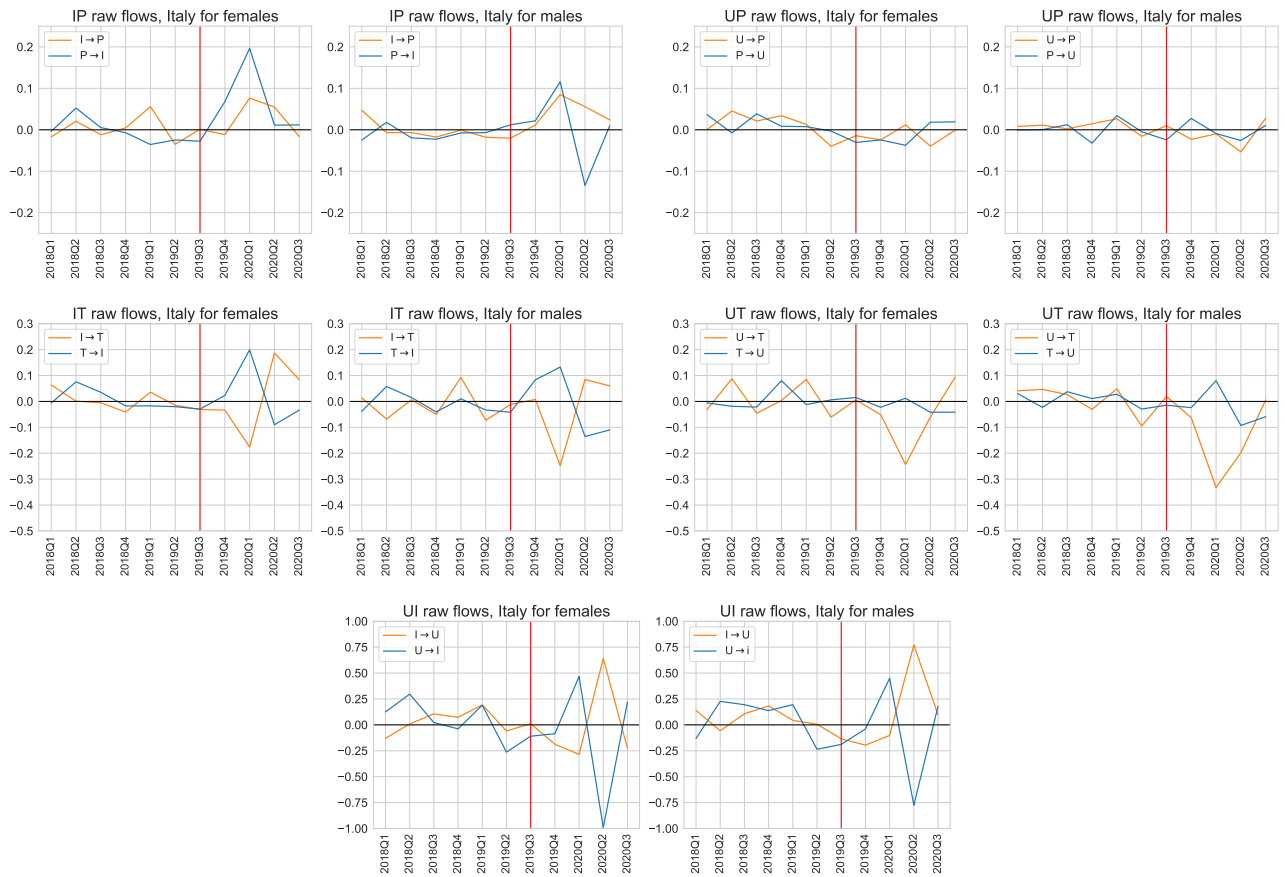


F.3 Italy

Figure 36: Relative labour market flows by sex, deviations from trend, Italy



Figure 37: Gross labour market flows by sex, deviations from trend, Italy



F.4 Netherlands

Figure 38: Relative labour market flows by sex, deviations from trend, Netherlands



Figure 39: Gross labour market flows by sex, deviations from trend, Netherlands

