N° 522-523 - 2021

Economie ET Statistique

Economics AND Statistics

Varia

TVA, niveau de vie et inégalités - Chômage et comportements à risque - Emploi des jeunes en Italie après la crise de 2008 - Disparités spatiales de l'autonomie résidentielle des jeunes en France - Désynchronisation du sommeil dans les couples

VAT, standard of living and inequality - Unemployment and risky behaviours - Youth employment in Italy after the 2008 crisis - Spatial disparities in young adults early residential independence France - Desynchronisation of sleep within couples

Insee

Economie ET Statistique

Economics AND Statistics

Directeur de la publication / Director of Publication:
Jean-Luc TAVERNIER
Rédactrice en chef / Editor in Chief:
Sophie PONTHIEUX
Responsable éditorial / Editorial Manager: Pascal GODEFROY
Assistant éditorial / Editorial Assistant: ...
Traductions / Translations: RWS Language Solutions
Chiltern Park, Chalfont St. Peter, Bucks, SL9 9FG Royaume-Uni
Maquette PAO et impression / CAP and printing: JOUVE
1, rue du Docteur-Sauvé, BP3, 53101 Mayenne

La revue est en accès libre sur le site **www.insee.fr**. Il est possible de s'abonner aux avis de parution sur le site. La revue peut être achetée sur le site **www.insee.fr**, rubrique « Services / Acheter nos publications ». La revue est également en vente dans 200 librairies à Paris et en province.

The journal is available in open access on the Insee website **www.insee.fr.** Publication alerts can be subscribed on-line. The printed version of the journal (in French) can be purchased on the Insee website **www.insee.fr**.

INSTITUT NATIONAL DE LA STATISTIQUE ET DES ÉTUDES ÉCONOMIQUES
Directeur Général : Jean-Luc TAVERNIER
Direction Générale : 88, avenue Verdier, CS 70058, 92541 MONTROUGE Cedex
Tél : +33 (0)1 87 69 50 00

N° 522-523 - 2021

Economie ET Statistique

Economics AND Statistics

Economie et Statistique / Economics and Statistics

Issue 522-523 – 2021

VARIA

Medium-Term Effects of a Rise in VAT on Standard of Living and Inequality: a Microsimulation Approach

Mathias André* and Anne-Lise Biotteau**

Abstract – A rise in VAT has both direct and delayed effects on standard of living and inequality. Such a rise translates into an increase in prices that same year. Earnings and other types of income are partly adjusted subsequently. The scales for social security benefits and direct taxes are also index-linked to inflation. This work offers an *ex-ante* evaluation of these mechanisms using the INES microsimulation model. Three years after a three-point rise in the standard rate of VAT, the standard of living, adjusted for VAT and spending on rent, would be 0.6% lower in real terms, on average, than if there had been no rise. This delayed effect equates to 45% of the initial effect. The poorest 10% of people suffer a relative fall in their adjusted standard of living three times greater than the rest of the population.

JEL Classification: H23, H24, H31, I32
Keywords: VAT, inflation, consumption, inequality, poverty, microsimulation

**INSEE (mathias.andre@insee.fr); **INSEE at the time of writing this paper (anne-lise.biotteau@travail.gouv.fr)*
The authors would like to thank Didier Blanchet, Béatrice Boutchenik, Clément Carbonnier, Chantal Cases, Maëlle Fontaine, Laurence Rioux, Sébastien Roux, Jean-Luc Tavernier, Xavier Timbeau and Lionel Wilner for their comments and careful proofreading, as well as the team from the DREES Redistribution & Evaluation Unit, participants at INSEE's DSDS and D2E seminars and at the DREES seminar and finally two anonymous reviewers.
Received in March 2019, accepted in February 2020. Translated from the original version *"Effets de moyen terme d'une hausse de TVA sur le niveau de vie et les inégalités : une approche par microsimulation"*

Citation: André, M. & Biotteau, A.-L. (2021). Medium-Term Effects of a Rise in VAT on Standard of Living and Inequality: a Microsimulation Approach. *Economie et Statistique / Economics and Statistics*, 522-523, 5–21. https://doi.org/10.24187/ecostat.2021.522d.2037

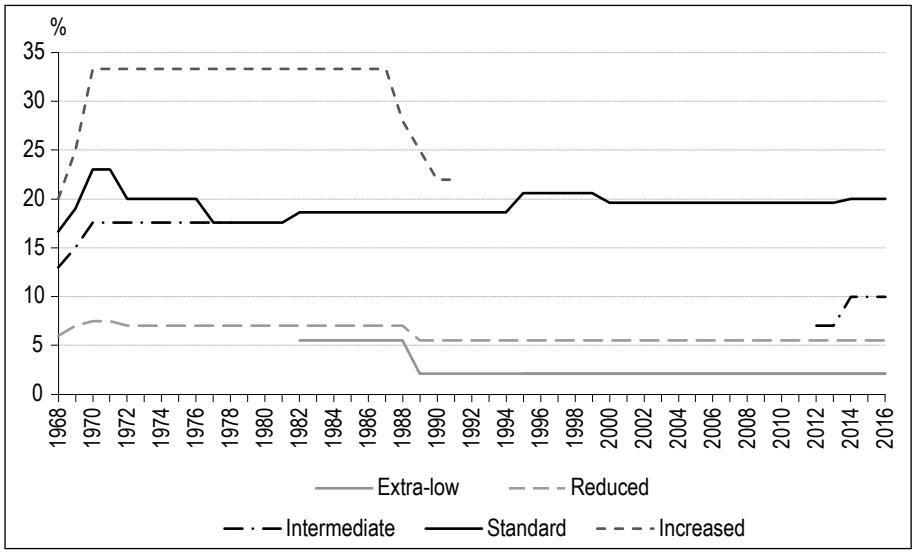
In France, the public debate on taxes is strewn with recurring subjects, one of the most symbolic being the income tax. However, over the last thirty years, the budgetary significance of this tax has reduced: its share in total social security and tax levies fell from 12% in 1981 to less than 7% at the start of the 2000s (André & Guillot, 2014), and has hovered between 6% and 7% ever since. This reduction has been accompanied by a switch from tax revenue towards two social contributions (the CSG, *Contribution Sociale Généralisée* – created in 1990 and the CRDS, *Contribution au Remboursement de la Dette Sociale* – created in 1996, aimed to reduce social security debt) accounting for a rise in the share of social security and tax levies, from 3% in 1996 to 10% in 2016 and even 13% in 2018, following the reform to switch part of the funding for social welfare from social security contributions to the CSG. But in fact, tax revenue depends largely on indirect consumption tax, principally Value Added Tax (VAT). VAT revenue alone represents about 16% of total social security and tax levies, with this proportion remaining stable since the 1990s. Unlike income tax, for which only 45% of tax households were liable in 2016, VAT is a tax paid by the entire population of consumers, including tourists and foreigners living in France.

This tax, which is central to tax revenues, was created by Maurice Lauré and first introduced in France in 1954. Since then, its structure has evolved on numerous occasions, owing to changes in the rates paid, tax bases and number of separate rates (see Figure I for the history of VAT rates since 1968). The latest change to date was introduced on 1st January 2014, having been passed in 2012 within the context of the Draft Finance Bill, raising the intermediate rate from 7% to 10% and the standard rate from 19.6% to 20%.[1] The standard rate applies to products and services not subject to any other specific taxes, i.e. the majority of goods and services. In the European Union, this standard rate differs by country: in 2016, it ranged from 17% (in Luxembourg) to 27% (in Hungary), standing between 20% and 23% in most Member States. Total tax revenue derived from VAT also differs, representing an average of 6.8% of GDP in OECD countries in 2016, varying from 0% in the USA – where there is strictly speaking no VAT but local retail sales taxes instead – to 9.4% in New Zealand. In Germany or in France, it represents 6.9% of GDP.

Furthermore, in the last decade, "Social VAT" plans, meaning a rise in VAT rates with revenue being allocated to social welfare, have fuelled debate about tax-benefit reforms (Besson's report, 2007; Fève *et al*., 2010; Carbonnier, 2012). The European institutions are seeking, then, to standardise Member States' VAT structures, notably by regulating the number of separate rates and setting minimum standard and reduced rates. However, standardisation of rates by means of European regulations is incomplete and the Court of Justice of the European Union regularly issues rulings on the matter to clarify the application of Council directives (*Conseil des prélèvements obligatoires* – CPO, 2015). Lastly, recent rises in VAT in Europe show

1. The expected additional revenue was estimated to be €5.2 billion. See the Finance Bill for 2014 (2013).

Figure I – **History of VAT rates in Metropolitan France**



Sources: Gilles & Fauvin (1996) for the years 1968-1995.

this to be a mechanism that is frequently used in times of budget consolidation (Gautier & Lalliard, 2013).

A change to the structure of VAT has budget consequences and an effect on household purchasing power. The redistributive nature of the tax-benefit system is assured both by levies (direct and indirect taxes and social security contributions) and by welfare benefits (family allowances, housing benefits, statutory minimum allowances, etc.). But the disposable income used by INSEE for studies on inequality and redistribution, is not measured net of indirect taxes such as VAT, and therefore is not well suited to assess their redistributive effects.[2]

Recent literature, however, has documented the redistributive effects of indirect taxes, both in the short term (Boutchenik, 2015) and the long term, i.e. over the lifecycle (Georges-Kot, 2015). In cross-section, VAT is regressive, with a burden-to-income ratio (i.e. amount of tax paid in proportion to disposable income) of over 12% for households in the bottom 10% of the standard of living distribution, compared with 5% for those in the top 10% (Boutchenik, 2015), primarily because the savings rate increases with income (Garbinti & Lamarche, 2014). When studying income over the entire lifecycle, regressivity would be less pronounced, as savings are a form of deferred consumption, thus resulting in payment of VAT.

But to the best of our knowledge, the medium-term distributive effects of a rise in VAT have not yet been investigated, effects which, on the face of it, are ambiguous since the short-term regressive effect is followed by medium-term adjustment mechanisms. The first repercussions from a rise in VAT rates are on consumer prices, entailing, on the one hand, a rise in the amount of VAT paid and, on the other, an increase in inflation. This general price rise is subsequently accompanied by an adjustment in earnings, particularly at the bottom of the wage distribution, and in the scales for social security benefits and direct taxes because they are index-linked. These delayed effects pass through three main channels:

- Wage adjustments, due on the one hand to the annual increase in the national minimum wage (SMIC, *Salaire minimum interprofessionnel de croissance*) which is directly linked to inflation, and its knock-on effect on higher wages, and on the other, to wage negotiations;

- Adjustment in tax-benefit scales and in some income replacement benefits, based on statutory or usual criteria for indexing them to inflation;

- The time lags caused by French legislation, since tax paid in year *N*+1 relates to income received in year *N* and some benefits and allowances received in year *N*+2 are also means-tested on the basis of income received in year *N*.

Consequently, the impact of a change in VAT rates will not be the same for all households, since this impact depends on the composition of their disposable income and their position in the distribution of standard of living. The short-term anti-redistributive effect might thus be partly counterbalanced by some medium-term redistributive effects.

The objective of this paper is to quantify the direct effects as well as some of the delayed effects caused by the adjustment in income and index-linking of tax-benefit scales to the inflation shock, following a rise in VAT. We use the INES[3] microsimulation model, based on data representative of the resident population of Metropolitan France in 2016 and, in particular, its indirect taxation module, which allows imputation of consumer spending in the ERFS (*Enquête sur les revenus fiscaux et sociaux*, a household income and tax survey) derived from the 2011 Household budget survey (*Enquête Budget de famille,* BDF) and simulation of rises in VAT (André *et al*., 2016).

This paper first reviews the short- and medium-term effects that, in theory, are expected from a rise in VAT. We present the literature on the transmission of VAT increases to prices and on the resulting adjustment in wages and income, as well as the legislation regarding the French tax-benefit system and index-linking of the related scales. The second section focuses on the microsimulation methodology, the data used and our main assumptions. An assessment of the effects of a rise in VAT on the main components of household disposable income and standard of living and on the main indicators of inequality is given in the third section; a sensitivity analysis of the results to the assumptions is available in the Online Appendices.[4]

---

2. See André et al. *(2017). In National Accounts, indirect taxation is included in prices and therefore taken into account when measuring the purchasing power of gross disposable income.*

3. The INES model simulates the effects of French tax-benefit legislation; for detailed documentation, see https://www.insee.fr/fr/information/2021951

4. Link to the Online Appendices at the end of the paper.

1. Effects of a Rise in VAT are A Priori Ambiguous

1.1. The Regressive Nature of VAT in Cross-Section

VAT, relative to income, is anti-redistributive: the VAT burden-to-income ratio decreases with standard of living. While estimates of VAT burden-to-income ratio by decile differ slightly depending on the data used, calculation methods and years taken into consideration, the finding is always the same: the poorest individuals devote a greater proportion of their income to VAT than the most affluent.

Forgeot & Starzec (2003) estimate a VAT burden-to-income ratio (VAT paid relative to gross disposable income – i.e. before tax deductions) of 8.1% for the poorest 10% of the population and 3.4% for the most affluent 10%, whilst Trannoy & Ruiz (2008) conclude that the burden-to-income ratios are 11.5% and 5.9%, respectively.[5] Based on similar data and method to those we use but for a different year, the CPO estimated that, on average in 2015, the poorest 10% of the population allocated 12.5% of their disposable income to VAT, compared with 4.7% for the most affluent 10% (Boutchenik, 2015). We estimate a VAT burden-to-income ratio (relative to disposable income) of 13.1% in 2016 for the poorest 10% of the population and 7.4% for the most affluent 10%. In cross-section, VAT therefore contributes to less progressivity in the tax-benefit system (see André & Biotteau, 2019a, for a breakdown of standard of living adjusted for VAT and spending on rent).

1.2. Transmission of a Rise in VAT to Prices

A rise in indirect taxation, particularly VAT, proportionate to the value of goods and services excluding tax (known as an *ad valorem* tax) affects consumer prices. Depending on the retailers' behaviour as regards price adjustments, a change in indirect taxation often has a significant effect on prices.

The transmission rate of a rise in VAT to prices, measured as the price rise observed (controlling for other sources of price changes) relative to the "automatic" price rise in the case of full transmission is calculated as being between 70% and 80% on average (Carare & Danninger, 2008; Gautier & Lalliard, 2013). Gautier & Lalliard (2013) thus estimate that the creation in 2012 of the intermediate rate of 7% for certain products (compared with a reduced rate of 5.5%) had a transmission rate of 75% to consumer prices. They forecast that, in 2014, the increase in the intermediate rate from 7% to 10% and in the standard rate from 19.6% to 20% would have a transmission rate of 70% to 80%. For the rise in the standard rate of VAT from 18.6% to 20.6% in August 1995, they estimate a transmission to prices of 80%. This is in line with Carbonnier's (2008) estimates for subcategories of goods: the average transmission rate was estimated to be 53% for manufactured goods and 86% for unskilled-labour-intensive goods.

The empirical literature also reveals the relative rapidity of these adjustment mechanisms. The speed of transmission to prices is estimated at about three to four months (Carbonnier, 2008) for recent changes to VAT rates in France and Europe, with the majority of price adjustments being made during the month in which the rate change occurs (Gautier & Lalliard, 2013).

1.3. Medium-Term Effects: Adjustment of Income and Tax-Benefit Scales to Inflation, Countering the Short-Term Anti-Redistributive Effect

Following a rise in VAT rates and its partial transmission to prices, the rise in the general price level leads to delayed effects over several years on income but also on the allowances and benefits received and the taxes paid by households.

An inflation shock in year *N*, due to a rise in VAT, spreads in year *N* and subsequent years, to wages, other income and transfers, and to deductions via the following transmission channels:

- The increase in the minimum wage (SMIC) in year *N*+1;
- Wage negotiations and adjustment in primary income in year *N*+1;
- The index-linking of tax-benefit scales between year *N* and year *N*+2.

1.3.1. Adjustment in Wages and Some Sources of Income

The first channel is the increase in the minimum wage, which takes place as of 1st January of year

5. Although both studies are conducted on the basis of the 2001 Household budget survey, *the variation in burden-to-income ratios can be explained by the different methods used. In the first study, Forgeot & Starzec (2003) calculate VAT down to a detailed level of the Classification of Individual Consumption by Purpose (COICOP), including spending on maintenance work, regarded as investment in accordance with the National Accounts concepts but still subject to VAT. In the second study, Trannoy & Ruiz (2008) calculate VAT at a more aggregate level of the consumption classification and, above all, they calibrate the data on consumption (excluding spending on maintenance work) to National Accounts data to obtain effects of simulated reforms that are consistent in terms of financial amounts.*

N+1. The SMIC is index-linked to a component of inflation and on the basis of half of the increase in the purchasing power of the gross hourly wage for blue collar employees (*Salaire horaire brut des ouvriers et employés*), as measured in year *N*.

This rise automatically spreads throughout the wage scale and by means of collective wage agreements at industry sector level: negotiations allow adjustment of sector-specific minimum wages to conform with the SMIC level, in turn leading to a gradual knock-on effect on higher wages, so as to maintain wage hierarchies (Groupe d'experts sur le Smic, 2015; Fougère *et al*., 2016). Koubi & Lhommeau (2007) show that, over the 2000-2005 period, these effects on wages of an increase in the SMIC apply to wages up to 1.5 times the SMIC and therefore to the average wage (Cette *et al*., 2011). Moreover, these effects are greater when considered over a 12-month period rather than a quarter (Koubi & Lhommeau, 2007; Avouyi-Dovi *et al.*, 2010; Cette *et al*., 2011).

Inflation can also pass through directly to wages due to wage negotiations at sector, company or individual level. These negotiations most often take place at the end of year *N* or start of year *N*+1, and the majority of them translate into a change in wages at the start of year *N*+1 (about 50% of wage changes occurred in the first quarter during the 1998-2005 period; see Avouyi-Dovi *et al*., 2010; Le Bihan *et al*., 2012; Fougère *et al*., 2016). This second channel can explain how inflation affects wages above the level of 1.5 times the SMIC.

It should be noted that these effects of the spread of inflation to wages may depend on the economic cycle at the time of the wage negotiations. During a period of growth, wages have a greater probability of being increased, whereas rises will be more limited during a period of stagnation or recession. The spread effects may also depend on the cause of the inflation shock. An impact on energy prices or a rise in indirect taxation may increase business costs and lead to companies reducing their margins. This may ultimately translate into more limited wage increases.

Other sources of income that we regard as primary income, notably unemployment benefits and retirement pensions, are also index-linked, at least partly, to inflation or its components. Since 2016, basic retirement pensions and some supplementary pensions (for non-tenured public servants and most of the self-employed) are revalued on the 1st of October, following the average annual change in consumer prices, excluding tobacco, based on the last twelve monthly price indices (from August of year *N*-1 to July of year *N*). Public sector supplementary pensions (RAFP, implemented since 2005) are increased on a more discretionary basis, whereas those for private sector employees (AGIRC-ARRCO scheme) are index-linked to the inflation measurement, less one point.

The main source of income for the unemployed is the unemployment benefit known as ARE (*Allocation de retour à l'emploi*). It has three components: the fixed part of the daily benefit, the baseline daily wage and the minimum daily benefit, which are, in principle, revalued once a year at the decision of the UNEDIC board (the body in charge of managing the compulsory unemployment insurance system) which publishes the adjustment factor as of 1st July each year. Although this factor is the result of negotiations between the social partners and is often a rounded number (1% or 1.5% for example), the level of inflation is an element in the negotiations.

1.3.2. Tax-Benefit Scales are Index-Linked

Adjustments in the scales for benefits and deductions are indexed to the inflation rate for the current year or preceding years. Since 2016, the majority of social security benefits have been revalued as of 1st April, according to the average annual change in consumer prices, excluding tobacco, calculated on the basis of the last twelve monthly indices available in February (from February of year *N*-1 to January of year *N*). This is the case for the monthly basis for the calculation of family allowances (BMAF), and for various benefits (the RSA – means-tested minimum income; PA – a work-based benefit; the ASS – a special allowance for the unemployed; ASPA – an allowance for the elderly; and ASI – an invalidity benefit). Since 2014, some of the parameters for housing benefits have been adjusted as of 1st October, based on the year-on-year change in the most recent reference index for rent (IRL), i.e. for the second quarter.

In addition, under French legislation, income tax was paid up until 2018 one year after actually receiving the related income.[6] The tax scales applicable in year *N* for income in year *N*-1 (the lower thresholds for the different tax bands, minimum and maximum amounts for the flat-rate 10% deduction for business expenses, income caps for determining rebates, flat rate amounts

6. As from 1st January 2019, this time lag has been eliminated as part of the introduction of a contemporaneous tax payment system known as "deduction at source".

for rebates, etc.) are adjusted for projected inflation in year *N*-1, established around September of year *N*-1.[7]

Lastly, some means-tested social security benefits are determined on the basis of income received two years before. The corresponding upper limits on income for means-testing purposes are therefore uniformly adjusted as of 1st January of year *N*, according to the average annual change in consumer prices, excluding tobacco, in year *N*-2. This is the case for means-tested family allowances and benefits (birth allowance and basic allowance of PAJE – the early childhood benefit scheme – and family allowances since 1st July 2015) as well as housing benefits.

2. Method: a Microsimulation Approach Matching Consumption and Tax-Benefit Data

This paper aims to assess both the regressive direct effects of VAT and certain delayed effects associated with the adjustment in income and the index-linking of tax-benefit scales, which may partly compensate for them. We are seeking to remove the ambiguity surrounding the medium-term effects of a rise in VAT on household standard of living and inequality. Although our work is set within a specific medium-term framework, notably without wage-price spiral and with unchanged consumer behaviour, this is, to our knowledge, a completely new approach.

The assessment of the redistributive effects of a rise in VAT rates over three years is based on a specific use of the INES microsimulation model and its indirect taxation module (see André & Biotteau, 2019a, for an introduction to the model and André *et al.*, 2016, for the full methodology regarding the module). We thus propose an innovative methodology to quantify certain delayed effects that are not usually taken into account in the literature.

2.1. Imputation of Consumer Spending and Simulation of VAT

The consumption dataset used as the basis for calculating the VAT paid by households, is the INSEE's 2011 Household budget survey (BDF). These data are matched with National Accounts data (NA) and calibrated to make up for the underestimation of certain consumption items in the survey and so that they conform to the structure and consumption levels for the year being simulated, 2016. The disposable income derived from the BDF survey is also matched by standard of living decile with simulated disposable income, through the INES model, to keep a savings rate and burden-to-income ratios that are consistent after matching consumption and so as to be representative of disposable income for the simulated year.[8] This two-fold correction is indeed necessary in so far as we calculate and then impute fractions of consumption, as a function of disposable income, to 247 consumption items in the COICOP classification (Level 4).[9]

The imputation of the average structure of consumption (as a percentage of disposable income) to households in the INES sample is done by stratum. The three variables used to define these strata are: the standard of living decile; household type (five types: single, single-parent family, couple without children, couple with children and composite household); and housing occupancy status (two types: outright owner, owner paying mortgage or tenant). To ensure the strata are sufficiently large, certain strata are grouped together.[10] Imputation involves 71 strata.

Annual consumption amounts for each item are then recalculated based on each household's disposable income. Although households in the same stratum may have the same consumption structure and savings rate, they do not necessarily have the same levels of spending, which are directly dependent on household income.

Lastly, the amounts of VAT paid are calculated on the basis of the annual consumption amounts for each of the 247 items available in the COICOP classification, according to the following formula:

$$VAT = consumption \times \frac{\tau}{1+\tau}$$

where *consumption* is the total consumer spending in euros, including tax, and τ the VAT rate applicable to the consumption item considered.

Total imputed consumer spending stands at nearly €907 billion for 2016 and the simulated VAT totals amount to €97 billion (Table 1). Bearing in mind differences in coverage, these amounts are consistent with NA data. According to NA, in 2016, final individual consumption expenditure of all households (excluding sole

7. The Government occasionally decides to "freeze" the income tax scale. We adopt a similar convention to other INSEE studies of the reforms' effects (André et al.*, 2017), i.e. the usual situation is the one where this scale is adjusted according to inflation.*

8. Disposable income is not matched with gross disposable income as calculated by National Accounts, owing to concepts that are hard to reconcile. Moreover, using simulated microeconomic data allows for finer matching, by standard of living decile.

9. Classification of Individual Consumption by Purpose.

10. This concerns composite households, which only constitute a single stratum, and single-parent families, which are only defined on standard of living decile (André et al.*, 2016).*

Table 1 – **Proportion of consumer spending and VAT amounts simulated in INES by type of VAT rate in 2016**

VAT rates	Consumer spending (including VAT)		VAT amounts paid	
	Million€	%	Million€	%
Standard (20%)	473,543	52.2	78,924	81.1
Intermediate (10%)	120,381	13.3	10,944	11.3
Reduced (5.5%)	139,655	15.4	7,281	7.5
Super-reduced (2.1%)	5,430	0.6	112	0.1
Exemptions	167,697	18.5		
Total	906,705	100.0	97,260	100.0

Notes: Consumer spending on goods and services exempt from VAT consists of spending on rent, deposits and certain charges; medical consultations and services; parking; postal services; gambling; education and insurance services.
Reading Note: A total of €97 billion of VAT is simulated in the INES indirect taxation module. Standard-rate VAT accounts for over 80%.
Sources and Coverage: INSEE, *ERFS2014* converted to 2016 values, *BDF 2011* converted to 2016 values; INSEE-DREES, INES model and indirect taxation module. Metropolitan France, people living in "ordinary" households whose income is positive or nil and the reference person is not a student.

traders) amounts to €1,165 billion.[11] In the INES model, consumer spending is simulated for Metropolitan France for a coverage of so-called "ordinary" households (i.e. excluding people living in collective dwellings – e.g. retirement homes) whose income is positive or nil and whose reference person is not a student, and excludes sole traders. It thus covers 78% of the individual consumption calculated by NA. Moreover, as final individual consumption expenditure of households represents 67% of total final consumer spending (€1,741 billion), the proportion of VAT paid by households can be expected to be close to two thirds of total VAT (€154 billion in 2016, base 2014, semi-definitive data), as confirmed by our simulations.

2.2. Microsimulation of a Rise in VAT: Effects over Three Years

Microsimulation uses the INES microsimulation model developed jointly by INSEE and DREES (the statistical department of the French Ministry of Health and Social Affairs). Based on a sample representative of the resident population of Metropolitan France, this model simulates the various benefits and allowances to which each household is entitled, and the taxes and social contributions they have to pay. It is based on the ERFS, which combines socio-demographic data from the Labour Force Survey, and administrative data from the French national family allowance fund (CNAF), the national pensions fund (CNAV), the farmers and agricultural workers fund (CCMSA), as well as details from the income declarations made to the tax office to calculate income tax. In order to have three consecutive years of revenue to simulate French tax-benefit legislation, the ERFS is aged by two years, through margin calibration and individual change in income.

For this study, we use the 2014 ERFS to simulate 2016 legislation, based on revenue from 2014 to 2016. The INES model is static in the sense that individual professional or demographic trajectories are fixed and only the weight given to individuals may vary from year to year. However, it provides a three-year sequence, thus allowing the potential delayed effects of a rise in VAT to be taken into account. It provides a large number of individual variables on an annual basis to allow precise simulation of household standard of living and tax-benefit reforms. Matching with consumption data also allows *ex-ante* assessment of various indirect tax reform scenarios, including for VAT.

More specifically, we consider three situations, or "fictional" years, which we compare with the reference year, 2016:

- 2016 is year *N* of the inflation shock: the rise in VAT took place in 2016 (as of 1st January);
- 2016 is year *N*+1 of the shock: the rise in VAT took place in 2015;
- 2016 is year *N*+2 of the shock: the rise in VAT took place in 2014.

So, the years for which we simulate a rise in VAT are compared with reference year 2016, corresponding to the simulation of the legislation actually in force in 2016. This involves a slight dependence of yearly results on simulated legislation but to a negligible extent, owing to the difference calculation method. To be more precise, the effects subsequently shown are marginal effects, net of effects measured in preceding years. Effect *N* is thus the difference between the simulated situation in the year of the shock and the baseline situation; the *N*+1 effect is the difference between the counterfactual situation one year after the shock and the simulated situation the year of the shock; and lastly, the *N*+2 effect is the difference between the situation two years after the shock and the

11. Semi-definitive data, base 2014.

simulated situation one year after the shock. The total effect at the end of the three years equates to the sum of these annual marginal effects.[12]

The rise in VAT rates and the associated inflation shock are taken into account through their effect on the amount of VAT paid, income, tax-benefit scales and spending on rent (see Box). In the context of this study, we in fact use the concept of what is termed "adjusted disposable income", defined as disposable income less VAT and spending on rent. The adjusted standard of living is the adjusted household disposable income divided by the number of consumption units (referred to as CU hereafter, with 1 unit for the first adult in the household, 0.5 for other individuals aged 14 or over, and 0.3 for children aged under 14).

2.3. Main Simulation and Transmission Assumptions

We adopt a specific medium-term framework that does not take into account all the effects of adjustment in behaviour or macroeconomic ramifications (see below and Online Appendix C1). We also make assumptions about transmission of the rise in VAT to prices and of inflation to wages and other income (see below and Online Appendix C2).

2.3.1. Simulation Assumptions

The estimations are based on unchanged consumption behaviour (in terms of quantity consumed), in the course of the year of change in VAT rates and the two following years.

We assume that inflation as measured in February of year *N* incorporates the shock and that all the

12. This method enables reasoning other things being equal, since we are interested in the same population and same legislation. It also makes it possible to calculate total effects by adding together the marginal effects in each year. Another approach might consist of simulating an inflation shock in 2014, then measuring the consequences of it on inequality in standard of living in 2014, 2015 and 2016. However, this method would be unsuitable: over a three-year period, changes occur in legislation, demographic factors and the economic climate, which would then become confused with the effects of the simulated rise in VAT.

Box – **Simulation of a Rise in VAT over Three Years**

If 2016 is the year of the shock, year *N*, VAT rates are increased on 1st January of that year. Under the assumption made regarding transmission of VAT to prices, consumer spending and prices including tax are adjusted and the VAT amounts are recalculated, but consumer behaviour is assumed to remain unchanged in the face of the rise in prices (see André & Biotteau, 2019a, Appendix 3, for formal calculation details). We also deduce the related inflation shock. Then, during year *N*, the amounts for most social security benefits (RSA, PA, ASPA, ASI and AAH – means-tested minimum income, work-based benefit, special allowance for the elderly, invalidity benefit and special allowance for disabled adults, respectively, and allowances calculated as a percentage of the monthly basis for family allowances, BMAF, or housing benefits) are revalued as of the first of April or first of October, according to inflation measurements over the last twelve months, in accordance with the date and statutory criteria for their re-indexation. The inflation shock, on the other hand, has no contemporaneous effect on income before redistribution (earnings, income from assets or income replacement benefits, including retirement pensions and unemployment benefits), nor on other tax-benefit scales (income tax and means-testing conditions for certain benefits). Subsequently, the corresponding effect in this first year will be classed as a year *N* effect.

If 2016 is year *N*+1 after the shock, it is just as if the rise in the VAT rates took place in 2015. In 2016, earnings, income replacement benefits or income from assets (notably income from property) increase, in € at current prices, according to their estimated sensitivity to price level, specific to each type of income (see Online Appendix C2). This leads to a rise in social security contributions and social charges based on contemporaneous income. Alongside the adjustment of property income of owner households, spending on rent by tenant households is increased according to the same criterion, to account for transfers of income between the different households or institutions. Also in *N*+1, the tax scales (parameters for income tax paid in 2016 on income received in 2015) are raised in accordance with the usual criteria for re-indexing to inflation in year (including the shock, therefore) which generates a fall in income tax (as 2015 income has not yet been adjusted). In contrast, for means-tested benefits that are paid based on income received two years earlier, neither the income caps under the 2016 legislation nor the income taken into account are changed by the inflation shock of 2015. Subsequently, the corresponding effect in this year will be classed as a year *N*+1 effect.

If 2016 is year *N*+2 after the shock, the rise in VAT is then assumed to have taken place in 2014. The corresponding effect is subsequently called a year *N*+2 effect. An impact on income tax can be observed: the rise in current income in 2015 (*N*+1), following the inflation shock of 2014 (*N*), without any additional adjustment to the scales, translates into a rise in tax calculated in 2016 (year *N*+2) on the basis of the current income in 2015 (which offsets the fall in income tax that occurred in year *N*+1). In year *N*+2 there is also the additional effect on means-tested benefits (except for RSA and ASPA, for which means-testing is done on a quarterly basis). In fact, there is a two-year delay for the inflationary adjustment to the parameters for certain means-tested benefits. The rise in VAT has no other effect in year *N*+2, due to the absence of any delayed effect of inflation on income beyond a year and the assumed absence of any medium-term effect of wages on prices (wage-price spiral). So, income, tax-benefit scales and prices do not react again to the shock. We also assume that consumer behaviour remains unchanged. A three-year timespan, starting from 1st of January of year *N* seems reasonable in order to estimate the effects studied. Strictly speaking, it would be best to have a fourth year of income. However, the INES model is, by design, restricted to three years of income.

benefits and allowances concerned are consequently increased as from the year of change in the VAT rates. However, transmission of the rise in VAT to prices is assumed incomplete.

Another assumption is that the effect of the inflation shock on wages and income is deferred to year *N*+1. This delay may be explained by the different transmission channels (see Online Appendix C2). We also assume that the inflation shock in year *N* has no effect on wage dynamics in year *N*+2 or beyond. In addition, we assume the absence of an "inflationary spiral": the rise in wages in year *N*+1 does not lead to a new rise in prices in year *N*+1 or subsequent years. Consequently, there is no additional inflation shock in years *N*+1 and *N*+2.

Lastly, owing to the static nature of the model, the inflation shock does not give rise to macroeconomic effects such as potential recessive effects on employment.

2.3.2. Transmission Assumptions

In order to estimate the delayed effects of a rise in VAT, it is necessary to introduce a dynamic dimension, firstly to the transmission of the VAT rise to prices and inflation, and then to the spread of inflation to wages and other income. The effect of a rise in VAT on the general price level is calculated based on the relative weight of consumption taxed at the amended VAT rates in the consumer price index, with an assumed rate of transmission to prices of 80%. The elasticity of hourly wages to prices is calculated using augmented Phillips equations, linking wage growth rate negatively to the unemployment rate (level and variation) and positively to inflation, by hourly wage decile. There is a lag in the adjustment of hourly wages to prices, no contemporaneous effect of inflation on wages is observed and the effects do not last beyond *N*+1. Furthermore, price elasticity of hourly wages in *N*+1 decreases with the hourly wage level: unitary at the bottom of the distribution and becoming not significantly different from 0 in the top 20% of the hourly wage distribution (see Online Appendix C2).

Income replacement benefits are indexed in *N*+1 according to the usual or statutory rules on revaluation (see Online Appendix C1 on the adjustment of wages and certain income). The elasticity of other income to prices is calibrated. In the case of income from assets, only income from property and incidental income (mostly income from rental of furnished accommodation) react with unitary elasticity to a rise in prices; other forms of income from assets are assumed not to react. Lastly, self-employment income is assumed to adjust, with elasticity of 0.5 in *N*+1, except for farm income (see Online Appendix C2).

3. In the Medium Term, a Rise in VAT Slightly Increases Inequality in Standard of Living and Poverty

We present the results of a central scenario, representing a 3-point increase only in the standard rate of VAT, increasing it from 20% to 23%, with a rate of transmission to prices equal to $\alpha = 0.8$, which generates a rise in inflation by an additional 1.07 points.

We compare adjusted disposable income (defined as total income before redistribution, less direct and indirect deductions and spending on rent, plus social security benefits) and its components in the baseline situation, without any increase in VAT, and in the situation with a rise in VAT, over a three-year period. We then detail the annual effects on average adjusted income and review the adjustment mechanisms and their timing. Lastly, we present the heterogeneity of the effects, along the adjusted standard of living distribution,[13] and the change in the main inequality indicators.

To test the sensitivity of results to changes in VAT rise or to assumptions, we simulate several VAT rise scenarios of varying scale and composition, combining the assumptions on elasticity of income to prices and on transmission of the rise in VAT to the general price level. We analyse the main differences with the central scenario in Online Appendix C4.

3.1. Annual Effects and Total Medium-Term Effect on Adjusted Disposable Income and its Components

Under the assumptions in the central scenario, the effects on total adjusted disposable income and its components are given in Table 2. The rise in VAT would generate a tax revenue surplus of €11.7 billion in the first year in Metropolitan France (within the scope of "ordinary" households).[14] Income and scales for tax-benefit transfers would then adjust to inflation, partly that same year and then in the following years.

13. See André & Biotteau (2019b) for results by usual standard of living distribution (i.e. disposable income – income before redistribution, plus social security benefits and minus direct tax – by CU, without taking into account indirect taxes and spending on rent).

14. The assumption of less than full transmission to prices is based on a value of coefficient α of less than 1. This corresponds to a non-null impact hypothesis for businesses, i.e. the price net of tax may be adjusted downwards (see André & Biotteau, 2019a).

Table 2 – **Annual effects and total medium-term effect of a 3-point rise in the standard rate of VAT on components of adjusted household disposable income**

In € billion

	In year *N*	In year *N*+1	In year r *N*+2	Total
Income before redistribution (A)	0.0	6.7	0.0	6.7
Wages	0.0	3.5	0.0	3.5
Retirement pensions	0.0	2.2	0.0	2.2
Unemployment benefits	0.0	0.2	0.0	0.2
Other income (i)	0.0	0.7	0.0	0.7
Deductions (B)	11.7	-0.8	1.1	12.1
Direct tax	0.0	-1.1	1.1	0.0
Social security contributions	0.0	0.1	0.0	0.1
Other social contributions (CSG/CRDS)	0.0	0.2	0.0	0.2
Value added tax	11.7	0.0	0.0	11.7
Benefits (C)	0.6	0.3	0.2	1.1
Family allowances & benefits	0.2	0.1	0.1	0.3
Housing benefits	0.1	0.2	0.1	0.3
Statutory minimum allowances & PA (employment incentive)	0.4	0.1	0.0	0.4
Spending on rent (D)	0.0	0.7	0.0	0.7
Adjusted disposable income (A - B + C - D)	-11.1	7.1	-0.9	-5.0

(i) invalidity pensions, investment income and annuities, income from property and incidental income, foreign income, and marketable securities.
Notes: Effects in year *N*, *N*+1 and *N*+2 are marginal effects, net of effects measured in the preceding years. Year *N* effect is the difference between the simulated situation in the year of the shock and the baseline situation; the *N*+1 effect is the difference between the counterfactual situation one year after the shock and the simulated situation in the year of the shock, and the *N*+2 effect is the difference between the situation two years after the shock and the simulated situation one year after the shock. The total effect at the end of the three years is the sum of these annual marginal effects.
Reading Note: in total, after three years, household disposable income falls by €5.0 billion in real terms, resulting from a total increase of €6.7 billion in income before redistribution and of €1.1 billion in social security benefits, and a total loss of €12.1 billion related to direct and indirect taxes and of €0.7 billion from the rise in spending on rent.
Sources and Coverage: See Table 1.

In total, after three years, once these delayed effects are taken into account, adjusted household disposable income would be €5.0 billion less in real terms than it would have been without the rise in VAT. Therefore, the medium-term delayed effects make up for about 55% of the initial impact suffered by households.

Income before redistribution[15] is ultimately €6.7 billion higher (the rise occurring in *N*+1, due to adjustment in income). That same year, tenants' spending on rent increases with inflation by €0.7 billion, which increases owners' income from property. The total income tax effect is neutral because although the effects in *N*+1 and *N*+2 each amount to more than €1 billion, they cancel each other out. Lastly, in total, social security benefits increase by €1.1 billion, i.e. 9% of the initial impact of €11.7 billion on disposable income.

3.2. Breakdown of Average Effects on Adjusted Standard of Living and its Components, by Year

In Tables 3 and 4, we present the average effects per year of the rise in VAT simulated in the central scenario, on each of the adjusted standard of living components. We review the effect, in percentage terms and in amounts, on each component and their contribution to the total effect on adjusted standard of living.

At the end of the three-year sequence, the rise in VAT leads to a 0.6% fall in the average adjusted standard of living in real terms, i.e. about €114 a year (per CU). This fall can be explained mainly by the rise in indirect taxes, namely VAT. VAT increases by 12%, or an average of €269 per CU per year and contributes the most to the fall in standard of living (-1.4 percentage points,[16] Table 4). There is very little variation in other direct deductions in total. There is little change in social security benefits (+1.7% or €24 per CU per year on average) and this does not make up for the fall in standard of living.

Several dynamics explain this total medium-term effect on adjusted standard of living. Firstly, the biggest real term deterioration in standard of living is in year *N* of the shock. Indeed, VAT increases whereas nominal primary income has not yet been adjusted. Looking at social security

15. In this study, income before redistribution, constituting the primary income, includes all wages and salaries, self-employment income and income from assets but also alimonies, invalidity pensions, unemployment benefits, retirement pensions and life annuities. This outline corresponds to the income declared to the tax authorities to calculate income tax. These are magnitudes included within primary income and therefore not simulated by the INES model.

16. The initial rise in the standard rate is of 3 points (from 20% to 23%), i.e. a rise of about 12% if the transmission rate to prices including tax is 80%. VAT, on average representing 11% of adjusted standard of living, counted negatively (cf. Table 1), contributes a fall of -1.4 percentage points in standard of living.

Table 3 – **Annual effects and total medium-term effect of a 3-point rise in the standard rate of VAT on components of the average adjusted standard of living**

	Effect in € by consumption unit				Effect in %			
	In year *N*	In year *N*+1	In year *N*+2	Total	In year *N*	In year *N*+1	In year *N*+2	Total
Nominal primary income (A)	0	155	0	156	0.0	0.6	0.0	0.6
Deductions (B)	269	-18	26	277	4.6	-0.3	0.4	4.8
Direct tax	0	-25	25	1	0.0	-1.2	1.3	0.0
Social Security contributions	0	3	0	3	0.0	0.5	0.0	0.5
Other social contributions (CSG/CRDS)	0	4	0	4	0.0	0.4	0.0	0.4
Value added tax	269	0	0	269	12.1	0.0	0.0	12.1
Benefits (C)	13	7	4	24	0.9	0.5	0.3	1.7
Family allowances & benefits	4	1	2	7	0.6	0.2	0.4	1.2
Housing benefits	1	4	2	8	0.4	1.2	0.5	2.1
Statutory minimum allowances & PA employment incentive	8	2	0	10	1.5	0.3	0.0	1.8
Spending on rent (D)	0	17	0	17	0.0	1.1	0.0	1.1
Adjusted standard of living (A - B + C - D)	-256	163	-22	-114	-1.3	0.8	-0.1	-0.6

Notes: See Table 2.
Reading Note: Social security benefits increase by an average of €13 per CU in the year of the shock (i.e. a rise of 0.9%), then by an additional €7 the following year (i.e.+0.5%) and by a further €4 in the third year (i.e. +0.3%). In total, three years after the rise in VAT, following adjustment mechanisms, benefits therefore increase by an average of 1.7%, or €24 per CU.
Sources and Coverage: See Table 1.

Table 4 – **Contribution to the annual effects and total medium-term effect by average adjusted standard of living component**

	Contribution to the total effect (in percentage points)			
	In year *N*	In year *N*+1	In year *N*+2	Total
Nominal primary income (A)	0.0	0.8	0.0	0.8
Deductions (B)	-1.4	0.1	-0.1	-1.4
Benefits (C)	0.1	0.0	0.0	0.1
Spending on rent (D)	0.0	-0.1	0.0	-0.1
Adjusted standard of living (A + B + C+ D)	-1.3	0.8	-0.1	-0.6

Notes: See Table 2.
Reading Note: In the first year, standard of living falls by 1.3%. There is a contribution of -1.4 percentage points from the rise in VAT and of 0.1 percentage point from the rise in social security benefits.
Sources and Coverage: See Table 1.

benefits, the mechanisms for adjusting them are at work for three quarters of the year, from April onwards, through the amounts paid as family benefits and statutory minimum allowances (RSA, PA, ASPA, ASI and AAH – cf. 1.3.2.) and for a quarter of the year, from October onwards, through housing benefits. The statutory minimum allowances and PA therefore adjust more (+1.5%) than housing benefits (+0.4%). This 0.9% rise in benefits represents an average of €13 per CU per year. In year *N* of the shock, adjusted standard of living falls by 1.3% (or about €260 per CU per year), i.e. a loss of -1.4 points linked to the rise in VAT and a gain of +0.1 following the increase in benefits.

The following year, in *N*+1, the dynamics of the medium-term effects come into play, leading to a rebound in standard of living of about 0.8%, or €160 per CU per year, almost entirely brought about by the adjustment in income. As not all wages adjust to the same proportion and given that not all income is indexed to inflation, primary income increases by an average of 0.6%, or about €155 per CU per year. However, this causes a rise in social security contributions and taxes (+€7 per CU per year, on average). But income tax decreases slightly owing to the one-year time lag between income tax return and collection of that tax: while the scales in *N*+1 (defining tax bands, in particular) are indexed to the inflation rate of the previous year, therefore to the shock, the income taken into account is also that of year *N* and has not yet been adjusted. This results in a slight increase in standard of living of about €25 per CU per year, on average. The effect of increases in the amounts for social security benefits can still be seen in *N*+1, in particular for housing benefits, which increase by 1.2%. However, as benefits have a limited weight in the average standard of living, they do not contribute to its rise. Lastly, spending

on rent adjusts in *N*+1, as does income from property and incidental income: these sources of income represent a partial redistribution within households between owners and tenants.[17] They increase by 1.1%, that is, the same magnitude as the inflation shock, and lower the average standard of living by -0.1 point.

Lastly, in *N*+2, the additional effects are reduced and are associated largely with lags in indexation. Income tax increases slightly, as it is calculated on the previous year's income, now adjusted, without the scales being indexed to additional inflation again. Social security benefits also increase slightly (+0.3%) because the ceilings for means-tested benefits are indexed to the inflation shock, but the incomes taken into account are not yet index-linked. In the third year after the rise in VAT and the impact on prices, the standard of living falls marginally by 0.1% in real terms (or about €20 per CU per year), with the rise in deductions prevailing (contribution of -0.1 point, compared with other components' null contribution).

3.3. The Heterogeneity of Effects and Redistribution

We now analyse the effects differentiated by position on the adjusted standard of living scale. The mechanisms for adjusting income and tax-benefit scales as well as the rise in indirect taxes can, indeed, work in different ways, depending on the structure of household income or household consumption. Detailed results by adjusted standard of living component and by year are shown in André & Biotteau (2019a).

3.3.1. Total Effect along the Adjusted Standard of Living Distribution

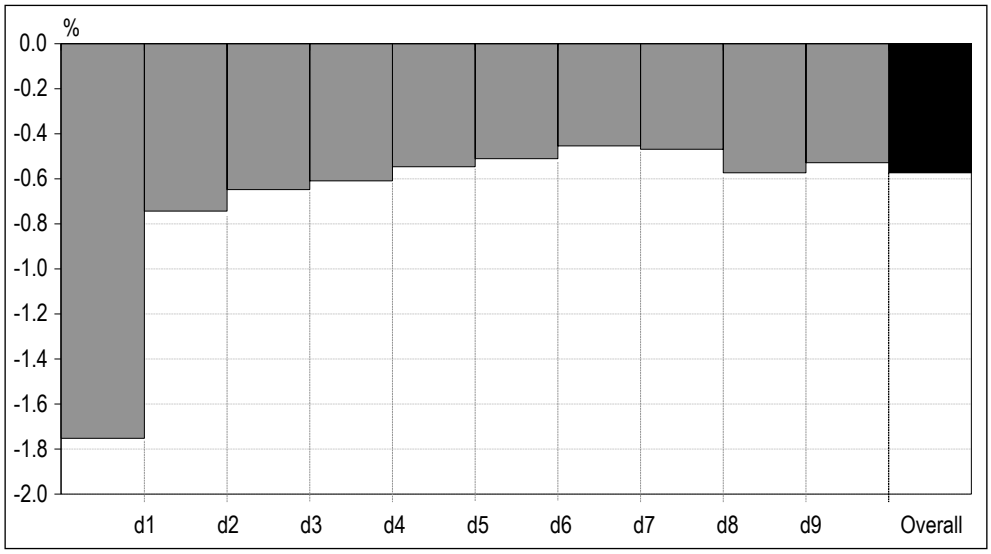
VAT rises and their consequences lead to a fall in adjusted standard of living for the entire population. However, this fall is more pronounced for the poorest 10%: their adjusted standard of living falls by 1.8% compared with a maximum fall of 0.7% for the rest of the population (Figure II).

However, although the standard of living for households as a whole falls and in similar proportions for most of them, the contributions made by income before redistribution, direct and indirect levies, social security benefits and spending on rent differ noticeably according to adjusted standard of living.

The poorest 10% people see their adjusted standard of living fall by an average of €86 (Table 5), which is largely explained by the rise in VAT (-€158 per CU). The 10% most affluent experience an average fall in standard of living of €273. The average fall in standard of living for median households is about €88. All households experience a fall in the first year (-€119 in the bottom 10%, -€231 between the fourth and fifth deciles and -€495 in the top 10%) and make up for some of their loss in the second year (+€28 for the bottom 10% and +€309 for the top 10% of the population). In the third year, there are

17. There is indeed a transfer between tenant and owner households but this is not neutral. In fact, households in the sample that receive income from property are not necessarily private landlords to whom the tenants pay rent, and the tenants in the sample may also pay rent to institutional, public or private landlords.

Figure II – **Total medium-term effect of a 3-point rise in the standard rate of VAT on the average adjusted standard of living, by adjusted standard of living**



Reading Note: Following a 3-point rise in the standard rate of VAT, the adjusted standard of living for the poorest 10% of the population falls by nearly 1.8%.
Sources and Coverage: See Table 1.

Table 5 – **Annual effects and total medium-term effect of a 3-point rise in the standard rate of VAT on the average adjusted standard of living, by adjusted standard of living**

In € per CU

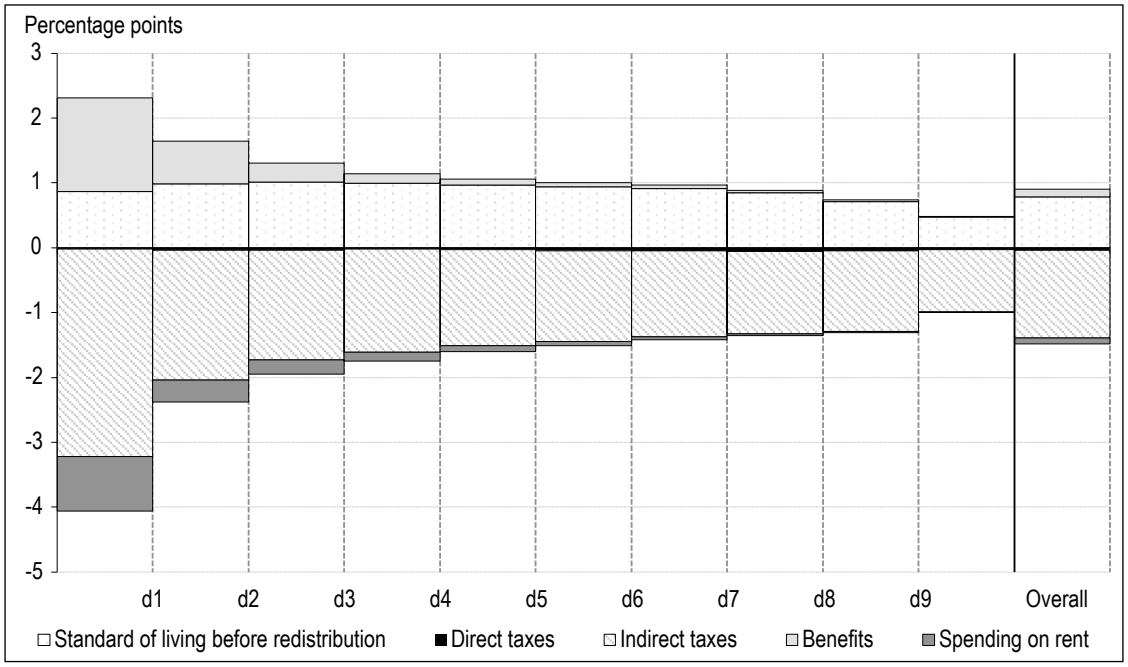
	In year *N*	In year *N*+1	In year *N*+2	Total
<d1	-119	28	5	-86
d1 to d2	-146	74	5	-67
d2 to d3	-178	104	-1	-75
d3 to d4	-208	126	-3	-84
d4 to d5	-231	152	-9	-88
d5 to d6	-254	181	-22	-94
d6 to d7	-274	208	-30	-96
d7 to d8	-304	223	-34	-114
d8 to d9	-363	239	-45	-169
>d9	-495	309	-87	-273
Overall	-256	163	-22	-114

Notes: See Table 2.
Reading Note: The standard of living for the poorest 10% of people falls by an average of €119 the year of the rise in VAT, then increases by €28 and again by €5 in the following two years, thus constituting an overall average fall in standard of living of €86.
Sources and Coverage: See Table 1.

nil or negligible gains for the 50% least well off of the population, whereas losses increase with standard of living for the 50% the most affluent (Table 5 and Figure II).

The extent to which the various adjusted standard of living components contribute to its overall fall differ by standard of living (Figure III). VAT and spending on rent contribute the most to the fall in standard of living for the 20% of the population who are least well-off (by -3.2 points and -0.8 points respectively for the poorest 10% and by -2.0 points and -0.3 points respectively for the next 10%), as they carry relatively more weight. Conversely, the index-linking of benefits also has a decisive influence for these least well-off 20% of people (contribution of +1.4 points and +0.7 points respectively). For those higher in the standard of living distribution, this index-linking does not make up much for the fall in standard of living, due to the decreasing influence of benefits on their standard of living. Lastly, the contribution of primary income follows a bell-shaped distribution according to standard of living. Adjustment in income is less favourable for people with

Figure III – **Breakdown of the total medium-term effect of a 3-point rise in the standard rate of VAT on the average adjusted standard of living, by adjusted standard of living**



Reading Note: Following a 3-point rise in the standard rate of VAT, indirect taxes contribute a fall of -3.2 percentage points in the adjusted standard of living for the poorest 10% of the population, while benefits contribute a rise of +1.4 points.
Sources and Coverage: See Table 1.

the highest standard of living, owing to less index-linking for the highest wages and the higher proportion of income from assets, which adjusts less than wages to the rise in prices.

There are multiple mechanisms explaining the overall negative effect for the poorest 10% of the population. Firstly, the rise in spending on rent plays a major role: by design, people with the lowest adjusted standard of living are those with the lowest disposable income, paying significant amounts of VAT and with high rent costs. Additionally, their primary income does not fully adjust as it is partly made up of unemployment benefits (18% of primary income compared with an average of 3% for the population as a whole) and supplementary pensions for private sector employees. These two components are not fully indexed to the rise in prices. Similarly, not all employees in this population category are necessarily paid the minimum wage. Income before redistribution therefore only increases by an average of 0.8% for an inflation shock of 1.1%. In addition, even if 100% of the adjusted disposable income consists of benefits (see André & Biotteau, 2019a), means-testing of RSA and PA includes housing benefits and family allowances. This partly limits the effects of index-linking due to high marginal tax rates in this part of the distribution of income. Therefore, for the poorest 10%, the indexing of benefits does not totally make up for the rise in VAT and spending on rent.

Lastly, households with the lowest adjusted standard of living devote a larger proportion of their adjusted disposable income to VAT (27% compared with an average of 11%). Taking into account their entire consumer spending, the average savings rates for the poorest 30% of the population are negative (see André *et al.*, 2016). The significant negative effect therefore persists despite all the indexing and adjustment mechanisms. It depends partly on consumption behaviour, differentiated by standard of living.

3.3.2. Effects on Inequality Indicators

Three years after a 3-point rise in the standard rate of VAT, the rise in indirect taxes, associated with the dynamics of income and tax-benefit scales, contributes to a slight increase in inequality in adjusted standard of living. Table 6 shows the effects for the central scenario.

All inequality and poverty indicators increase in the year of the rise in VAT, as this has the strongest effect on the poorest in the first year. Then they ultimately increase to a lesser degree in the medium term, owing to the delayed effects more or less favourable depending on standard of living. The d9/d1 inter-decile ratio increases slightly in the medium term (+0.3%) as the delayed effects largely compensate for the initial effect. In the same way, the initial rise of +0.4% in the Gini index and rise of +0.3% in the poverty rate goes to +0.2% at the end of the three years analysed, under the assumptions made for the central scenario and the wage adjustment.[18] The p95/p5 inter-percentile ratio increases in a slightly more significant way in the first year (+1.3%) and in the medium term (+1.0%), as the delayed effects only partly compensate for the initial effects. The poverty gap increases more in the medium term than in the short term (+1.4%, or 0.4 points), due to the fall in standard of living for the poorest 10% of the population.

By way of comparison, the variants presented in Fontaine & Sicsic (2018), show that a 3% reduction in the base rate of RSA (i.e. a monthly fall of about €16) entails stability in the poverty threshold and rate and in the Gini index, as well as a 0.01 point rise in the inter-decile ratio and 0.4 point rise in the poverty gap.

Furthermore, comparing the year *N* effect and the total effect also allows identifying the

18. In the alternative simulations shown in Online Appendix C4 (and detailed in André & Biotteau, 2019a), these indicators may increase even more if the rise in VAT is more significant and especially if there is a greater and more uniform adjustment in wages according to wage level.

Table 6 – **Annual effects and total medium-term effect of a 3-point rise in the standard rate of VAT on the main indicators of inequality in adjusted standard of living**

	In year *N*		In year *N*+1		In year *N*+2		Total effect	
	Points	%	Points	%	Points	%	Points	%
d9/d1 inter-decile ratio	0.03	0.6	0.00	0.0	-0.01	-0.3	0.01	0.3
p95/p5	0.10	1.3	0.01	0.1	-0.02	-0.3	0.08	1.0
Gini index	0.001	0.4	-0.000	-0.1	-0.000	-0.1	0.001	0.2
Poverty rate	0.1	0.3	0.0	0.0	-0.0	-0.1	0.0	0.2
Poverty gap	0.1	0.5	0.2	0.9	0.0	0.0	0.4	1.4

Notes: See Table 2.
Reading Note: Following a 3-point rise in the standard rate of VAT, the inter-decile ratio increases by 0.03 point in the first year (or +0.6%), stabilises in the second year before falling by 0.01 point in the third year (i.e. -0.3%). In total, it increases by 0.01 point (+0.3%).
Sources and Coverage: See Table 1.

role of the delayed effects. For instance, the p95/p5 inter-percentile ratio reduces very slightly between year *N* and the total effect, as the marked rise in the first year (linked to a clearly more pronounced drop in p5 than in p95, due to the greater increase in VAT paid, relatively speaking, by the least well-off) is not much compensated for in the following two years. The poverty gap changes more noticeably in the medium term (+1.4%) than in the first year (+0.5%), as its increase is accentuated in the second year (the median adjusted standard of living for poor people increases less than the poverty threshold, as the effects of the increase in income and social security benefits are limited by the rise in spending on rent) and is only very partially compensated for in the third year. So, even though the overall delayed effects are favourable to households as a whole, the poorest remain the poorest and are more affected, relatively speaking, by the rise in VAT and increased spending on rent.

* *
*

The results of this study help inform public debate and supplement existing work on the consequences of rises in VAT by taking into account both direct and medium-term delayed effects: the short-term anti-redistributive effects are partly counterbalanced by these delayed effects. In the medium term, a rise in VAT slightly increases inequality in standard of living and poverty.

In the central scenario, three years after a three-point rise in the standard rate of VAT, the average standard of living, adjusted for VAT and spending on rent, is 0.6% lower than it would have been in the absence of said rise in VAT. This fall represents about 45% of the direct short-term effect; in other words, the medium-term delayed effects make up for about 55% of the initial impact suffered by households. Depending on the assumptions made on the sensitivity of income to inflation and on the transmission of the VAT to prices, this fall in the average standard of living ranges between 0.3% and 0.8%, or a reduction in standard of living in the medium term of between €70 and €155.

There is little difference in this loss of adjusted disposable income by initial standard of living: it is between 0.5% and 0.6% for 90% of the population (above the lowest adjusted standard of living decile). But it is mainly linked to the rise in VAT and, to a lesser extent to spending on rent (which increases with inflation), for the poorest households; it is more related to insufficient adjustment of income before redistribution for the most affluent households. The poorest 10% stand out, as the relative fall in their standard of living is more than twice that of the rest of the population.

In the medium term, a rise in VAT, combined with the dynamics of income and tax-benefit scales, slightly increases inequality in adjusted standard of living and poverty. The magnitude of the impact depends partly on the indicator used. All inequality and poverty indicators increase in the year of the rise in VAT. In the case of the inter-decile ratio (d9/d1), the Gini index and poverty rate, this initial effect is then almost entirely offset by the indirect effects and the indicators are ultimately almost stable. The p95/p5 inter-percentile ratio increases more significantly in the medium term, with little compensation for the first-year rise. Only the poverty gap increases more in the medium term than in the short term, which is a consequence of the fall in standard of living of the 10% of people on the lowest income, for whom the indexing of benefits does not fully make up for the rise in VAT.

The effects on poverty and inequality presented in this study do not include any potential public spending made possible by the extra tax revenue. Redistributive changes in transfers such as increased benefits or targeted lower deductions would have opposite effects.

Nor do these estimates take account of credit constraints, which may differ depending on standard of living; now in the first year, a rise in VAT has a greater effect, relatively speaking, on the standard of living of households with a modest income. Owing to time lags between the means taken into account and payment of certain benefits, the adjustment period for standard of living can extend to up to two years after the rise in VAT for the lowest income households.

Generally, these results are due to the mechanisms of transmission to income and tax-benefit scales, based on the indexing rules and wage adjustment mechanisms. They are therefore specific to the characteristics of the French tax-benefit system. In their absence, the unequal first round effects would only be more persistent in the medium term. In the context of an income tax deducted at source and where benefits are paid based on contemporaneous income or with a reduced time lag, the total medium-term results would be identical, with the only changes being in terms of the time frame for effects between years *N*, *N*+1 and *N*+2.

Additionally, these results are based on specific assumptions, drawn from earlier work on transmission of VAT rises to prices and on the adjustment of income to inflation, and are dependent on the INES microsimulation model. They cannot be applied to other, even apparently, similar situations. So, any cut in VAT, such as the "sit-down restaurant VAT rate" for example, or concerning other specific products, cannot be assessed based on these results. The same applies for an overall cut in the standard rate or in other rate types: the effect of reduced rates are not symmetrical to the rise-related effects assessed here. In particular, given downward wage rigidity, the asymmetry in VAT cuts and rises partly results from these differences in the transmission of inflation shocks to wages. This asymmetry has been documented by Benzarti *et al.* (2017) on the basis of European data, empirically showing that prices are adjusted three to four times more following a rise in VAT than after a cut. Other rigidity mechanisms may limit downward transmission: Benzarti & Carloni (2017) thus show that the reduction in VAT for sit-down restaurants mainly benefited restaurant owners and had no notable effect on prices.

Nor can the analysis be applied to the rise in excise duty on tobacco that was introduced in 2018. While similar in principle, this rise in indirect taxation of consumer goods is nevertheless different as regards these effects, primarily because tobacco prices are excluded from the official measure of inflation and therefore from statutory adjustment criteria. Moreover, it is unlikely that wage negotiations consider this rise concerning a particular type of goods. Similarly, any rise in VAT for a specific sector or particular goods will have different effects from those presented in this study, particularly in the absence of any notable effect on inflation and therefore adjustment in income and benefits.

On the other hand, the method presented in this paper might be applied to a scenario in which the intermediate rate is aligned to the standard rate, i.e. a ten-point rise in the former. However, it must be remembered that our assumptions do not include any adaptation in consumer behaviour, which might be more pronounced in the event of the doubling of the intermediate rate. The estimated effects on total adjusted disposable income might therefore be even greater, while estimated effects on the distribution of this income and on inequality might be even smaller, considering that the most affluent households have more margin for manoeuvre to adjust their consumption and thus soften the effect of the rise in VAT.

A natural extension to this study might therefore be to introduce a range of behavioural assumptions, in which consumers would alter their consumption depending on the products under consideration. Other areas for expansion might consist in strengthening the macroeconomic assumptions, notably by including a wage-price spiral or by introducing an additional level of variability in the scenarios through transmission rates of the rise in VAT differentiated by product type and VAT rate (Carbonnier, 2008). □

Link to Online Appendices: https://www.insee.fr/en/statistiques/fichier/5347210/ES-522-523_Andre-Biotteau_Online_Appendices.pdf

BIBLIOGRAPHY

André, M., Biotteau, A.-L. & Duval, J. (2016). Module de taxation indirecte du modèle Ines – Hypothèses, principes et aspects pratiques. DREES, *Document de travail, Série sources et méthodes* N° 60. https://drees.solidarites-sante.gouv.fr/IMG/pdf/dt60.pdf

André, M., Biotteau, A.-L., Fredon, S., Omalek, L. & Schmitt, K. (2017). Les réformes des prestations et prélèvements intervenues en 2016 opèrent une légère redistribution au bénéfice des 20 % les plus modestes. *Insee Références*, *France, portrait social, édition 2017,* pp. 125–144. https://www.insee.fr/fr/statistiques/fichier/3197273/FPORSOC17j_D3_mesures-sociales.pdf

André, M. & Biotteau, A.-L. (2019a). Effets de moyen terme d'une hausse de TVA sur le niveau de vie et les inégalités : une approche par microsimulation. Insee, *Document de travail* N° F1901-G2019/01. https://www.insee.fr/fr/statistiques/fichier/version-html/3714024/F1901-G2019-01.pdf

André, M. & Biotteau, A.-L. (2019b). À moyen terme, une hausse de la TVA augmente légèrement les inégalités de niveau de vie et la pauvreté. *Insee Analyses* N° 43. https://www.insee.fr/fr/statistiques/3713290

André, M. & Guillot, M. (2014). 1914-2014 : cent ans d'impôt sur le revenu. *Les notes de l'IPP* N° 12. https://www.ipp.eu/wp-content/uploads/2014/07/n12-notesIPP-juillet2014.pdf

Avouyi-Dovi, S., Fougère, D. & Gautier, E. (2010). Wage Rigidity, Collective Bargaining and the Minimum Wage: Evidence from French Agreement Data. Banque de France, *Document de travail* N° 287. https://publications.banque-france.fr/sites/default/files/medias/documents/working-paper_287_2010.pdf

Benzarti, Y. & Carloni, D. (2017). Who Really Benefits from Consumption Tax Cuts? Evidence from a Large VAT Reform in France. NBER, *Working Paper* N° 23848. https://www.nber.org/papers/w23848.pdf

Benzarti, Y., Carloni, D., Harju, J. & Kosonen, T. (2017). What Goes Up May Not Come Down: Asymmetric Incidence of Value-Added Taxes. NBER, *Working Paper* N° 23849. https://www.nber.org/papers/w23849.pdf

Besson, E. (2007). TVA sociale. Rapport du secrétariat d'état chargé de la prospective et de l'évaluation des politiques publiques. https://www.vie-publique.fr/sites/default/files/rapport/pdf/074000556.pdf

Boutchenik, B. (2015). Les effets redistributifs de la taxe sur la valeur ajoutée. Rapport particulier pour le CPO. https://www.ccomptes.fr/sites/default/files/EzPublish/20151216-rapport-Boutchenik-effets-redistributifs-de-la-TVA-.pdf

Carare, A. & Danninger, S. (2008). Inflation Smoothing and the Modest Effect of VAT in Germany. IMF, *Working Paper* N° 08/175. https://www.imf.org/external/pubs/ft/wp/2008/wp08175.pdf

Carbonnier, C. (2008). Différence des ajustements de prix à des hausses ou baisses de taux de TVA : un examen empirique à partir des réformes françaises de 1995 et 2000. *Économie et Statistique,* 413, 3–20. https://www.insee.fr/fr/statistiques/fichier/1376870/ES413A.pdf

Carbonnier, C. (2012). La TVA sociale peut-elle relancer l'économie ? LIEPP, *Policy Brief* N° 1. https://spire.sciencespo.fr/hdl:/2441/7o52iohb7k6srk09n6dh589i4/resources/liepp-pb-1-tva-sociale.pdf

Cette, G., Chouard, V. & Verdugo, G. (2011). Les effets des hausses du Smic sur le salaire moyen. *Économie et Statistique,* 448-449, 3–28. https://www.insee.fr/fr/statistiques/fichier/1377686/ES448A.pdf

Conseil des prélèvements obligatoires (2015). La taxe sur la valeur ajoutée. Rapport. https://www.ccomptes.fr/sites/default/files/EzPublish/20151216-rapport-TVA.pdf

Projet de loi de finances pour 2014 (2013). Évaluation des voies et moyens – Tome 1 : Recettes. https://www.performance-publique.budget.gouv.fr/sites/performance_publique/files/farandole/ressources/2014/pap/pdf/VMT1-2014.pdf

Fève, P., Matheron, J. & Sahuc, J. (2010). La TVA sociale : bonne ou mauvaise idée ? *Économie & prévision*, 193(2), 1–19. http://doi.org/10.3917/ecop.193.0001.

Fontaine, M. & Sicsic, M. (2018). L'effet d'une variation du montant de certains transferts du systéme socio-fiscal sur le niveau de vie : résultats sur 2016 à partir du modéle de microsimulation Ines (Cahier de variantes). Insee, *Document de travail* N° F1806. https://www.insee.fr/fr/statistiques/3604001

Forgeot, G. & Starzec, C. (2003). L'impact redistributif des impôts indirects en France. *Économie publique : Études et recherches,* 13, 165–205. https://halshs.archives-ouvertes.fr/halshs-00268929

Fougère, D., Gautier, E. & Roux, S. (2016). The impact of the national minimum wage on industry-level wage bargaining in France. Banque de France, *Document de travail* N° 587. https://publications.banque-france.fr/sites/default/files/medias/documents/document-de-travail_587_2016.pdf

Garbinti, B. & Lamarche, P. (2014). Les hauts revenus épargnent-ils davantage ? *Économie et Statistique*, 472-473, 49–64. https://www.insee.fr/fr/statistiques/fichier/1377765/ES472C.pdf

Gautier, E. & Lalliard, A. (2013). Quels sont les effets sur l'inflation des changements de TVA en France ? *Bulletin de la Banque de France* N° 194. https://www.banque-france.fr/sites/default/files/medias/documents/bulletin-de-la-banque-de-france_194_2013-t4.pdf

Georges-Kot, S. (2015). Annual and lifetime incidence of the value-added tax in France. Insee, *Document de travail* N° G 2015/12. https://www.insee.fr/fr/statistiques/fichier/1381136/G2015-12.pdf

Gilles, C. & Fauvin, F. (1996). Du blocage des prix vers la déréglementation : 50 ans de prix à la consommation. *Insee Première* N° 483. https://www.epsilon.insee.fr/jspui/handle/1/845

Groupe d'experts sur le Smic (2015). Rapport annuel du groupe d'experts Smic. Direction générale du Trésor. https://www.tresor.economie.gouv.fr/Articles/284b121f-b187-4280-b327-05f18064c3fa/files/d3c65bb8-144e-4f8d-ab6f-d2da08330ec1

Koubi, M. & Lhommeau, B. (2007). Les effets de diffusion de court terme des hausses du Smic dans les grilles salariales des entreprises de dix salariés ou plus sur la période 2000-2005. *Insee Références*, *Les salaires en France, édition 2007,* pp. 67–82. https://insee.fr/fr/statistiques/fichier/1373191/salfra07ae.pdf

Le Bihan, H., Montornès, J. & Heckel, T. (2012). Sticky Wages: Evidence from Quarterly Microeconomic Data. *American Economic Journal: Macroeconomics*, 4(3), 1–32. http://doi.org/10.1257/mac.4.3.1

Trannoy, A. & Ruiz, N. (2008). Le caractère régressif des taxes indirectes: les enseignements d'un modèle de microsimulation. *Économie et Statistique*, 413(1), 21–46. https://www.insee.fr/fr/statistiques/fichier/1376872/ES413B.pdf

Unemployment and Risky Behaviours: The Effect of Job Loss on Alcohol and Tobacco Consumption

Jérôme Ronchetti* and Anthony Terriau**

Abstract – This article analyses the impact of a transition from employment to unemployment on alcohol and tobacco consumption, and more specifically on risky behaviours. With cross-section data, we observe significant differences between the employed and the unemployed both in terms of frequency and quantity consumed. However, this association between unemployment and risky behaviours disappears when we use longitudinal data and a difference-indifferences propensity score matching approach to reduce the selection bias. Our results suggest that, in the French context, the event of unemployment does not lead to a significant increase in risky behaviours.

JEL Classification: C23, I10, I12, I18
Keywords: unemployment, tobacco, alcohol, addictions

** Magellan, Université Jean Moulin Lyon 3, Iaelyon School of Management (jerome.ronchetti@univ-lyon3.fr); ** GAINS, Le Mans Université (anthony.terriau@univ-lemans.fr)*

The authors would like to thank two anonymous reviewers for the valuable comments.
Received in March 2019, accepted in January 2020. Translated from "Chômage et comportements à risque : quel effet de la perte d'emploi sur la consommation d'alcool et de tabac ?"

Citation: J. Ronchetti & A. Terriau (2021). Unemployment and Risky Behaviours: The Effect of Job Loss on Alcohol and Tobacco Consumption. *Economie et Statistique / Economics and Statistics*, 522-523, 23–41. https://doi.org/10.24187/ecostat.2021.522d.2039

The interaction between health and unemployment has attracted a growing interest for several years, particularly following the rise in unemployment observed after the 2008 financial crisis. Some of the literature, based on simple correlations, shows a strong association between unemployment and health. However, we cannot infer from this that unemployment has a negative causal effect on health. Firstly, there is a selection bias: the youngest individuals, for example, have a higher probability of being unemployed (Gervais *et al*., 2016). Some authors have also shown the existence of a reverse causality: workers in poor health have a greater probability of losing their jobs (Jusot *et al*., 2008). Moreover, unemployed people in weak health have more difficulty finding or staying in employment (Barnay & Defebvre, 2016). These factors may explain why we observe a higher proportion of individuals in poor health within the unemployed population, even in the absence of any causal effect of unemployment on health.

There are several methods for identifying the health effect of unemployment. One initial method consists of using an exogenous event that results in unemployment. Salm (2009) and Schmitz (2011) use business closures in the USA and Germany respectively, and show that the experience of unemployment does not have any significant impact on health. In France, business closures are rarer than in the USA or Germany and several mechanisms allow firms to part with their workers prior to the permanent closure of their business (mutually agreed contract termination, redundancy, etc.). Consequently, this approach cannot be used in the case of France.[1] A second approach consists of using propensity score matching methods. Research conducted by Browning *et al*. (2006), Böckerman & Ilmakunnas (2009), Gebel & Voßemer (2014), and Ronchetti & Terriau (2019; 2020) in Denmark, Finland, Germany and France respectively, conclude in this way that the experience of unemployment has no significant effect on state of health. While unemployment does not appear to have any significant short-term impact on health, it is possible, however, that it may lead to a change in living habits and addictive behaviour that could have a longer term impact on health. The work of Marcus (2014), based on German data, shows that losing their job encourages those who did not used to smoke to start smoking but does not increase cigarette consumption by individuals who were already smokers.

There are multiple ways in which alcohol and tobacco consumption may be influenced during a spell of unemployment. Firstly, if alcohol and tobacco are normal goods, the drop in income due to job loss should lead to reduced consumption of both these goods (Hill, 2003; 2014). However, Peretti-Watel *et al*. (2009) observe a higher prevalence of smoking among the poorest individuals. Jarvis & Wardle (1999) showed that the deterioration in lifestyle sometimes observed in the event of a negative shock can be explained by the individual's need to compensate "psychologically" for their short-term social and economic difficulties. The experience of unemployment has been said to be associated with an increase in stress, a greater preponderance of somatic, depressive and anxiety syndromes and a more general deterioration in mental health (Linn *et al*., 1985; Osipow & Fitzgerald, 1993; Bartley & Owen, 1996; Thomas *et al*., 2005; Burgard *et al*., 2007; Tefft, 2011; Gathergood, 2013; Blasco & Brodaty, 2016). The psychological shock caused by job loss might then lead to an increase in risky behaviour through excessive consumption of alcohol, cigarettes or medicinal substances (Peck & Plant, 1986; Lee *et al*., 1991; Morris *et al*., 1992; Montgomery *et al*., 1998; Falba *et al*., 2005; Kuhn *et al*., 2009; Browning & Heinesen, 2012; Classen & Dunn, 2012; Ahmed & Peeran, 2016).

Some of the literature concerns the relationship between consumption of alcohol and tobacco. Several studies suggest the existence of a kind of complementarity between these two goods (Tauchmann, 2013). Drinkers of alcohol are said to have a greater probability of smoking and smokers a greater propensity to drink alcohol (Shiffman & Balabanis, 1995; Madden & Heath, 2002; Falk *et al*., 2006; De Leon *et al*., 2007). Several studies show that a price rise or the lowering of the legal age for consuming one of these goods translates into a fall in consumption of both goods (Dee, 1999). Laboratory tests tend to show that alcohol stimulates tobacco consumption (Mintz *et al*., 1985; Mello *et al*., 1987) while nicotine encourages people to drink more alcohol (Acheson *et al*., 2006; Barrett *et al*., 2006). Consequently, it is necessary to analyse the effect of unemployment both on alcohol consumption and on tobacco consumption.

Analysis of the effects of unemployment on alcohol and tobacco consumption is of great relevance from a public health perspective. Tobacco

1. The Labour Force Survey allows identifying individuals who have lost their job following the closure of a business and, as from 2013, includes state of health variables. However, the sample obtained is too small for our purposes.

can cause many pathologies, in particular different types of cancer, lung pathologies and cardiovascular disease (Sturm, 2002; Bjartveit & Tverdal, 2005). Alcohol, in turn, can cause neurological diseases and cognitive impairment and can trigger cardiovascular or digestive problems (Anderson *et al*., 1993; Edwards, 1997; Nelson *et al*., 2013; Praud *et al*., 2016; Connor, 2017). According to the French Ministry for Solidarity and Health, these are the two main causes of avoidable mortality in France. Several studies consider tobacco consumption to be the cause of nearly 20% of deaths, whilst consumption of alcohol is said to be responsible for about 3.5% of deaths in developed countries (Peto *et al*., 1992; McGinnis & Foege, 1993; Mokdad *et al*., 2004; Danaei *et al*., 2009; Ma *et al*., 2018). Moreover, a significant proportion of health expenditure is attributable to consumption of these two substances (Xu *et al*., 2015; Miquel *et al*., 2018). It would therefore appear to be essential to analyse whether unemployment may contribute to increased consumption of alcohol and tobacco and to the development of risky behaviour. Such an analysis is all the more important as the pathologies attributable to alcohol and tobacco may arise several years later. Most studies that assess the effect of unemployment on health are based on indicators of perceived health, measurements of mental health or health care consumption in the short term. However, it is possible that some effects of unemployment on health may only be perceived in the long term, beyond the time periods generally observed in surveys conducted in France (Blasco & Brodaty, 2016, using SIP – *Santé et Itinéraire Professionnel*, a survey on health and professional career; Ronchetti & Terriau, 2020, with the ESPS – *Enquête Santé et Protection Sociale*, a survey on health, access to healthcare and insurance; and Ronchetti & Terriau, 2019, using the *Enquête Emploi*, the French Labour Force Survey). In the case of France, one way of analysing the potential impact of unemployment on health beyond the survey periods (a maximum of 4 years for most French longitudinal surveys) consists of observing whether there are any short-term changes in addictive or risky behaviour, liable to have an impact on health in the longer term.

If unemployment causes a rise in risky behaviour in terms of consumption of alcohol and tobacco, the public authorities must take into consideration the negative externalities of unemployment as regards health and further increase their efforts to tackle unemployment. Moreover, if unemployment leads to an increase in addictive behaviour, this is likely to last well beyond the period of unemployment. Indeed, it has been shown that excessive or regular consumption of alcohol or tobacco leads to increased risk of absenteeism and a reduction in work productivity (Batenburg & Reinken, 1990; Halpern *et al.*, 2001; Rice *et al*., 1998; Norström, 2006). Alcoholism and smoking are also associated with a lower probability of finding work and an increased risk of unemployment (Johansson *et al*., 2007; Mullahy & Sindelar, 1996; MacDonald & Shields, 2004). Consequently, the economic cost of a rise in risky behaviour and addiction may be highly significant and demands special attention.

Lastly, the economic, social and institutional environment may have a significant influence on the relationship between unemployment and consumption of alcohol and tobacco. On the one hand, alcohol and tobacco are heavily taxed products and vary greatly in price from one country to another. On the other hand, the net replacement ratio, i.e. the income an unemployed person receives as a percentage of their old salary, is dependent on the specific unemployment insurance and welfare systems for each country. As emphasised by Ahn *et al.* (2004), this net replacement ratio may influence the way in which a period of unemployment is experienced. It may affect consumption of alcohol and tobacco through the role it plays in stress and mental health (precursors) but also through the shock to income caused by job loss. Consequently, the impact of unemployment on consumption of alcohol and tobacco may vary greatly by country, especially if there is a significant income effect. Lastly, although some studies have already been conducted to examine the interaction between unemployment and risky behaviour, they generally concerned countries with relatively low rates of unemployment, of relatively short duration (Germany, the USA, Scandinavian countries, etc.). In France, where the unemployment rate is higher and the average duration of unemployment is longer than a year, the experience of unemployment may feel noticeably different. So the effects measured in other countries are not transposable to France.

In this article, we assess the impact of unemployment on consumption of alcohol and tobacco using data from the ESPS survey over the 2010-2014 period. We deploy a difference-in-difference estimation method with propensity score matching and show that the experience of unemployment does not cause a change in risky behaviour. The rest of this article is structured as follows: Section 1 briefly introduces the differences in health and risk behaviour

between unemployed and employed individuals, then Section 2 details the econometric strategy. Section 3 gives the main results and a sensitivity analysis is provided in Section 4. Then we conclude and present possible further developments.

1. The Gap between the Unemployed and the Employed in Terms of Health and Alcohol and Tobacco Consumption

In order to motivate our study, we present the main differences between unemployed people and those in work as regards their state of health and consumption of alcohol and tobacco, observed on the basis of data from the ESPS survey. The data, the sample and main variables of interest are presented in Box 1.

Figure I shows individuals who were unemployed in 2014 to be in significantly poorer health than those in work[2] (significance level of 5%). While there may be no statistical difference between the two populations in terms of the percentage of individuals drinking alcohol

2. Tests not reported here. Tests on variables observed in 2010 for these two groups are shown in Table 2 (See "Unmatched" sample).

Box 1 – **Data, Sample and Outcome Variables**

Data

The ESPS (*Enquête Santé & Protection Sociale* – a survey on health, access to healthcare and insurance) has been conducted since 1988 by IRDES (Institut de Recherche et Documentation en Économie de la Santé / Institute for Research and Information in Health Economics). The survey collects data on the employment status, state of health and living habits. This is the first longitudinal database providing information simultaneously on work trajectories and consumption of alcohol and tobacco. It is a panel survey that questions the same households every 4 years. The sample was entirely redrawned in 2010 to reduce attrition between the different survey waves. In our study, we use the 2010 and 2014 surveys, which are representative of about 97% of the population living in Metropolitan France.

Sample

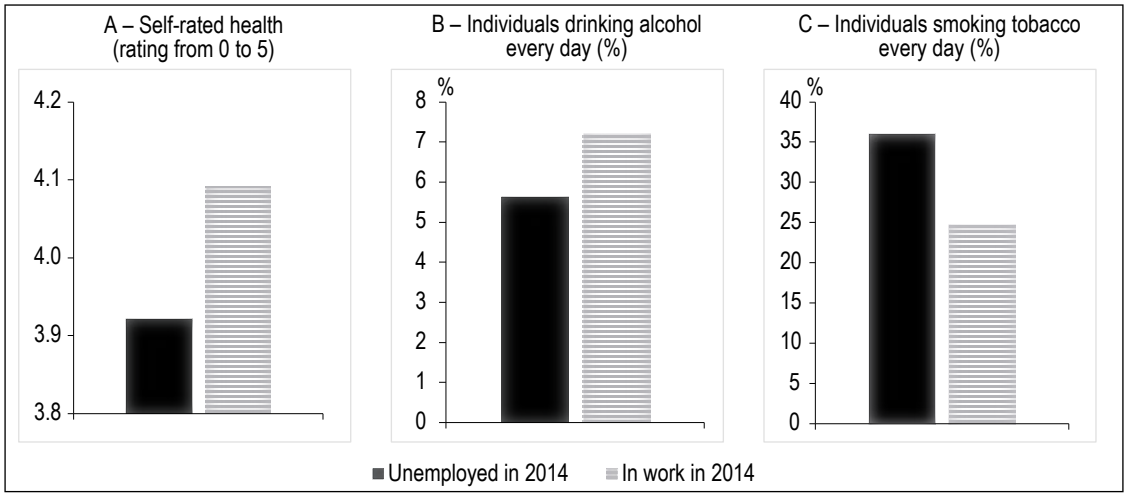
Our sample consists of people in work in 2010, who are either in work or unemployed in 2014. We therefore focus on individuals with a strong attachment to the labour market. Students, pensioners and other inactive individuals are excluded from the analysis, resulting in a sample of 1,540 individuals. We then exclude individuals not in the common support of the distribution of scores (13 individuals). The final sample consists of 1,527 individuals. About 90% of them are in work in 2010 and 2014 (control group) and nearly 10% are in work in 2010 but out of work in 2014 (treated group).

Outcome Variables

Our study examines the impact of the experience of unemployment on short-term health but also on behaviour that is likely to cause a deterioration in health in the longer term. To that end, we make use of three series of outcome variables. The first one relates to health. Firstly, we use the "Self-rated health" variable, based on responses to the following question: "What is your general state of health?" on a scale of 1-5, where 1 = "Very Good", 2 = "Good", 3 = "Quite Good", 4 = "Poor" and 5 = "Very Poor". In the article, we reverse this scale such that 1 is regarded as a "Very Poor" state of health and 5 as a "Very Good" state of health. We also create a dichotomous "Poor Health" variable, equal to 1 if the individual rates their state of health as "Quite good", "Poor" or "Very poor", and equal to 0 if the individual rates their state of health as "Good" or "Very good". Additionally, we use a binary "Depression"[(a)] variable, equal to 1 if the individual stated they had depression and 0 if not. Consequently, we have overall measurements of state of health and a more specific mental health-related measurement. A second series of outcome variables is aimed at analysing alcohol consumption habits. Firstly, we study consumption frequency through the "Drinks every day" ("Drinks occasionally") variable, equal to 1 if the individual consumes alcohol daily (occasionally) and 0 if not. In the second stage, we analyse the amount consumed on a single occasion. The survey allows us to find out if an individual "Has 3 or more drinks per occasion" ("Has 5 or more drinks per occasion"). This variable is equal to 1 if the individual has 3 or more drinks (5 or more drinks) per occasion, and 0 if not. We also add variables on alcohol consumption profiles as defined by IRDES (see Appendix). We differentiate between 3 profile types: "Moderate drinker", with a value of 1 if a man (woman) has 21 (14) or fewer drinks per week and never has 6 or more drinks on any one occasion; "Occasional binge drinker", with a value of 1 if a man (woman) has 21 (14) or fewer drinks per week and has 6 or more drinks on one occasion at least twice a month, and "Chronic binge drinker/alcoholic", with a value of 1 if a man (woman) has more than 21 (14) drinks per week or has 6 or more drinks on one occasion at least once a week. Lastly, a third series of outcome variables relates to tobacco consumption. Firstly, we study consumption frequency through the "Smokes every day" ("Smokes occasionally") variable, equal to 1 if the individual smokes daily (occasionally) and 0 if not. We then observe the amount consumed each day through the "Number of cigarettes smoked" variable. All these outcome variables give an overall view of the impact of the experience of unemployment on health and risky behaviour in terms of alcohol and tobacco consumption.

[(a)] Note that this variable is based on answers to the question: "In the last 12 months, have you had a depression?". It is therefore possible that depression preceded the start of unemployment. The results obtained on the basis of this variable must therefore be interpreted with care.

Figure I – **Self-rated health and daily consumers of alcohol and tobacco in 2014**



Sources: IRDES, 2014 ESPS.

every day, the proportion of daily smokers, on the other hand, is significantly higher (at the 5% level) among the unemployed. But are these differences due to unemployment?

To answer this question, it is necessary to use the survey's longitudinal dimension. Figure II shows, in fact, that individuals who were unemployed in 2014 were already significantly in poorer health in 2010 (significance level of 5%), when they were in work. It is therefore possible that the association between unemployment and poor state of health may be a case of reverse causality. Firstly, because individuals in poor health may have a greater probability of becoming unemployed. Secondly, it is possible that, once they become unemployed, they are characterised by relatively long periods of unemployment. These two arguments increase the probability of observing unemployed individuals in poor health. Similar reasoning applies to the link between, on the one hand, unemployment and alcohol[3] and, on the other, between unemployment and tobacco.[4] The following section presents the econometric strategy used to minimise selection bias and identify the effect of unemployment on health and on risky behaviour.

2. Empirical Strategy

We use a difference-in-difference estimation method with propensity score matching (Box 2) to identify the impact of the experience of unemployment on health and on risky behaviour. This method, which is appropriate to samples of a modest size (Pirracchio *et al*., 2012), consists of matching individuals from the test group and control group on their propensity to be treated, then comparing the average change in the outcome variable for the treated group and the untreated group. Several stages need to be

3. There is no statistical difference (significance level of 5%) in the rates for daily drinkers of alcohol, as measured in 2010, whether in work or unemployed in 2014.

4. There is no statistical difference (significance level of 5%) in the rates for daily cigarette smokers, as measured in 2010, whether in work or unemployed in 2014.

Figure II – **Self-rated health in 2010 and daily consumers of alcohol and tobacco in 2014**

Sources: IRDES, 2010-2014 ESPS.

Box 2 – **Estimation Strategy**

Our sample is made up exclusively of people in work in 2010. Let D be the treatment, with $D=0$ if the individual is in work in 2014 and $D=1$ if the individual is unemployed. Let Y be the outcome variable (state of health, consumption of alcohol or tobacco) with Y^1 the outcome variable for a member of the treatment group and Y^0 the outcome variable for a person in the control group. If we consider $t=2010$ and $t+1=2014$, according to the Difference-in-Difference (DiD) approach, the Average Treatment effect on the Treated (ATT) is determined by comparing the change in outcome variable between t and $t+1$ for the treatment group $E\left(Y_{t+1}^1 - Y_t^1 \mid D=1\right)$ with that for the control group $E\left(Y_{t+1}^0 - Y_t^0 \mid D=1\right)$, that is to say:

$$ATT = E\left(Y_{t+1}^1 - Y_t^1 \mid D=1\right) - E\left(Y_{t+1}^0 - Y_t^0 \mid D=0\right)$$

Under the two-group common trend assumption, which assumes that, in the absence of treatment, the individuals in the treatment group and those in the control group would have a similar change in their outcome variables, then:

$$E\left(Y_{t+1}^0 - Y_t^0 \mid D=1\right) = E\left(Y_{t+1}^0 - Y_t^0 \mid D=0\right)$$

There are several advantages to the difference-in-difference approach. The first difference, consisting on one side of the equation of $E\left(Y_{t+1}^1 - Y_t^1 \mid D=1\right)$ and on the other of $E\left(Y_{t+1}^0 - Y_t^0 \mid D=0\right)$ allows individual fixed effects to be eliminated, while the second difference $E\left(Y_{t+1}^1 - Y_t^1 \mid D=1\right) - E\left(Y_{t+1}^0 - Y_t^0 \mid D=0\right)$ allows common temporal effects to be eliminated. However, in our case it is not possible to apply the difference-in-difference approach directly as treatment allocation is not random. Indeed, Table 1 shows, for example, that the youngest individuals, those on fixed-term contracts and people in poor health in 2010 have a higher probability of being unemployed in 2014. One possible identification strategy consists of assuming that, given a set of observable characteristics X, the outcome variables are independent of treatment allocation. This conditional independence assumption is written as follows:

$$Y^0, Y^1 \perp D \mid X$$

Consequently, it is possible to estimate the ATT by comparing the change in outcome variables between t and $t+1$ of treated and untreated individuals with the same observable characteristics X (Heckman *et al.*, 1998). In order to reduce selection bias, it is preferable to carry out matching on many characteristics that may affect treatment participation. However, as the number of characteristics determining access to treatment rises, it becomes increasingly difficult to find two individuals with exactly the same characteristics. To solve this problem, Rosenbaum & Rubin (1983) propose matching treated and untreated individuals according to a one-dimensional summary called the "propensity score", representing the probability of treatment participation, given a set of observable characteristics X. In this way, they show that, if outcome variable Y is independent of participation in treatment D conditional on the observable characteristics X, it is also independent of D conditional on the propensity score $P(X)$, so:

$$Y^0, Y^1 \perp D \mid P(X)$$

under the common support assumption:

$$0 < P(X) < 1$$

This condition makes it possible to ensure that, for each treated individual, there is at least one untreated individual with the same propensity score (Heckman *et al.*, 1998). So, we can minimise selection bias through Propensity Score Matching (PSM). Under the common trend, conditional independence and common support assumptions, we can thus estimate the ATT for individuals in the common support of the distribution of scores, by combining DiD and PSM, that is to say:

$$ATT^{DiD-PSM} \frac{1}{N_{D_1}} \sum_{i \in D_1 \cap S} \left[\left(Y_{i,t+1}^1 - Y_{i,t}^1\right) - \sum_{j \in D_0 \cap S} w_{ij} \left(Y_{j,t+1}^0 - Y_{j,t}^0\right) \right]$$

Where D_1 (D_0) is the treatment group (control group), N the number of treated individuals and S the area of common support. The term w_{ij} represents the weight assigned to the member of the control group with a propensity score close to that of the treated individual, known as "Near Neighbor".

followed to make the estimation credible. Firstly, the propensity score has to be determined, based on a Logit or Probit model, using treatment participation as the dependent variable and all the observable characteristics that may affect treatment participation as independent variables. You then have to ensure that the area of common support for the distribution of the propensity score of both groups is sufficiently broad. Next, a matching algorithm must be selected to match each participant in the programme with the non-participant who appears to have the most similarities. It is then necessary to check that the treatment group and control group display similar average observable characteristics. If matching allows the two groups to be compared, the average treatment effect on the treated (ATT) can then be estimated.

2.1. Propensity Score

The propensity score, i.e. the probability of participating in treatment given a set of

observable variables X, is determined with a Probit model, using treatment participation as the dependent variable (Imbens & Wooldridge, 2009). In order for the conditional independence assumption to be credible, the estimation of the propensity score must include all the variables that may have a significant influence on treatment participation (Table 1). The explanatory variables we use are measured in 2010, prior to treatment allocation, so as to avoid endogeneity problems. Here we select: age, age squared, gender, level of education, marital status, household income, socio-professional category (CSP), business sector and company size, contract type, and variables related to the state of health and the consumption of alcohol and tobacco. Estimating the propensity score enables us to minimise selection bias, whilst including a lagged dependent variable allows us to deal with the problem of reverse causality.

2.2. Quality of the Propensity Score

Use of the propensity score must allow balancing of the distribution of all observable characteristics included when estimating the propensity score $P(X)$. Following estimation, we ensure this balance is verified: we divide the distribution of the propensity score into 10 strata and check, for each of the strata, that there is no statistical difference between the two groups in terms of the average values of the explanatory variables.

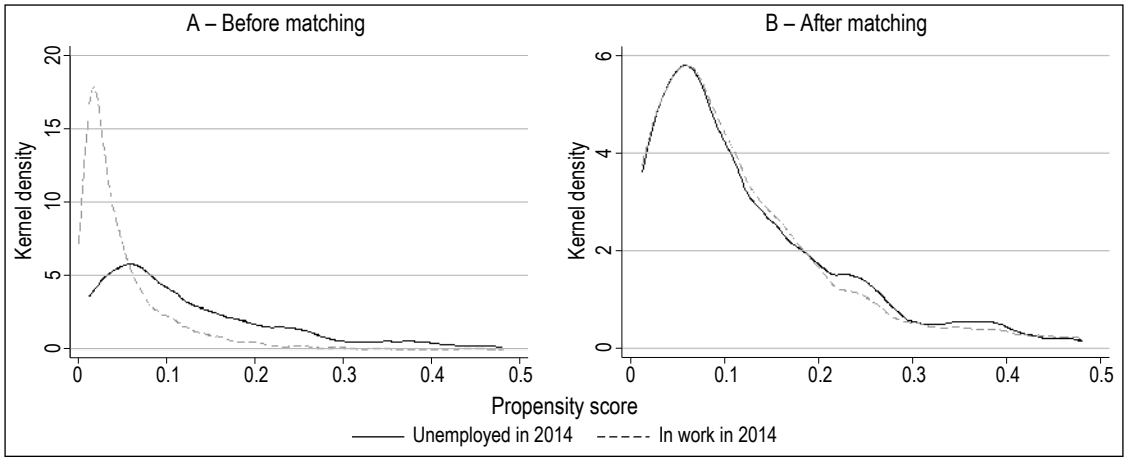
Moreover, use of the propensity score is only appropriate for individuals in the common support of the distribution of scores. Figure III (left side) shows that, prior to matching, the area of common support is relatively broad (Lechner, 2002). We adopt the Min-Max method suggested by Dehejia & Wahba (2002), which consists of retaining only those individuals for whom there

Table 1 – **Probit model**

	Coefficient	Standard Error
Age	-0.1838***	0.0622
Age²	0.0023***	0.0009
Male *(ref. Female)*	-0.2104	0.1287
Education level *(ref. Tertiary)*		
Primary	0.0205	0.4404
Lower secondary	-0.0175	0.1687
Upper secondary	-0.1936	0.1740
Married *(ref. Unmarried)*	-0.1679	0.1278
Household Income *(ref. > €4,600)*		
< €1,300	0.0823	0.2485
€1,300 - €4,600	-0.1109	0.1846
Socio-Professional Category *(ref. Other)*		
Clerical, sales & services/blue-collar	0.0872	0.2151
Middle-level occupation	-0.2020	0.2223
Sector *(ref. Other)*		
Agriculture, forestry, fishing	-0.1276	0.4198
Industry	0.2653	0.1793
Construction	0.3123	0.2375
Trade and services	0.2063	0.1472
Company size *(ref. 20 or more employees)*		
Less than 10 employees	0.5291***	0.1623
Between 10 and 19 employees	0.5847***	0.2020
Permanent contract *(ref. Fixed-term)*	-0.3458**	0.1419
State of Health		
Self-rated health	-0.2073***	0.0794
Alcohol consumption *(ref. None)*		
Drinks every day	-0.1877	0.2768
Drinks occasionally	-0.3059**	0.1372
Tobacco consumption *(ref. None)*		
Smokes every day	0.2045	0.1256
Smokes occasionally	0.2225	0.2432
Number of observations	1,540	

Notes: All variables are measured in 2010, prior to treatment allocation. Significance levels: 10% (*), 5% (**), 1% (***).
Sources: IRDES, ESPS 2010.

Figure III – **Distribution of the propensity score, before and after matching**



Sources: IRDES, 2010-2014 ESPS.

is a counterfactual. Consequently, individuals whose score is lower than the minimum value or higher than the maximum value of the score in the other group are excluded from the analysis.[5]

2.3. Matching

Each member of the treatment group is then matched with one or more members of the control group with a similar propensity score, referred to as "near neighbors". This matching process may involve several methods. Matching algorithms differ not only in the way in which near neighbors are defined but also in the weight assigned to each near neighbor. First, we match using the Nearest Neighbor method. So each treated individual is matched with 5 members of the control group with the closest propensity score. However, this method, which is frequently used in the literature, may result in bad matches, notably when the nearest neighbors are relatively distant in terms of propensity score. This problem can be solved by setting a maximum propensity score distance, known as "Caliper". Baser (2006) and Caliendo & Kopeinig (2008) show that Caliper matching can significantly reduce selection bias. However, as Smith & Todd (2005) emphasise, the choice of Caliper represents a notable limitation in this approach. Here we rely on the work by Austin (2011) to determine the optimal Caliper size. Lastly, we test the robustness of our matching using a Kernel estimator (Heckman *et al*., 1998). So each individual in the control group participates in the construction of the counterfactual of a treated individual, with a weighting that is dependent on the distance between their propensity score and the score of the individual under consideration. Consequently, individuals in the control group with a closer propensity score, relatively speaking, are given a higher weighting. This method helps to reduce variance as more information is used. The ATT (average treatment effect on the treated, see Box 2) is then estimated for each of these matching algorithms (Nearest Neighbor, Caliper and Kernel).

2.4. Quality of Matching

The final stage consists in examining the extent to which use of the propensity score helps reduce selection bias. Figure III shows the distribution of the propensity score, before and after matching, for individuals who have become unemployed (treatment group) and for those still in work in 2014 (control group). While the chart on the left reveals a marked difference in the distribution of the score for the two groups before matching, the chart on the right shows that the distribution of the propensity score becomes similar in both groups after matching. In other words, matching seems to have made individuals in the treatment group comparable with those in the control group. The quality of matching may be assessed firstly by comparing the average characteristics within both groups before and after matching (Rosenbaum & Rubin, 1985a; 1985b). Table 2 shows that the differences initially observed between treated and untreated individuals are no longer significant once the matching is done. Additionally, it is possible to determine the reduction in bias initially observed (Caliendo & Kopeinig, 2008). The bias corresponds to the difference in averages between treated and untreated individuals, divided by the common standard deviation of the sample. The reduction in bias is determined by a comparison between

5. As the area of common support is particularly broad, the Min-Max method leads us to exclude only 13 individuals from the analysis. Our final sample therefore consists of 1,527 individuals.

the bias calculated for the matched sample and then the unmatched sample. Table 2 shows that matching led to a considerable reduction in bias for all the characteristics for which significant differences in average were initially observed between the two groups.

3. Results

We now compare the change in the outcome variables between t and $t+1$ for individuals in the treatment group and members of the control group. First, we analyse the effect of unemployment on health and then the impact of unemployment on consumption of alcohol and tobacco. In this way, we explore the effects of unemployment on short-term health but also on behaviour that is likely to cause a deterioration in health in the longer term. To measure the state of health, we use the three outcome variables described in Box 1: firstly, individuals' self-rated health, on a scale of 1 to 5 ("1" being the poorest state of health and "5" the best).

Table 2 – **Average characteristics in 2010 of unemployed individuals and people in work in 2014, before and after matching**

	Sample	Unemployed in 2014	In work in 2014	Difference	Bias (%)	Reduction in bias (%)
Age	Unmatched	35.24	38.57	-3.33***	-38.8	
	Matched	35.28	35.38	-0.10	-1.2	96.9
Age²	Unmatched	1331	1545	-214***	-34.6	
	Matched	1334	1329	5	0.9	97.5
Male *(ref. Female)*	Unmatched	0.4494	0.5017	-0.0523	-10.5	
	Matched	0.4419	0.4767	-0.0348	-7.0	33.3
Education level *(ref. Tertiary)*						
Primary	Unmatched	0.0225	0.1370	-0.1145	6.6	
	Matched	0.0233	0.0233	0.0000	0.0	100
Lower Secondary	Unmatched	0.4607	0.3587	0.1020*	20.8	
	Matched	0.4535	0.5465	-0.0930	-19.0	8.8
Upper Secondary	Unmatched	0.2360	0.2409	-0.0049	-1.2	
	Matched	0.2326	0.1977	0.0349	8.2	-601.1
Married *(ref. Unmarried)*	Unmatched	0.4607	0.6660	-0.2053***	-42.2	
	Matched	0.4767	0.5581	-0.0814	-16.7	60.4
Household Income *(ref. > €4,600)*						
< €1,300	Unmatched	0.1512	0.0680	0.0832***	26.8	
	Matched	0.1512	0.1279	0.0233	7.5	72
€1,300 - €4,600	Unmatched	0.7326	0.7890	-0.0564	-13.2	
	Matched	0.7326	0.7093	0.0233	5.4	58.8
Socio-Professional Category *(ref. Executives)*						
Clerical, sales & services/blue-collar	Unmatched	0.7640	0.5750	0.1890***	40.9	
	Matched	0.7558	0.7558	0.0000	0.0	100
Middle-level occupation	Unmatched	0.1461	0.2663	-0.1202**	-30.0	
	Matched	0.1512	0.1628	-0.0116	-2.9	90.3
Sector *(ref. Other)*						
Agriculture, forestry, fishing	Unmatched	0.0225	0.0200	0.0025	1.8	
	Matched	0.0233	0.0116	0.0117	8.1	-343.4
Industry	Unmatched	0.1573	0.1789	-0.0216	-5.7	
	Matched	0.1628	0.2093	-0.0465	-12.4	-117.9
Construction	Unmatched	0.1011	0.0623	0.0388	14.2	
	Matched	0.1047	0.0814	0.0233	8.5	40.1
Trade and services	Unmatched	0.4270	0.3381	0.0889	18.3	
	Matched	0.4186	0.4186		0.0	100
Company size *(ref. 20 or more employees)*						
Less than 10 employees	Unmatched	0.2360	0.1027	0.1333***	36.0	
	Matched	0.2326	0.2093	0.0233	6.3	82.6
Between 10 and 19 employees	Unmatched	0.1236	0.0479	0.0757***	27.2	
	Matched	0.1279	0.1512	-0.0233	-8.3	69.3
Permanent contract *(ref. Fixed-term)*	Unmatched	0.6629	0.8200	-0.1571***	-36.3	
	Matched	0.6628	0.6861	-0.0233	-5.4	85.2 →

Table 2 – *(contd.)*

	Sample	Unemployed in 2014	In work in 2014	Difference	Bias (%)	Reduction in bias (%)
State of Health						
Self-rated health	Unmatched	3.8764	4.0705	-0.1941**	-24.9	
	Matched	3.8837	3.8256	0.0581	7.5	70
Alcohol consumption *(ref. None)*						
Drinks every day	Unmatched	0.0449	0.0561	-0.0112	-5.1	
	Matched	0.0465	0.0233	0.0232	10.6	-108
Drinks occasionally	Unmatched	0.6742	0.7680	-0.0938*	-21.0	
	Matched	0.6861	0.6163	0.0698	15.6	25.6
Tobacco consumption *(ref. None)*						
Smokes every day	Unmatched	0.4157	0.2813	0.1344**	28.4	
	Matched	0.3954	0.4070	-0.0117	-2.5	91.3
Smokes occasionally	Unmatched	0.0674	0.0540	0.0134	5.6	
	Matched	0.0698	0.1163	-0.0465	-19.4	-248.6
Number of observations	1,527					

Notes: See Table 1.
Sources: IRDES, ESPS 2010-2014.

Following Böckerman & Ilmakunnas (2009) and Gebel & Voßemer (2014), we regard self-rated health as a cardinal measure and we estimate the ATT. Although this is a subjective measure of the state of health, several studies have demonstrated the ability of this scale to reflect individuals' objective state of health and its predictive value in terms of morbidity and mortality (Burström & Fredlund, 2001; Connelly *et al*., 1989; Franks *et al*., 2003; Grant *et al*., 1995; Idler & Angel, 1990; Idler & Benyamini, 1997; Idler & Kasl, 1995; Lundberg & Manderbacka, 1996; McCallum *et al*., 1994; Okun *et al*., 1984). Additionally, we use a "Poor health" variable, equal to 1 if the individual rates their state of health as "Quite good", "Poor" or "Very poor", and equal to 0 if the individual rates their state of health as "Good" or "Very good". In this way, we measure the effect of unemployment on self-rated health and on the probability of being in poor health. We also use a third outcome variable, "Depression", equal to 1 if the individual states they have had depression and 0 if not. This last variable enables us to assess the effect of unemployment on mental health. Regardless of the health variable used, our estimates show that, in the case of France, the experience of unemployment has no significant impact on health, at least in the short term. (Table 3-A).

We then examine the impact of unemployment on behaviour in terms of consumption of alcohol and tobacco. Alcohol consumption can be assessed from different perspectives. Firstly, we estimate the effect of unemployment on the probability of drinking alcohol, whether on a daily basis or occasionally (Table 3-B). In the former case, the ATT are close to 0 and non-significant, which implies that the experience of unemployment has no effect on the probability of consuming alcohol on a daily basis. In the case of occasional consumption, the ATT are significant only at a significance level of 10% with the nearest neighbor or Kernel matching, and at a significance level of 5% with Caliper matching.

Although the experience of unemployment may have moderate effects on frequency of consumption, it may possibly lead, however, to a substantial change in the volume consumed on each occasion. We examine whether becoming unemployed had an impact on the probability of having three or more drinks and then on the probability of having five or more drinks on a single occasion. We do not identify any significant effect. Lastly, we analyse the impact of unemployment on alcohol consumption profiles as defined by IRDES (see Appendix). We thus differentiate between non-drinkers of alcohol, moderate drinkers, occasional binge drinkers and chronic binge drinkers/alcoholics. Our estimation show that unemployment causes a slight reduction in moderate consumption, only significant at a significance level of 10% with the nearest neighbor matching (Table 3-C). While unemployment may lead to a change in alcohol consumption practices, it only seems to influence behaviour that poses a low risk to health.

We now turn to the impact of unemployment on smoking. This issue is central to our analysis, on the one hand because tobacco is the primary cause of premature mortality in France and, on the other, because our unmatched data indicated that daily smokers represent a significantly

Table 3 – **Average treatment effect on the treated (ATT)**

A – Outcome variable: Health

Treatment	Matching algorithm	Dependent Variable		
		Self-rated health	Poor health	Depression
Unemployment in 2014	Nearest Neighbor	-0.0349	0.1047	0.0233
		(0.1288)	(0.0757)	(0.0506)
	Caliper	-0.0238	0.1071	0.0357
		(0.1283)	(0.0758)	(0.0501)
	Kernel	-0.0358	0.0813	-0.0026
		(0.1007)	(0.0557)	(0.0362)

B – Outcome variable: Alcohol consumption, quantity

Treatment	Matching algorithm	Dependent Variable			
		Drinks every day	Drinks occasionally	Has 3 or more drinks per occasion	Has 5 or more drinks per occasion
Unemployment in 2014	Nearest Neighbor	-0.0350	-0.1163*	-0.0814	0.0698
		(0.0832)	(0.0599)	(0.0643)	(0.0436)
	Caliper	-0.0238	-0.1190**	-0.0833	0.0714
		(0.0841)	(0.0609)	(0.0652)	(0.0442)
	Kernel	-0.0240	-0.0741*	-0.0389	0.0376
		(0.0634)	(0.0432)	(0.0436)	(0.0247)

C – Outcome variable: Alcohol consumption, type of drinker

Treatment	Matching algorithm	Dependent Variable		
		Moderate drinker	Occasional binge drinker	Chronic binge drinker / alcoholic
Unemployment in 2014	Nearest Neighbor	-0.0814**	-0.0233	-0.0116
		(0.0775)	(0.0764)	(0.0440)
	Caliper	-0.0833	-0.0357	0.0001
		(0.0788)	(0.0766)	(0.0428)
	Kernel	-0.0744	-0.0640	0.0471
		(0.0596)	(0.0561)	(0.0300)

D – Outcome variable: Tobacco consumption

Treatment	Matching algorithm	Dependent Variable		
		Smokes every day	Smokes occasionally	Number of cigarettes smoked
Unemployment in 2014	Nearest Neighbor	-0.0465	0.0465	-1.7209*
		(0.0544)	(0.0456)	(0.9412)
	Caliper	-0.0476	0.0476	-1.9762**
		(0.0554)	(0.0464)	(0.9519)
	Kernel	0.0098	-0.0235	-0.2067
		(0.0440)	(0.0347)	(0.7825)

Notes: Number of observations = 1,527. Standard errors, shown in brackets, obtained by bootstrap (100 replications). Significance levels: 10% (*), 5% (**), 1% (***).
Sources: IRDES, ESPS 2010-2014.

higher proportion of the unemployed population than of people in work. As before, we examine the impact on the proportion of consumers and then on the amount consumed. Our results suggest that the experience of unemployment has no significant impact on the probability of smoking daily or occasionally (Table 3-D). Moreover, unemployment has a negative effect on the number of cigarettes smoked. This reduction in amount of tobacco smoked might be partly explained by the drop in income caused by job loss. However, the effects do not withstand a change in matching algorithm and are not significant with a kernel estimator.

4. Sensitivity Analysis

Special attention must be paid to the assumption of conditional independence, as emphasised by Bléhaut & Rathelot (2014). Indeed, matching methods are based on the assumption that the underlying results and treatment allocation are independent conditional on a set of observable variables X, i.e.:

$$Y^0, Y^1 \perp D|X$$

In this section, we propose assessing the sensitivity of our estimates to a deviation from the conditional independence assumption. For that,

we follow the method suggested by Ichino *et al*., (2008). Let us suppose that the conditional independence assumption is no longer met but that it would be, given a set of observable variables X and an unobserved binary variable U.

$$Y^0, Y^1 \perp D \,|\, (X,U)$$

In this case, if we know U, it is possible to estimate the ATT. The distribution of the unobserved binary variable U is characterised by specifying the following four parameters:

$$p_{mn} = \Pr(U = 1 \,|\, D = m,\ Y = n)$$
$$= \Pr(U = 1 \,|\, D = m,\ Y = n, X)$$

with $m,n \in \{0,1\}$, which gives the probability that $U = 1$ in each of the 4 groups defined by treatment variable D and outcome variable Y. Given the parameters p_{mn}, a value of U is attributed to each individual, depending on the group to which they belong. U is then included in the set of variables for determining the propensity score and the ATT is then estimated using the nearest neighbor method. This process is repeated 1,000 times to determine an average ATT out of the whole distribution of U.

The effect of U on the outcome variable for untreated individuals (Y^0) is defined as follows:

$$\Gamma = \frac{\Pr(Y = 1 \,|\, D = 0,\ U = 1, X)}{\Pr(Y = 0 \,|\, D = 0,\ U = 1, X)} \Big/ \frac{\Pr(Y = 1 \,|\, D = 0,\ U = 0, X)}{\Pr(Y = 0 \,|\, D = 0,\ U = 0, X)}$$

and the effect of U on selection in treatment (D) is determined as follows:

$$\Lambda = \frac{\Pr(D = 1 \,|\, U = 1, X)}{\Pr(D = 0 \,|\, U = 1, X)} \Big/ \frac{\Pr(D = 1 \,|\, U = 0, X)}{\Pr(D = 0 \,|\, U = 0, X)}$$

Our study includes 13 outcome variables and 3 distinct matching methods. For the sake of clarity, we present here the sensitivity analysis conducted for 2 outcome variables ("Smokes every day" and "Drinks every day") with a single matching method (Nearest Neighbor). Note that similar results are obtained on other outcome variables used in this study, including when alternative matching methods are used (Caliper and Kernel).

The results are shown in Tables 4 and 5. In each table, the first line indicates the estimated ATT and standard error in the baseline case, i.e. without simulated confounding factor.

Table 4 – **Sensitivity analysis of the average treatment effect on the treated (ATT)**
Outcome variable: "Smokes every day", matching algorithm: Nearest Neighbor

	p_{ij}				*ATT*	*SE*	*Γ*	*Λ*
	p_{11}	p_{10}	p_{01}	p_{00}				
Without simulated confounding factor (Ref)	0	0	0	0	-0.047	0.054	-	-
Male *(ref. Female)*	0.46	0.40	0.50	0.50	-0.047	0.054	1.035	0.816
Education level *(ref. Tertiary)*								
Primary	0.03	0.00	0.01	0.02	-0.047	0.054	0.661	1.924
Lower secondary	0.44	0.60	0.36	0.33	-0.047	0.054	1.134	1.567
Upper secondary	0.24	0.20	0.23	0.33	-0.047	0.054	0.591	0.999
Married *(ref. Unmarried)*	0.46	0.50	0.67	0.58	-0.047	0.054	1.487	0.448
Household Income *(ref. > €4,600)*								
< €1,300	0.14	0.25	0.07	0.07	-0.047	0.054	1.129	2.564
€1,300 - €4,600	0.74	0.63	0.78	0.86	-0.047	0.054	0.607	0.782
Socio-Professional Category *(ref. Other)*								
Clerical, sales & services/blue-collar	0.77	0.70	0.57	0.68	-0.047	0.054	0.613	2.565
Middle-level occupation	0.14	0.20	0.27	0.22	-0.047	0.054	1.357	0.447
Sector *(ref. Other)*								
Agriculture, forestry, fishing	0.03	0.00	0.02	0.01	-0.047	0.054	1.790	1.451
Industry	0.15	0.20	0.18	0.19	-0.047	0.054	0.917	0.863
Construction	0.11	0.00	0.06	0.05	-0.047	0.054	1.853	1.782
Trade and services	0.41	0.60	0.34	0.30	-0.047	0.054	1.255	1.496
Company size *(ref. 20 or more employees)*								
Less than 10 employees	0.22	0.40	0.10	0.11	-0.047	0.054	0.980	2.823
Between 10 and 19 employees	0.13	0.10	0.05	0.04	-0.047	0.054	1.922	2.895
Permanent contract *(ref. Fixed-term)*	0.66	0.70	0.82	0.80	-0.047	0.054	1.183	0.453 →

Table 4 – *(contd.)*

	p_{ij}				*ATT*	*SE*	*Γ*	*Λ*
	p_{11}	p_{10}	p_{01}	p_{00}				
Alcohol consumption *(ref. None)*								
Drinks every day	0.05	0.00	0.05	0.09	-0.047	0.054	0.659	0.793
Drinks occasionally	0.68	0.60	0.77	0.77	-0.047	0.054	0.986	0.660
Tobacco consumption *(ref. None)*								
Smokes every day	0.34	1.00	0.23	1.00	-0.047	0.054		1.829
Smokes occasionally	0.08	0.00	0.06	0.00	-0.047	0.054		1.174
Number of observations	1,527							

Notes: See Table 1.
Sources: IRDES, ESPS 2010-2014.

Table 5 – **Sensitivity analysis of the average treatment effect on the treated (ATT)**
Outcome variable: "Drinks every day", matching algorithm: Nearest Neighbor

	p_{ij}				*ATT*	*SE*	*Γ*	*Λ*
	p_{11}	p_{10}	p_{01}	p_{00}				
Without simulated confounding factor (Ref)	0	0	0	0	-0.035	0.083	-	-
Male *(ref. Female)*	0.45	0.45	0.48	0.51	-0.035	0.083	0.890	0.867
Education level *(ref. Tertiary)*								
Primary	0.00	0.03	0.03	0.01	-0.035	0.083	5.129	1.944
Lower secondary	0.68	0.34	0.42	0.34	-0.035	0.083	1.451	1.561
Upper secondary	0.23	0.24	0.26	0.23	-0.035	0.083	1.154	0.980
Married *(ref. Unmarried)*	0.55	0.41	0.63	0.68	-0.035	0.083	0.798	0.439
Household Income *(ref. > €4,600)*								
< €1,300	0.10	0.18	0.10	0.06	-0.035	0.083	1.957	2.480
€1,300 - €4,600	0.79	0.70	0.77	0.80	-0.035	0.083	0.882	0.773
Socio-Professional Category *(ref. Other)*								
Clerical, sales & services/blue-collar	0.81	0.74	0.65	0.55	-0.035	0.083	1.553	2.476
Middle-level occupation	0.16	0.14	0.23	0.28	-0.035	0.083	0.737	0.466
Sector *(ref. Other)*								
Agriculture, forestry, fishing	0.00	0.03	0.02	0.02	-0.035	0.083	0.924	1.364
Industry	0.16	0.16	0.16	0.18	-0.035	0.083	0.833	0.831
Construction	0.10	0.10	0.08	0.06	-0.035	0.083	1.362	1.682
Trade and services	0.35	0.47	0.32	0.34	-0.035	0.083	0.908	1.477
Company size *(ref. 20 or more employees)*								
Less than 10 employees	0.16	0.28	0.10	0.10	-0.035	0.083	0.946	2.870
Between 10 and 19 employees	0.06	0.16	0.05	0.05	-0.035	0.083	0.937	2.712
Permanent contract *(ref. Fixed-term)*	0.71	0.64	0.82	0.82	-0.035	0.083	1.030	0.443
Alcohol consumption *(ref. None)*								
Drinks every day	0.13	0.00	0.21	0.00	-0.035	0.083	.	0.841
Drinks occasionally	0.06	1.00	0.14	1.00	-0.035	0.083	.	0.626
Tobacco consumption *(ref. None)*								
Smokes every day	0.42	0.41	0.32	0.27	-0.035	0.083	1.281	1.844
Smokes occasionally	0.03	0.09	0.03	0.06	-0.035	0.083	0.457	1.181
Number of Observations	1,527							

Notes: See Table 1.
Sources: IRDES, ESPS 2010-2014.

In the other lines of the table, the distribution of U is assumed to be comparable to that of other observable variables, such as gender, education, marital status, household income, socio-professional category, business sector and workforce size, contract type, and alcohol and tobacco consumption habits as observed in 2010, i.e. prior to treatment. In all the envisaged configurations, the average treatment effect on the treated (ATT) and standard errors (SE) do not differ from the baseline estimation. All these elements suggest that the results presented in this study withstand a deviation from the conditional independence assumption.

* *
*

The objective of this article is to estimate the impact of the experience of unemployment on individuals' consumption of alcohol and tobacco and, more especially, on risky behaviour. To this end, we use the ESPS survey, which simultaneously gathers panel data on work situation, state of health and consumption of alcohol and tobacco, for the 2010-2014 period. Although a strong association may be observed between unemployment and consumption of alcohol and tobacco with cross-section data, this relationship disappears when using longitudinal data and a difference-in-difference estimation method with propensity score matching to reduce selection bias. Our results suggest that there is little probability of unemployment causing any significant increase in risky behaviour.

This article makes several contributions to the analysis of interaction between work and health. Firstly, it demonstrates the need, in this field of research, to use the data's longitudinal dimension to assess causal effects. It also sheds new light on the causal effect of unemployment on state of health and risky behaviour. While our results appear to be robust, certain limitations must nevertheless be mentioned. Indeed, our study is based on two survey waves, over a 4-year interval. Therefore, we cannot capture all the changes in work status between the two waves of questioning and can only assess the experience of unemployment from a limited perspective. It would be interesting, for example, to analyse the role of the duration of unemployment on consumption of alcohol and tobacco.

This work opens the way to questions that have not yet been explored much in France. Indeed, variables such as physical exercise or dietary habits, not studied in this article, may be influenced by the experience of unemployment and may affect health in the longer term. The development of new, richer longitudinal databases, over a longer timescale, may provide a better understanding of the effect of unemployment on health and expand on the results found. □

BIBLIOGRAPHY

Acheson, A., Mahler, S. V., Chi, H. & De Wit, H. (2006). Differential effects of nicotine on alcohol consumption in men and women. *Psychopharmacology*, 186(1), 54. https://doi.org/10.1007/s00213-006-0338-y

Ahmed, F. M. A. & Peeran, S. W. (2016). Significance and determinants of tobacco use: A brief review. *Dentistry and Medical Research*, 4(2), 33. https://doi.org/10.4103/2348-1471.184726

Ahn, N., García, J. R. & Jimeno, J. F. (2004). The impact of unemployment on individual well-being in the EU. European Network of Economic Policy Research Institutes, *Working Paper* N° 29. https://www.ceps.eu/ceps-publications/impact-unemployment-individual-well-being-eu/

Anderson, P., Cremona, A., Paton, A., Turner, C. & Wallace, P. (1993). The risk of alcohol. *Addiction*, 88(11), 1493–1508. https://doi.org/10.1111/j.1360-0443.1993.tb03135.x

Austin, P. C. (2011). Optimal caliper widths for propensity-score matching when estimating differences in means and differences in proportions in observational studies. *Pharmaceutical Statistics*, 10(2), 150–161. https://doi.org/10.1002/pst.433

Barnay, T. & Defebvre, É. (2016). L'influence de la santé mentale déclarée sur le maintien en emploi. *Économie et Statistique*, 486-487, 45–78. https://www.insee.fr/fr/statistiques/2110917?sommaire=2110927

Barrett, S. P., Tichauer, M., Leyton, M. & Pihl, R. O. (2006). Nicotine increases alcohol self-administration in non-dependent male smokers. *Drug and Alcohol Dependence*, 81(2), 197–204. https://doi.org/10.1016/j.drugalcdep.2005.06.009

Bartley, M. & Owen, C. (1996). Relation between socioeconomic status, employment, and health during economic change, 1973-93. *British Medical Journal*, 313(7055), 445–449. https://doi.org/10.1136/bmj.313.7055.445

Baser, O. (2006). Too much ado about propensity score models? Comparing methods of propensity score matching. *Value in Health*, 9(6), 377–385. https://doi.org/10.1111/j.1524-4733.2006.00130.x

Batenburg, M. & Reinken, J. A. (1990). The relationship between sickness absence from work and pattern of cigarette smoking. *The New Zealand Medical Journal*, 103(882), 11–13. https://europepmc.org/article/med/2360925

Bjartveit, K. & Tverdal, A. (2005). Health consequences of smoking 1–4 cigarettes per day. *Tobacco Control*, 14(5), 315–320. http://dx.doi.org/10.1136/tc.2005.011932

Blasco, S. & Brodaty, T. (2016). Chômage et santé mentale en France. *Économie et Statistique*, 486, 17–44. https://www.insee.fr/fr/statistiques/2110915?sommaire=2110927

Bléhaut, M. & Rathelot, R. (2014). Expérimentation contrôlée contre appariement : le cas d'un dispositif d'accompagnement de jeunes diplômés demandeurs d'emploi. *Économie et prévision*, 204-205, 163–181. https://doi.org/10.3917/ecop.204.0163

Böckerman, P. & Ilmakunnas, P. (2009). Unemployment and self-assessed health: evidence from panel data. *Health Economics*, 18(2), 161–179. https://doi.org/10.1002/hec.1361

Browning, M., Moller Dano, A. & Heinesen, E. (2006). Job displacement and stress-related health outcomes. *Health Economics*, 15(10), 1061–1075. https://doi.org/10.1002/hec.1101

Browning, M. & Heinesen, E. (2012). Effect of job loss due to plant closure on mortality and hospitalization. *Journal of Health Economics*, 31(4), 599–616. https://doi.org/10.1016/j.jhealeco.2012.03.001

Burgard, S. A., Brand, J. E. & House, J. S. (2007). Toward a better estimation of the effect of job loss on health. *Journal of Health and Social Behavior*, 48(4), 369–384. https://doi.org/10.1177/002214650704800403

Burström, B. & Fredlund, P. (2001). Self-rated health: Is it as good a predictor of subsequent mortality among adults in lower as well as in higher social classes? *Journal of Epidemiology & Community Health*, 55(11), 836–840. http://dx.doi.org/10.1136/jech.55.11.836

Caliendo, M. & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys*, 22(1), 31–72. https://doi.org/10.1111/j.1467-6419.2007.00527.x

Classen, T. J. & Dunn, R. A. (2012). The effect of job loss and unemployment duration on suicide risk in the United States: A new look using mass-layoffs and unemployment duration. *Health Economics*, 21(3), 338–350. https://doi.org/10.1002/hec.1719

Com-Ruelle, L. & Célant, N. (2013). Évolution de la prévalence des différents profils d'alcoolisation chez les adultes en France de 2002 à 2010. *Bulletin épidémiologique hebdomadaire*, 16-17, 18. https://www.santepubliquefrance.fr/determinants-de-sante/alcool/documents/article/evolution-de-la-prevalence-des-differents-profils-d-alcoolisation-chez-les-adultes-en-france-de-2002-a-2010

Connelly, J. E., Philbrick, J. T., Smith Jr, G. R., Kaiser, D. L. & Wymer, A. (1989). Health perceptions of primary care patients and the influence on health care utilization. *Medical Care*, S99-S109. https://doi.org/10.1097/00005650-198903001-00009

Connor, J. (2017). Alcohol consumption as a cause of cancer. *Addiction*, 112(2), 222–228. https://doi.org/10.1111/add.13477

Danaei, G., Ding, E. L., Mozaffarian, D., Taylor, B., Rehm, J., Murray, C. J. & Ezzati, M. (2009). The preventable causes of death in the United States: comparative risk assessment of dietary, lifestyle, and metabolic risk factors. *PLoS Medicine*, 6(4), e1000058. https://doi.org/10.1371/annotation/0ef47acd-9dcc-4296-a897-872d182cde57

De Leon, J., Rendon, D. M., Baca-Garcia, E., Aizpuru, F., Gonzalez-Pinto, A., Anitua, C. & Diaz, F. J. (2007). Association between smoking and alcohol use in the general population: stable and unstable odds ratios across two years in two different countries. *Alcohol and Alcoholism*, 42(3), 252–257. https://doi.org/10.1093/alcalc/agm029

Dee, T. S. (1999). The complementarity of teen smoking and drinking. *Journal of Health Economics*, *18*(6), 769–793. https://doi.org/10.1016/S0167-6296(99)00018-1

Dehejia, R.H. & Wahba, S. (2002). Propensity score-matching methods for non-experimental causal studies. *Review of Economics and Statistics*, 84(1), 151–161. https://doi.org/10.3386/w6829

Edwards, G. (1997). Alcohol policy and the public good. *Addiction*, 92(3s1), 73–80. https://doi.org/10.1111/j.1360-0443.1997.tb03399.x

Falba, T., Teng, H. M., Sindelar, J. L. & Gallo, W. T. (2005). The effect of involuntary job loss on smoking intensity and relapse. *Addiction*, 100(9), 1330–1339. https://doi.org/10.1111/j.1360-0443.2005.01150.x

Falk, D. E., Hsiao-Ye, Y. I. & Hiller-Sturmhöfel, S. (2006). An epidemiologic analysis of co-occurring alcohol and tobacco use and disorders. *Alcohol Research*, 29(3), 162–171. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6527037/

Franks, P., Gold, M. R. & Fiscella, K. (2003). Sociodemographics, self-rated health, and mortality in the US. *Social Science & Medicine*, 56(12), 2505–2514. https://doi.org/10.1016/s0277-9536(02)00281-2

Gathergood, J. (2013). An instrumental variable approach to unemployment, psychological health and social norm effects. *Health Economics*, 22(6), 643–654. https://doi.org/10.1002/hec.2831

Gebel, M. & Voßemer, J. (2014). The impact of employment transitions on health in Germany. A difference-in-differences propensity score matching approach. *Social Science & Medicine*, 108, 128–136. https://doi.org/10.1016/j.socscimed.2014.02.039

Gervais, M., Jaimovich, N., Siu, H. E. & Yedid-Levi, Y. (2016). What should I be when I grow up? Occupations and unemployment over the life cycle. *Journal of Monetary Economics*, 83, 54–70. https://doi.org/10.1016/j.jmoneco.2016.08.003

Grant, M. D., Piotrowski, Z. H. & Chappell, R. (1995). Self-reported health and survival in the Longitudinal Study of Aging, 1984–1986. *Journal of Clinical Epidemiology*, 48(3), 375–387. https://doi.org/10.1016/0895-4356(94)00143-e

Halpern, M. T., Shikiar, R., Rentz, A. M. & Khan, Z. M. (2001). Impact of smoking status on workplace absenteeism and productivity. *Tobacco Control*, 10(3), 233–238. http://dx.doi.org/10.1136/tc.10.3.233

Heckman, J. J., Ichimura, H. & Todd, P. (1998). Matching as an econometric evaluation estimator. *The Review of Economic Studies*, 65(2), 261–294. https://doi.org/10.2307/2971733

Hill, C. (2003). L'augmentation du prix du tabac: une mesure de santé publique. *Bulletin épidémiologique hebdomadaire*, 22-23. http://beh.santepubliquefrance.fr/beh/2003/22_23/beh_22_23_2003.pdf

Hill, C. (2014). Impact de l'augmentation des prix sur la consommation de tabac. Paris: Institut Gustave Roussy. https://www.gustaveroussy.fr/sites/default/files/impact_prix_consommation_tabac_2014.pdf

Ichino, A., Mealli, F. & Nannicini, T. (2008). From temporary help jobs to permanent employment: what can we learn from matching estimators and their sensitivity? *Journal of Applied Econometrics*, 23(3), 305–327. https://doi.org/10.1002/jae.998

Idler, E. L. & Angel, R. J. (1990). Self-rated health and mortality in the NHANES-I Epidemiologic Follow-up Study. *American Journal of Public Health*, 80(4), 446–452. https://doi.org/10.2105/ajph.80.4.446

Idler, E. L. & Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health and Social Behavior*, 21–37. https://doi.org/10.2307/2955359

Idler, E. L. & Kasl, S. V. (1995). Self-ratings of health: do they also predict change in functional ability? *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 50(6), S344–S353. https://doi.org/10.1093/geronb/50b.6.s344

Imbens, G. W. & Wooldridge, J. M. (2009). Recent developments in the econometrics of program evaluation. *Journal of Economic Literature*, 47(1), 5–86. https://doi.org/10.3386/w14251

Jarvis, M. J. & Wardle, J. (1999). Social patterning of individual health behaviours: the case of cigarette smoking. *Social Determinants of Health*, 2, 224-37. https://doi.org/10.1093/acprof:oso/9780198565895.003.11

Johansson, E., Alho, H., Kiiskinen, U. & Poikolainen, K. (2007). The association of alcohol dependency with employment probability: evidence from the population survey 'Health 2000 in Finland'. *Health Economics*, 16(7), 739–754. https://doi.org/10.1002/hec.1201

Jusot, F., Khlat, M., Rochereau, T. & Serme, C. (2008). Job loss from poor health, smoking and obesity: a national prospective survey in France. *Journal of Epidemiology & Community Health*, 62(4), 332–337. https://doi.org/10.1136/jech.2007.060772

Kuhn, A., Lalive, R. & Zweimüller, J. (2009). The public health costs of job loss. *Journal of Health Economics*, 28(6), 1099–1115. https://doi.org/10.1016/j.jhealeco.2009.09.004

Lechner, M. (2002). Program heterogeneity and propensity score matching: An application to the evaluation of active labor market policies. *Review of Economics and Statistics*, 84(2), 205–220. https://doi.org/10.1162/003465302317411488

Lee, A. J., Crombie, I. K., Smith, W. C. & Tunstall-Pedoe, H. D. (1991). Cigarette smoking and employment status. *Social Science & Medicine*, 33(11), 1309–1312. https://doi.org/10.1016/0277-9536(91)90080-V

Linn, M. W., Sandifer, R. & Stein, S. (1985). Effects of unemployment on mental and physical health. *American Journal of Public Health*, 75(5), 502–506. https://doi.org/10.2105/ajph.75.5.502

Lundberg, O. & Manderbacka, K. (1996). Assessing reliability of a measure of self-rated health. *Scandinavian Journal of Social Medicine*, 24(3), 218–224. https://doi.org/10.1177/140349489602400314

Ma, J., Siegel, R. L., Jacobs, E. J. & Jemal, A. (2018). Smoking-attributable Mortality by State in 2014, US. *American Journal of Preventive Medicine*, 54(5), 661–670. https://doi.org/10.1016/j.amepre.2018.01.038

MacDonald, Z. & Shields, M. A. (2004). Does problem drinking affect employment? Evidence from England. *Health Economics*, 13(2), 139–155. https://doi.org/10.1002/hec.816

Madden, P. A. & Heath, A. C. (2002). Shared genetic vulnerability in alcohol and cigarette use and dependence. *Alcoholism: Clinical and Experimental Research*, 26(12), 1919–1921. https://doi.org/10.1111/j.1530-0277.2002.tb02503.x

Marcus J (2014). Does Job Loss Make You Smoke and Gain Weight? *Economica*, 81(324), 626–648. https://dx.doi.org/10.2139/ssrn.2020174

McCallum, J., Shadbolt, B. & Wang, D. (1994). Self-rated health and survival: a 7-year follow-up study of Australian elderly. *American Journal of Public Health*, 84(7), 1100–1105. https://doi.org/10.2105/ajph.84.7.1100

McGinnis, J. M. & Foege, W. H. (1993). Actual causes of death in the United States. *Jama*, 270(18), 2207–2212. https://doi.org/10.1001/jama.270.18.2207

Mello, N. K., Mendelson, J. H., & Palmieri, S. L. (1987). Cigarette smoking by women: interactions with alcohol use. *Psychopharmacology*, *93*(1), 8–15. https://doi.org/10.1007/bf02439579

Mintz, J., Boyd, G., Rose, J. E., Charuvastra, V. C. & Jarvik, M. E. (1985). Alcohol increases cigarette smoking: a laboratory demonstration. *Addictive Behaviors*, *10*(3), 203–207. https://doi.org/10.1016/0306-4603(85)90001-2

Miquel, L., Rehm, J., Shield, K. D., Vela, E., Bustins, M., Segura, L., Colom, J., Anderson, P. & Gual, A. (2018). Alcohol, tobacco and health care costs: a population-wide cohort study (n= 606 947 patients) of current drinkers based on medical and administrative health records from Catalonia. *European Journal of Public Health*, 28(4), 674–680. https://doi.org/10.1093/eurpub/ckx236

Mokdad, A. H., Marks, J. S., Stroup, D. F. & Gerberding, J. L. (2004). Actual causes of death in the United States, 2000. *Jama*, 291(10), 1238–1245. https://doi.org/10.1001/jama.291.10.1238

Montgomery, S. M., Cook, D. G., Bartley, M. J. & Wadsworth, M. E. (1998). Unemployment, cigarette smoking, alcohol consumption and body weight in young British men. *European Journal of Public Health*, 8(1), 21–27. http://dx.doi.org/10.1093/eurpub/8.1.21

Morris, J. K., Cook, D. G. & Shaper, A. G. (1992). Non-employment and changes in smoking, drinking, and body weight. *British Medical Journal*, 304(6826), 536–541. https://dx.doi.org/10.1136%2Fbmj.304.6826.536

Mullahy, J. & Sindelar, J. (1996). Employment, unemployment, and problem drinking. *Journal of Health Economics*, 15(4), 409–434. https://doi.org/10.3386/w5123

Nelson, D. E., Jarman, D. W., Rehm, J., Greenfield, T. K., Rey, G., Kerr, W. C., ... & Naimi, T. S. (2013). Alcohol-attributable cancer deaths and years of potential life lost in the United States. *American Journal of Public Health*, 103(4), 641–648. https://dx.doi.org/10.2105%2FAJPH.2012.301199

Norström, T. (2006). Per capita alcohol consumption and sickness absence. *Addiction*, 101(10), 1421–1427. https://doi.org/10.1111/j.1360-0443.2006.01446.x

Okun, M. A., Stock, W. A., Haring, M. J. & Witter, R. A. (1984). Health and subjective well-being: A meta-analyis. *The International Journal of Aging and Human Development*, 19(2), 111–132. https://doi.org/10.2190/QGJN-0N81-5957-HAQD

Osipow, S. H. & Fitzgerald, L. F. (1993). Unemployment and mental health: A neglected relationship. *Applied and Preventive Psychology*, 2(2), 59–63. https://doi.org/10.1016/S0962-1849(05)80112-X

Peck, D. F. & Plant, M. A. (1986). Unemployment and illegal drug use: concordant evidence from a prospective study and national trends. *British Medical Journal* (Clin Res Ed), 293(6552), 929–932. https://dx.doi.org/10.1136%2Fbmj.293.6552.929

Peretti-Watel, P., Constance, J., Seror, V. & Beck, F. (2009). Cigarettes and social differentiation in France: is tobacco use increasingly concentrated among the poor? *Addiction*, 104(10), 1718–1728. https://doi.org/10.1111/j.1360-0443.2009.02682.x

Peto, R., Boreham, J., Lopez, A. D., Thun, M. & Heath, C. (1992). Mortality from tobacco in developed countries: indirect estimation from national vital statistics. *The Lancet*, 339(8804), 1268–1278. https://doi.org/10.1016/0140-6736(92)91600-d

Pirracchio, R., Resche-Rigon, M. & Chevret, S. (2012). Evaluation of the propensity score methods for estimating marginal odds ratios in case of small sample size. *BMC Medical Research Methodology*, 12(1), 70. https://doi.org/10.1186/1471-2288-12-70

Praud, D., Rota, M., Rehm, J., Shield, K., Zatoński, W., Hashibe, M., ... & Boffetta, P. (2016). Cancer incidence and mortality attributable to alcohol consumption. *International Journal of Cancer*, 138(6), 1380–1387. https://doi.org/10.1002/ijc.29890

Rice, N., Carr-Hill, R., Dixon, P., & Sutton, M. (1998). The influence of households on drinking behaviour: a multilevel analysis. *Social Science & Medicine*, 46(8), 971–979. https://doi.org/10.1016/s0277-9536(97)10017-x

Ronchetti, J. & Terriau A. (2020). L'impact du chômage sur l'état de santé. *Revue Économique*, 71(5), 815-839. https://doi.org/10.3917/reco.715.0815

Ronchetti, J. & Terriau A. (2019). Impact of unemployment on self-perceived health: Evidence from French panel data. *The European Journal of Health Economics*, 20(6), 879–889. https://doi.org/10.1007/s10198-019-01050-5

Rosenbaum, P. R. & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70(1), 41–55. https://doi.org/10.1093/biomet/70.1.41

Rosenbaum, P. R. & Rubin, D. B. (1985). The bias due to incomplete matching. *ETS Research Report Series*, 1983 (2), 103–116. https://doi.org/10.1002/j.2330-8516.1983.tb00037.x

Rosenbaum, P.R. & Rubin, D.B. (1985). Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *The American Statistician*, 39(1), 33–38. https://doi.org/10.2307/2683903

Salm, M. (2009). Does job loss cause ill health? *Health Economics*, 18(9), 1075–1089. https://doi.org/10.1002/hec.1537

Schmitz, H. (2011). Why are the unemployed in worse health? The causal effect of unemployment on health. *Labour Economics*, 18(1), 71–78. https://doi.org/10.1016/j.labeco.2010.08.005

Shiffman, S. & Balabanis, M. (1995). Associations between alcohol and tobacco. *In: Alcohol and tobacco: From basic science to clinical practice*, pp. 17–36. Bethesda, MD: National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism.

Smith, J. A. & Todd, P. E. (2005). Does matching overcome LaLonde's critique of non-experimental estimators? *Journal of Econometrics*, 125(1-2), 305–353. https://doi.org/10.1016/j.jeconom.2004.04.011

Sturm, R. (2002). The effects of obesity, smoking, and drinking on medical problems and costs. *Health Affairs*, 21(2), 245–253. https://doi.org/10.1377/hlthaff.21.2.245

Tauchmann, H., Lenz, S., Requate, T. & Schmidt, C. M. (2013). Tobacco and alcohol: complements or substitutes? *Empirical Economics*, *45*(1), 539–566. https://doi.org/10.1007/s00181-012-0611-3

Tefft, N. (2011). Insights on unemployment, unemployment insurance, and mental health. *Journal of Health Economics*, 30(2), 258–264. https://doi.org/10.1016/j.jhealeco.2011.01.006

Thomas, C., Benzeval, M. & Stansfeld, S. A. (2005). Employment transitions and mental health: an analysis from the British household panel survey. *Journal of Epidemiology & Community Health*, 59(3), 243–249. https://dx.doi.org/10.1136%2Fjech.2004.019778

Xu, X., Bishop, E. E., Kennedy, S. M., Simpson, S. A. & Pechacek, T. F. (2015). Annual healthcare spending attributable to cigarette smoking: an update. *American Journal of Preventive Medicine*, 48(3), 326–333. https://doi.org/10.1016/j.amepre.2014.10.012

APPENDIX

Alcohol Consumption Profiles

	Weekly volume *in number of standard-sized drinks**		Consumption of 6 or more drinks on a single occasion	Consumer profile	Percentage of people concerned
Men	0 drinks	and	Never	Non-drinkers	15.9
Women	0 drinks				32.7
Men	≤ 21 drinks	and	Never	Moderate drinkers	38.4
Women	≤ 14 drinks				50.0
Men	≤ 21 drinks	and	≤ once a month	Occasional binge drinkers	33.2
Women	≤ 14 drinks				14.7
Men	≥ 22 drinks	or	≥ once a week	Chronic binge drinkers	12.5
Women	≥ 15 drinks				2.6

Illustration of standard-sized alcoholic drinks

Alcohol = any alcoholic drink (wine, beer, whisky, etc.)

Standard drink (10 grams of alcohol) =

2.5 cl of **aniseed flavoured spirit** | 2.5 cl of **whisky** | 7 cl **other aperitif** | 25 cl of **cider** or **beer** | 10 cl of **champagne** | 10 cl of **red/white wine** | 2.5 cl of a **liqueur**

Sources: Com-Ruelle & Célant (2013).

The Employment Prospects of Young Graduates in Italy during and after the 2008 Crisis

Raffaella Cascioli*

Abstract – The school-to-work-transition in Italy suffers a number of critical issues. This paper documents the employment prospects of young Italians graduates during the economic recession (2008-2014) and in the subsequent period of recovery (2015-2017). The analysis, based on data from the European Labour Force Survey, focuses on the employment rate of recent graduates in the 20-34 age group, an indicator adopted by Europe to monitor transitions from school to work. We distinguish temporary employment, and examine in parallel the employment rates of those beyond three years after graduation. Logit model estimations of the probability to be employed, accounting for educational attainment and time spent in the labour market, show that seniority did not provide significant protection during the crisis, and that tertiary graduates were less affected by the crisis than upper secondary graduates, and have benefited more from the recovery. An analysis of pseudo-cohorts' trajectories suggests no evidence of a scarring effect but, for upper secondary graduates only, the changes in temporary employment rates evoke cohort effects.

JEL Classification: I26, J13, J21, J22, J23, J24
Keywords: school-to-work transition, youth labour market, temporary jobs, Italy

*ISTAT (racascio@istat.it)
The author wishes to thank three anonymous reviewers whose comments and suggestions have helped improving this article.
Received in October 2018, accepted in July 2020.

Citation: R. Cascioli (2021). The Employment Prospects of Young Graduates in Italy during and after the 2008 Crisis. *Economie et Statistique / Economics and Statistics*, 522-523, 43–59. https://doi.org/10.24187/ecostat.2021.522d.2038

Historically, some European countries have been more successful than others in integrating young people into the labour market. Italy, with a remarkably long time to access a first job and one of the lowest youth employment rate in the European Union (EU), is an extreme example of the critical issues affecting the school-to-work transition in Southern Europe. Disparities in the school-to-work transition and employment prospects after graduation across countries depend on the education and training system (study programs and orientation, path flexibility, etc.), the degree of integration between educational paths and the labour market (internships, apprenticeships, etc.) and labour market institutions (employment protection legislation, flexibility, etc.). In all these dimensions, Italy has been showing wide differences compared to many other EU countries for a long time. Besides "structural" aspects of the school-to-work transition, youth employment is highly sensitive to economic trends, and was affected by the global economic crisis of 2008 – however with differences in magnitude and length across countries. The Italian economy was hit more than other OECD countries, and the recovery was somewhat slower and moderate (OECD, 2019a). In addition, a major (and much debated) reform of the labour market was initiated in 2014, with a number of legislative acts usually referred to collectively as the *Jobs Act*. The past decade in Italy was then characterized by a crisis, a modest recovery, and a labour market reform. How have the employment prospects of young Italians changed in this context? Can we sort out between age, period and generation effects? We address these questions by examining recent graduates' employment rates in Italy over a period of recession (2008-2014) and a period of recovery (2014-2017).

Young people's disadvantages when entering the labour market are well known, and can be summarized as follows: Firstly, and independently from the condition of the labor market, despite their education level on average higher than that of the population already employed, young graduates lack work experience, and suffer an "experience gap", as termed by e.g. Pastore (2015). Bell & Blanchflower (2015) note that this lack of work experience may generate an experience trap, when firms are in search for experienced workers, which prevents young people from gaining the work experience that firms require. Secondly, whether because they are more often working in temporary jobs or because they are the "last in", they are more likely to be the first out if the economy slows down. This is why young people's employment has been found the most vulnerable segment in the labour market in many European countries (Brada & Signorelli, 2012). Regarding the context of labour market entry, the contributions of school-to-work transition processes and labour market institutions to young people's integration in employment have been extensively analyzed (e.g., Ryan, 2001; Quintini *et al.*, 2007; Quintini & Manfredi, 2009; van der Velden & Wolbers, 2008; Barbieri *et al.*, 2018). Ryan (2001) examined in particular the impact of employment protection legislation in general *vs.* special programs aimed at young people. He concluded that deregulation could contribute to a less uneven distribution of unemployment, while specific programs could have the effect of replacing regular employment with insecure jobs, making all young workers worse off. Other aspects of labour market institutions have been much debated. One is the role of temporary employment, highlighted since the 1990s as a means to provide young people with the work experience they need and shorten the average duration of unemployment (OECD, 1994; Krugman, 1994). However, temporary contracts do not allow young people to accumulate specific human capital, and their effect on youth employment rate are different depending of the context, as shown from a comparison between Europe and the United-States (Quintini & Manfredi, 2009). More generally, several studies show that deregulating temporary employment does not reduce unemployment (Noelke, 2016), or that it does so but at the price of a deterioration in job quality (Goffette & Véro, 2015) or at the price of increased job instability (e.g. in Spain, cf. Ianelli & Soro-Bonmati, 2003). It is also debated whether temporary jobs are stepping-stones (Booth *et al.*, 2002; Scherer, 2004), with some works underlining the risk of entrapment in temporary jobs (Barbieri *et al.*, 2019). For some authors, a reduction in the protection afforded to permanent workers would contribute to reduce the inequality between insiders and outsiders (Gebel & Giesecke, 2016; Passaretta & Wolbers, 2016). Finally, another strand of literature has investigated more specifically the impact of recessions on youth labor market outcomes and the long-term effects of having entered the labor market in bad times, highlighting the risks of scarring effects and "lost

generations" (e.g. Scarpetta *et al.*, 2010; Gaini *et al.*, 2013).[1]

Youth employment prospects can be approached through various indicators: the unemployment rate, the employment rate, the NEET rate (share of youth not in education, employment or training), and youth to adults unemployment rate. In this paper, we focus on the employment rate of recent graduates who are not in education or training, one of eight benchmarks of the EU 2020 strategic framework for European cooperation in education and training (ET2020[2]), which set four strategies objectives, amongst which "Improving the quality and efficiency of education and training" (Council of the European Union, 2009). The indicator on recent graduates' employment rate was developed as a proxy for youth employability (for details, see Garrouste, 2011; Boeteng *et al.*, 2011; Arjona Perez *et al.*, 2010a; 2010b).

More precisely, the indicator, based on data from the European Labour Force Survey, measures the share of employed upper secondary and tertiary graduates (20-34 year-olds) amongst graduates who have left education or training 1 to 3 years before the reference year, and are not enrolled in any further education and training programmes. The target for 2020 was set at 82%[3] (Council of the European Union, 2012). The indicator has been used in particular to analyse the determinants of young graduates' employability in Europe (Garrouste & Rodrigues, 2012; 2014), and then for analyses to set the future employability benchmark of the European indicator under ET2025 (Suta *et al.*, 2018).[4]

The analysis of the indicator is of particular interest in the case of Italy, where the share of young people not in education, employment, or training (NEET) has been an increasing concern (ISTAT, 2018; 2010). This indicator will be used throughout the paper.

In complement, we will apply the same indicator to less recent graduates, i.e. who have graduated for over three years (in the same age group).[5] Therefore, the analysis takes into account several cohorts of graduates and the joint use of the indicator for recent and less recent graduates allows to observe the entire group of young people no longer in education and training. We also distinguish temporary employment, particularly given that during the observed period Italy introduced a labour market reform with a potentially significant effect on temporary employment (*infra*).

Using these indicators, we document the changes in young upper secondary and tertiary graduates' employment during the crisis and whether their seniority into the labour market protected or penalized them in the economic downturn. We examine the association between the temporary employment trend and the introduction of the Italian *Jobs Act* in 2014. Moreover, we investigate a generation effect and explore the possible existence of a scarring effect due to unfavourable economic conditions at the time of entry in the labour market through a pseudo-panel analysis.

The rest of the article begins with a brief overview of the Italian context regarding the school-to-work transition, the 2014 labour market reform, and the Italian-EU gap in youth employment rate over the period analysed. The second section examines the changes in young graduates' employment rates, and the third section examines the trajectories of generations of graduates from 2005 to 2017.

1. The Italian Case

The financial crisis of 2008 had a dramatic impact on the Italian economy, its main effects being a reduction in Gross Domestic Product (GDP), a loss of jobs, and a reduction in productive capacity. Over the observed period, Italian GDP dropped by 7.1% and the country's productive capacity fell by 25% (OECD, 2019b). Over the same period, the Italian unemployment rate nearly doubled, from 6.7% in 2008 to 12.7% in 2014. Regarding school-to-work transitions,

---

1. During the economic crisis, debates on the 'scarring effect' and concerns expressed in that respect prompted the Council of the European Union to issue a Recommendation, calling the Member States for the implementation of measures to boost the integration of young generations into the labour market, the so-called "Youth Guarantee" (cf. Council of the European Union, April 2013).

2. See https://ec.europa.eu/eurostat/web/education-and-training/eu-benchmarks

3. "By 2020, the share of employed graduates (20-34 year olds) having left education and training no more than three years before the reference year should be at least 82% (as compared to 76.5% in 2010)" (Council of the European Union, 2012). The indicator is one of the key figures presented in the annual publication of the European Commission on Education and Training Monitor (https://ec.europa.eu/education/policy/strategic-framework/et-monitor_en); it has also been periodically analyzed by the Italian National Institute of Statistic (ISTAT, 2019c; 2018; 2014; 2013).

4. Other European comparisons of the school-to-work transition have used longitudinal data from EU-SILC (Berloffa et al.*, 2015; Carcillo* et al.*, 2015). However, the use of EU-SILC data for labour market analysis of cohorts of graduates is limited by excessively small sample size. Other studies have used data from two ad hoc surveys carried out within the framework of the European Labour Force Survey, in the years 2000 and 2009 (Kogan & Muller 2003; Passaretta & Wolbers, 2016).*

5. In this age group (20-34 years), the percentage of graduates who completed their education more than three years before is much higher among upper secondary graduates than among tertiary graduates (85.0% compared with 59.9%). Another part consists of upper secondary and tertiary graduates not in education or training, who graduated 1-3 years before: 14.2% and 33.8% respectively. A remaining part graduated less than one year before: 0.9% and 6.3% respectively. In Italy, among young graduates, less than one in three were still in education or training in 2017: 30.6% of those with an upper secondary school diploma and 31.7% of those with a higher education degree.

comparative studies have, for a long time, singled out Italy within a Mediterranean cluster characterized by low youth employment and activity rates, significantly high unemployment rate and a slow process to access employment. Despite a major labour market reform in 2014 (the *Jobs Act*), the Italian young graduates employment rate remains the lowest of the EU28 (just after Greece), and lower than in 2008. This section briefly presents this context.

1.1. School-to-work Transition

Italy is a typical example of the critical issues affecting the school-to-work transition in Southern Europe, suffering from a remarkably long period of transition (Pastore, 2017), longer than the European average (EUROSTAT, 2012), and rising: from around 3.5 years in 2006, the mean duration of school-to-work transition reached around 5.5 years in 2017 (Pastore *et al.*, 2020). Compared to European non-Mediterranean countries, Italy is characterized by a historically low (albeit rising) proportion of tertiary graduates (-16 percentage points, cf. OECD, 2017), huge regional discrepancies, a major role of family structure to support young people (the 'famiglia lunga' model, cf. Cicchelli & Merico, 2007; see also Barbieri *et al.*, 2015 and Berfolla *et al.*, 2016), and a rigid education system weakly connected to the labour market. The system is struggling to provide young people with the work experience they need, to develop general and job-related competences, and delays the labor market entry for a large number of individuals who enroll at the university. On the other hand, the share of people with a tertiary degree in the 30-34 age group is around 25%, well below the EU-28 (around 40%). The education and training system leaves most of the experience of work to after graduation, an almost direct opposite of the so-called "dual" system which increases early employment rates (Muller & Gangl, 2003), and allows a better matching of education with labour market demand (Ryan, 2001 - who also notes that the effects are less clear on long-term employment outcomes).[6]

Furthermore, the school-to-work transition is affected by a labour market characterized by strong protection of permanent workers, based on national collective agreements, and weak protection of temporary employees (OECD, 2010). Since the early 90s, a number of flexible forms of employment and related salary packages was introduced, aimed to support both competitiveness of the Italian industry and entry of young people into the labour market (Pastore, 2017). Nevertheless, Italian youth labour market indicators did not improve significantly: compared to other European countries, youth employment and activity rates have remained low, and their unemployment rates have been significantly high (Iannelli & Soro-Bonmati, 2003). The percentage of young NEET, and the persistence in this status has been markedly high (Quintini *et al.*, 2007). Moreover, the recovery after the 2008 crisis, less marked in Italy than in other European countries, has also had a different impact on the school-to-work transition (ISTAT, 2019a; Cascioli, 2016).

1.2. The *Jobs Act*

Following other labour market reforms (the previous one being the "Fornero" reform of 2012, see Tiraboschi, 2012) the Italian government initiated in 2014 another major labor market reform, aimed to increase employment, help re-launching growth, and reduce the dualism of the labour market between workers employed on indefinite contracts and those employed in "atypical" contracts by encouraging employers' to offer permanent jobs.

The reform resulted in a number of legislative acts usually referred to collectively as the *Jobs Act*.[7] Decree Law no. 34 of 20 March 2014 (the *Poletti Decree*) was the first part of the *Jobs Act*. It reviewed the legislative framework governing temporary contracts and apprenticeships. It allowed an increase in the number of times an employment contract could be renewed, as well as the maximum overall duration of such contracts, and it reduced the number of circumstances required (*causalità*) to justify a temporary contract. This was followed by Italian Law no. 183/2014, passed in December 2014, which modified the legal framework for permanent employment protection and the use of atypical contracts. This law paved the way for eight legislative decrees, adopted up to September 2015, including: Legislative Decree no. 23 of 4 March 2015 repealing workers' reinstatement rights (Article 18 of the Statute of Workers), in cases of dismissal without just cause in companies with more than 15 employees, and introducing a new type of permanent employment contract (applying only to new hires) characterized by increasing dismissal costs based on workers' seniority; Legislative Decree no. 81 of 15 June 2015,

6. In 2015, a reform of the education and training system (Law 107-2015, known as "The Good School") revived the Alternanza scuola lavoro *(ASL) – a system allowing alternating between school and practical work experience.*
7. All the documentation is downloadable from the Italian Ministry of Labour website: http://www.jobsact.lavoro.gov.it/documentazione/Pagine/default.aspx.

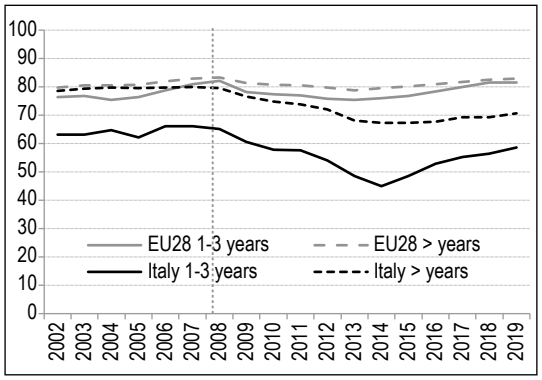
restricting the use of atypical contracts and eliminating some of them (such as the *contratto di collaborazione coordinata e continuativa a progetto*, a type of project-based – hence temporary – employment contract).

The government backed up these reforms by fiscal incentives to encourage employers to offer new permanent contracts, through temporary and dwindling national insurance contributions cuts: a three-year total exemption period for national insurance contributions (*Legge di Stabilità 2015,* i.e. an Italian budget law); this was changed by the *Legge di Stabilità 2016,* to a 40% exemption for a period of two years, and also limited to a territorially-defined program, the so-called Employment for the South, by the *Legge di Stabilità 2017*.

1.3. The Italian-European Gap in Young Graduates Employment Rates

The Italian-European gap in youth employment rate was already substantial prior to the economic crisis: in 2008, the employment rate of Italian recent graduates (having left education and training 1-3 years before) was around 65%, 17 points lower than the European average, slightly higher than in the early 2000s. With the downturn, the employment rate of recent Italian graduates dropped by 20 points in six years, almost doubling the gap (Figure I). The trend reversed after 2014, with the employment rate rising by about 10 points, yet without returning to its pre-crisis level. The gap is less pronounced for graduates with greater labour market seniority (those having graduated since more than three years).

Figure I – **Employment rates of graduates aged 20-34 having left education and training**

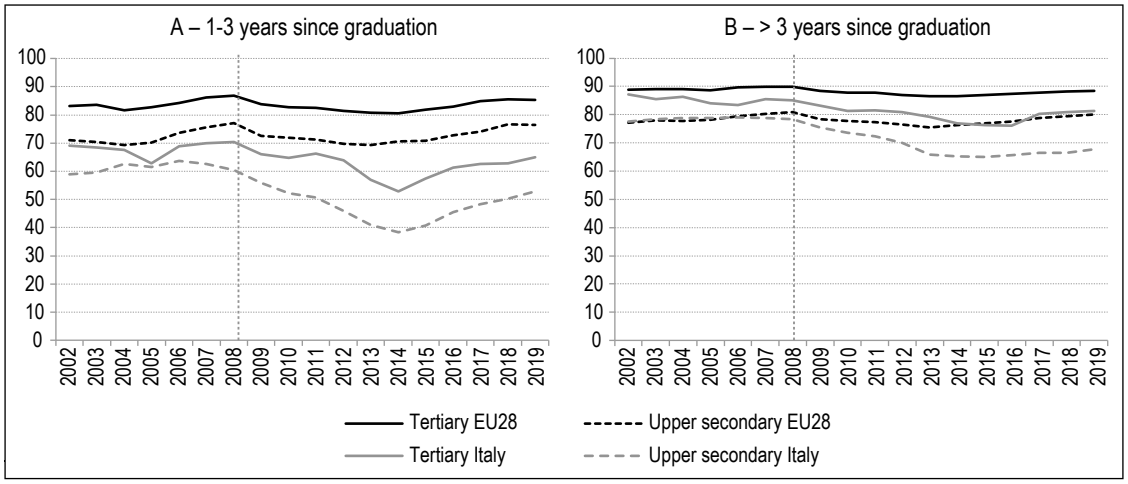


Sources: *European Labour Force Survey.*

This comparison also highlights that the school-to-work transition can be considered to be completed three years after leaving education in the EU on average, whereas it takes a much longer time in Italy. By education level, the decrease in the Italian youth employment rate is observed for both upper secondary and tertiary recent (1-3 years) graduates (Figure II-A). The crisis has also widened the gap in employment rates between upper secondary and tertiary graduates and this gap remains a long way off its pre-crisis level, while it remained substantially unchanged at EU level.

For less recent graduates, the initial Italian-European gaps in youth employment rates are much less pronounced, but again the economic crisis had a greater impact in Italy, with almost no recovery for upper secondary graduates (Figure II-B). All in all, the Italian-European youth employment gaps, between recent or less recent graduates as well as between upper secondary or tertiary graduates, already substantial in 2008, have become and remain wider than before the crisis.

Figure II – **Employment rates of graduates aged 20-34 having left education and training by educational attainment**



Sources: *European Labour Force Survey.*

2. Empirical Analysis of the Changes in Graduates Employment Prospects

In this section, we focus on the impact of the period of entry (economic crisis/recovery) on the employment prospects of graduates, according to the length of time since graduation (i.e. their seniority in the labour market, proxied by the time since graduation).

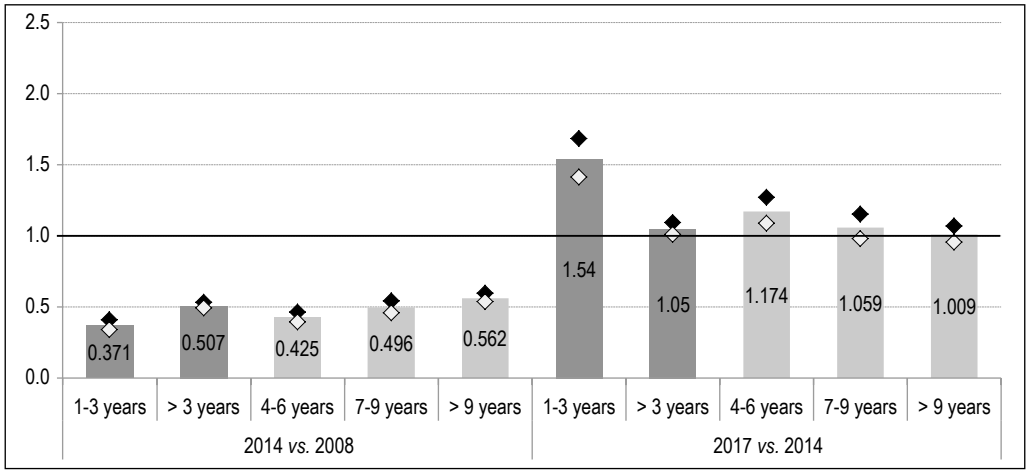
We use multivariate logistic models to estimate the conditional distribution of the probability of being employed for upper-secondary graduates and tertiary graduates. We control for gender, geographical area (North, Center and South) and citizenship (Italian, foreign); we also control for the type of diploma of upper-secondary graduates (general, technical, vocational, three-year vocational qualification) and for the main field of study of tertiary graduates' university degree (humanities, social sciences and law, technical-scientific). The models are estimated for subgroups of graduates broken down according to the number of years since graduation – i.e. of presence (or seniority) in the labour market (up to three years, over three years, the latter refined by spans of three years since graduation: 4-6 years, 7-9 years, and over 9 years). We consider the joint populations of graduates from years 2008 and 2014, and years 2014 and 2017, and estimate the odds ratios (thereafter OR) of employment and temporary employment in 2014 *vs.* 2008 (crisis), then in 2017 *vs.* 2014 (recovery).

Among recent upper secondary graduates, employment opportunities in 2014 were reduced to about one third (OR 0.371) of their level in 2008 (Figure III). Among their peers out of education for more than three years, employment prospects were "only" halved (OR 0.507). This clearly confirms that recent graduates are penalized the most by cyclical downturns. However, the impact of the crisis on employment prospects was only slightly lower for those who had been in the labour market the longest. This holds true for young people observed in 2014 who had left school 4-6 years before, and who had begun their transition from school to work during the economic crisis, as well as for those who in 2014 had left education more than six years before, and who have been exposed to the pre-crisis positive economic situation for a certain period of time (Figure III). This suggests that seniority in the labour market has not significantly protected young people from the negative impact of the economic crisis.[8]

The factors accounting for the higher "reactivity" of young people's probability of being employed include the high proportion of temporary contracts (allowing to reduce the number of employees simply by not retaining people at the end of these contracts). So the higher business-cycle sensitivity observed also among young Italian graduates with greater labour-market seniority would also be accounted for by the slower transition from temporary to permanent jobs that typifies employment in Italy.[9] [10]

8. In other countries, the sensitivity to the economy cycle decreases more quickly as labour market seniority increases; e.g. in France it becomes relatively weak from the fifth year of seniority onwards (Fondeur & Minni, 2004).
9. OECD, 2008.
10. In Italy the overall incidence of temporary jobs is higher than the one calculated on employees only; this is due to the widespread phenomenon of hidden self-employment among young people, that is, self-employed workers providing services to a single work provider in a continuous manner, hence acting as de facto employees (OECD, 2010). Moreover, the contracts often governing these employment relationships are generally of a rather limited duration.

Figure III – **Upper secondary graduates (aged 20-34). Change in the probability of being employed in 2014 *vs.* 2008, and in 2017 *vs.* 2014 (odds ratios, multivariate logistic models)**



Number of observations for each of the ten models (from left to right): 9,628; 61,964; 12,795; 13,433; 35,736; 8,830; 51,062; 11,543; 11,577; 27,942.
Notes: Black and white diamonds represent, respectively, the upper and lower 95% Wald Confidence Limits.
Sources: ISTAT, *Italian Labour Force Survey.*

The economic recovery had a considerable positive impact on the employment prospects of recent upper secondary graduates: compared to their peers in 2014, their employment prospects were higher by 50% (OR 1.54). Even those graduates who had been out of education 4-6 years before had a greater chance of being employed than their peers with the same level of seniority in 2014 (Figure IV). The former, despite the fact that entered the labour market close to 2014, which was the most critical moment for entry into the labour market (see also Figure VII below), have recovered thanks to the economic upturn, and their employment prospects 4-6 years after leaving education were greater than those of their peers who entered the labour market around 2011. On the other hand, in 2017, the employment prospects of those who had left education more than six years before were similar to those with the same seniority in 2014.[11] This result shows once again that the crisis had the greatest impact on young graduates with a shorter experience on the labour market; however, they were also the ones who benefited the most from the subsequent economic upturn. The dynamic during the recovery, strongly related to labour market seniority, is dissimilar to that during the crisis, where the changes were more even among upper secondary graduates, regardless of the length of time since graduation.

The results also show a sudden, substantial reduction in the employment prospects of tertiary graduates: from the beginning of the crisis up until 2014, the employment opportunities of recent graduates were more than halved (OR 0.436) while it was slightly less than halved among less recent graduates (OR 0.571).

In the latter three-year period examined above, those having benefitted the most of the period of recovery were the most recent tertiary graduates, with an increase in employment probability of 50%, which is similar to what has been estimated for upper secondary graduates. On the other hand, differently from upper secondary graduates, less recent graduates also had significantly better job prospects in 2017 than their peers in 2014; this holds true in particular for those who had left university 4-6 years before (OR 1.355) and 7-9 years before (OR 1.288).[12] Hence, the economic upturn affected tertiary graduates in a more homogeneous manner, regardless of their seniority in the labour market. In general, especially with regard to graduates with greater seniority, tertiary graduates appeared relatively more protected during the crisis, and more favoured during the economic upturn, than upper secondary graduates.

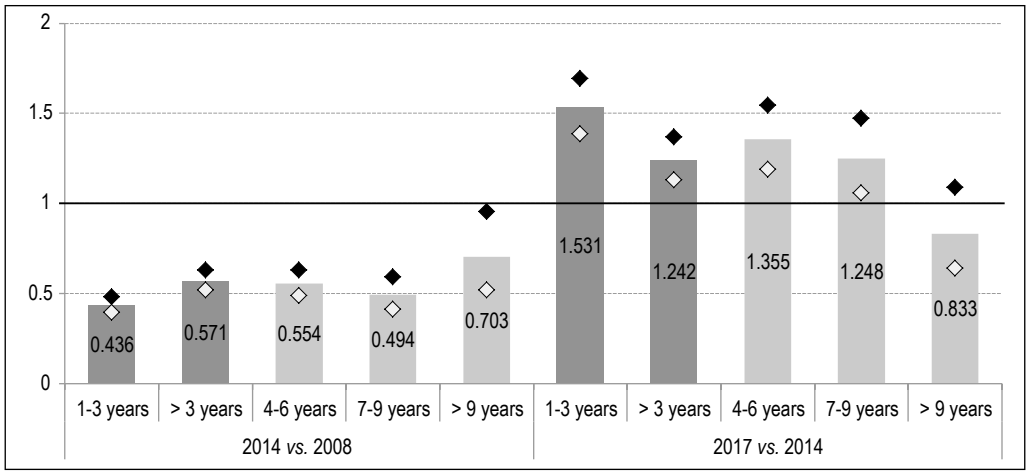
The younger generations are those most involved in temporary work (as fixed-term employees and project workers). In 2017, of those young people no longer in education and training, 28.5% of upper secondary graduates and 29.5% of tertiary graduates were working in temporary jobs. Moreover, although the incidence of temporary employment usually decreases over time, the proportion of young workers employed on such contracts remains remarkable even after several years have elapsed.[13]

11. However, there was also a favourable impact of the economic upturn for young people with higher labour market seniority. In fact, some of the graduates observed in 2017 who had finished their education over six years before, entered the labour market during the economic crisis – at a time of very low entry employment rates – while their peers observed in 2014 had benefited from the pre-crisis labour market with higher employment rates.

12. The results for tertiary graduates who graduated more than nine years previously, are not very reliable due to the limited number of such cases.

13. See above: Trajectories for generations of entrants into the labour market.

Figure IV – **Tertiary graduates (aged 20-34). Change in the probability of being employed in 2014 *vs.* 2008, and in 2017 *vs.* 2014 (odds ratios, multivariate logistic models)**



Number of observations for each of the ten models (from left to right): 7,705; 11,975; 6,142; 4,245; 1,588; 7,140; 11,607; 5,490; 4,256; 1,861.
Notes: see Figure III.
Sources: ISTAT, *Italian Labour Force Survey.*

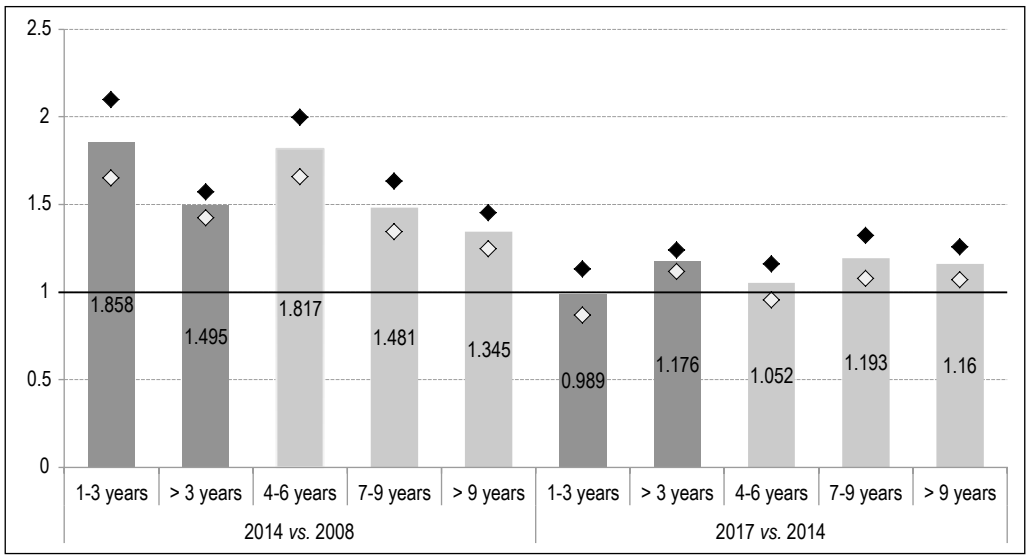
Comparing cohorts of young people with same labour market seniority during the crisis period and in the period of economic recovery provides an insight into how temporary employment evolves over time. Between 2008 and 2014, there was a sharp increase in the share of temporary employment among those upper secondary graduates who had finished their education 1-3 years before: the probability of finding a temporary job almost doubled during that period (OR 1.858) (Figure V). Lower, albeit important, was also the increase in temporary jobs, estimated around 50% among the young people who were out of studies for a longer time (OR 1.495). This seems to have particularly affected those who had graduated 4-6 years earlier. As already mentioned, those who, in 2014, had left school 4-6 years before entered the labour market during the crisis, at the same time as those who had graduated more recently.

The persistence of weak labour demand, together with the uncertainty that characterized the lengthy economic crisis has inevitably led to people being hired on temporary contracts; moreover, due also to the legislation governing the renewal and maximum duration of temporary contracts, young people who had been in the labour market for a shorter period were the ones most likely to end up in temporary jobs.

In the 2015-2017 period, the significant increase in the probability of being employmed among recent upper secondary graduates, and less recent graduates (having left school since 4-6 years) was not associated with an increase in temporary employment. This is a rather unexpected result: generally, temporary contracts are the quickest way to respond to increasing labour demand, thus adapting labour input to the cyclical movements of production, but also showing the persistence of a certain degree of insecurity about the enduring nature of the upturn – and, as mentioned earlier, the contraction of economic activity was only partially reversed between 2014 and 2017. Under these conditions, companies' strategies are usually very cautious and designed to implement easy-to-terminate short-term contracts while observing whether there is a true turnaround rather than a purely temporary improvement (Dell'Aringa *et al.,* 2018). Moreover, the first law of the *Jobs Act* (Decree Law no. 34 of 20 March 2014) aimed to encourage temporary hiring by simplifying the applicable rules. However, other parts of the *Jobs Act* introducing flexible termination of permanent contracts and incentives to employers to offer permanent employment – in the form of reduced employers' social contributions[14] – prevailed.

14. A recent paper, interpreting data published by the National Social Security Institution (INPS), identifies the Jobs Act and the related fiscal incentives as of the reasons for the substantial increase in the number of new permanent contracts, partly resulting from the transformation of previous temporary contracts, and partly the outcome of firms deciding to hire new employees in advance in order to qualify for the incentives (Leonardi & Nannicini, 2016). Another study, available on the INPS website, estimates the specific positive effect of the new type of permanent contract with increasing dismissal costs in proportion to seniority, introduced by the Jobs Act, pointing out that the expected increase in hiring was higher than the increase in layoffs (Boeri & Garibaldi, 2018). A recent study would seem to indicate that the increase in permanent contracts has been more the effect of the reduction in contributions than of the flexibility introduced by the "Jobs Act" (reducing firing costs and rendering them less uncertain) (Sestito, 2016).

Figure V – **Upper secondary graduates (aged 20-34) and employed. Change in the probability of being employed in a temporary job in 2014 *vs.* 2008, and in 2017 *vs.* 2014 (odds ratios, multivariate logistic models)**



Number of observations for each of the ten models (from left to right):.4,854; 44,364; 8,232; 9,407; 26,725; 3,896; 33,216; 6,632; 7,274; 19,310.
Notes: see Figure III.
Sources: ISTAT, *Italian Labour Force Survey.*

This analysis still seems consistent with recent reports finding that the reforms aimed at encouraging the use of permanent contracts have had a significant impact on both contract transformation and new hiring (Sestito & Viviano, 2016; Leonardi & Nannicini, 2016); yet, they had a greater impact on the hiring of young people on permanent contracts in their first job, than on the transformation of existing temporary contracts into permanent contracts (INPS, 2016).

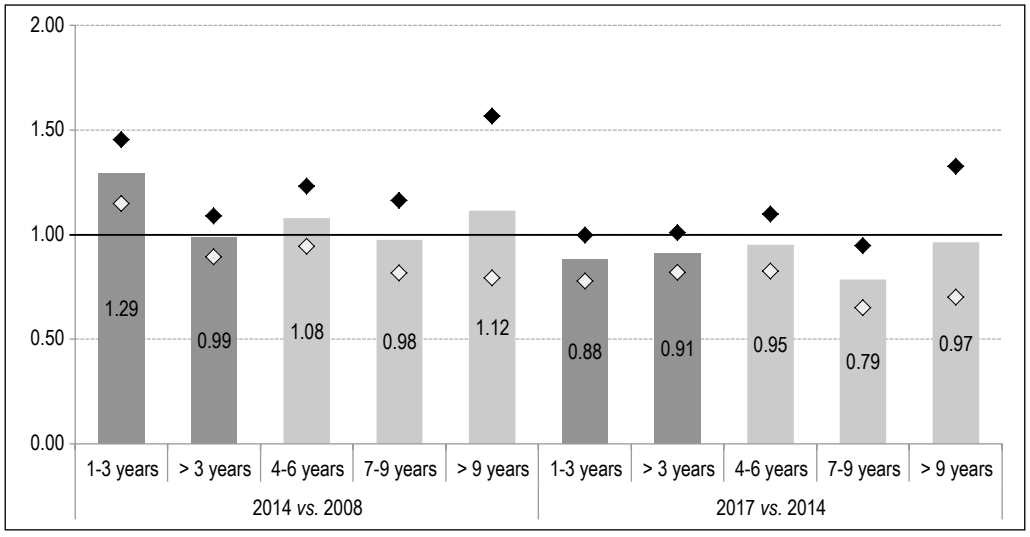
One exception is the case of the less recent upper secondary graduates (out of education for over six years): in 2017 their employment prospects were similar as those of their peers in 2014, but with a greater share of temporary jobs. The *Jobs Act* and cuts in employers' contributions then do not seem to have fostered the provision of permanent contracts to these young people. Given that tertiary graduates have not been penalized in the same manner (in terms of both the quantity and quality of employment), the peculiar dynamic of upper secondary graduates may be seen as a consequence and sign of the rapid obsolescence (and consequent lack of appeal) of upper secondary qualifications. This result further suggests the existence of an entrapment effect in "bad" jobs in a secondary market: in a segmented labour market the flow between the two sectors is more limited for upper secondary graduates.

Among tertiary graduates, temporary employment increased to a lesser degree during the crisis, in general affecting only the most recently entered in the labour market (OR 1.292) (Figure VI). In the years from 2014 to 2017, both those recent tertiary graduates, and those having graduated for a longer time (for whom there was a significant increase in employment prospects as mentioned above) saw a slight reduction in the risk of temporary employment. The *Jobs Act*, together with the cuts in employers' contributions in the period 2005-2016 aimed to foster permanent employment, have certainly played a part in this outcome. The impact of education on job prospects is also clear however: tertiary graduates were better protected during the crisis and were favoured to a greater extent by the economic upturn. Labour demand, also supported by recent changes in the production system, would seem to indicate that employers have become more interested in hiring young tertiary graduates, and in offering them permanent contracts more frequently.

This can be explained by a growing polarization of the Italian labour market, as in several other countries, driven by technological progress and globalization, and unfavourable to medium-skilled jobs.[15] However, polarization in Italy is different from that in other countries, since the highly qualified segment of employment is growing at a slower rate (OECD, 2019c). Given the expansive dynamic of tertiary education in Italy in recent decades (ISTAT, 2018), it is possible that we are observing the result of the unavoidable competition between graduates with different levels of educational achievement. In particular, given the limited demand

15. The share of medium-skilled jobs has significantly decreased compared to high-and low-skilled occupations (OECD, 2019c).

Figure VI – **Tertiary graduates (aged 20-34) and employed. Change in the probability of being employed in a temporary job in 2014 *vs.* 2008, and in 2017 *vs.* 2014 (odds ratios, multivariate logistic models)**



Number of observations for each of the ten models (from left to right): 4,654; 9,538; 4,738; 3,469; 1,331; 4,015; 8,903; 4,035; 3,365; 1,503.
Notes: see Figure III.
Sources: ISTAT, *Italian Labour Force Survey.*

of highly qualified occupation, jobs done by upper secondary graduates could be taken by people with higher educational qualifications, resulting in the crowding-out of the least qualified, and their transition towards unemployment, unstable employment or less qualified jobs.[16] In turn, this may result in an issue of downgrading occupation: while the better educated seem to access more easily permanent jobs, these jobs could be inadequate to their level of education (see ISTAT, 2019b).

Finally, the trend in temporary contracts displays a clear discontinuity over the latter three years: after the strong decline in the share of temporary jobs among upper secondary and tertiary recent graduates in the 2015-2016 period (-4.6 and -7.7 points, respectively), that share increases in 2017 (+4.7 and +4.2, respectively).[17] A similar, albeit less pronounced, trend was also observed among less recent graduates. It is difficult not to link this trend with the termination of the de-contribution scheme for permanent employment contracts; expectations of new benefits for the permanent employment of young people in the 2018 budget law also played a role.[18] This would suggest that the recent review of the legislative framework governing temporary employment has not at all reduced recourse to temporary contracts, since the termination of incentives to companies offering permanent employment contracts or transforming existing temporary contracts into permanent ones, has led to an increase in recourse to temporary contracts once again.

3. Trajectories of Generations of Entrants into the Labour Market

We now turn to an analysis of the trajectories of graduates through the employment rate of pseudo-cohorts over time: the "2008" cohort, aged 20-34 and in its 1st to 3rd year after graduation in 2008, aged 21-35 and in its 2nd to 4th year after graduation in 2009, etc., and we repeat the construction for previous and subsequent cohorts (with, of course, a shorter window of observation for the latter). Their trajectory, in terms of employment rate, is represented using a Lexis diagram, which allows highlighting period and generation or cohort effects, that is, the effect of experiencing the same events at the same time since leaving school.[19] As previously, we distinguish between upper secondary and tertiary graduates, and we also examine the rate of temporary employment.

Figure VII-A represents the employment rates for each cohort of recent upper secondary graduates during the period 2005-2017, and their evolution in the following years. The curves show a high degree of variability in the employment rate upon entry into the labour market, and a high level of sensitivity to the economic cycle during this phase. The curves show a more or less rapid increase in employment rates, depending on the economic conditions that each cohort experiences at the point of entry, and in the following years. In particular, the figure shows that from 2008 to 2014 – a period of unfavorable economic circumstances – the employment rates of the upper secondary graduates cohorts progressively decreased (from 60% to 38%), the curves showing a very slow increase, or in some cases even a fall. Even several years later – also as a result of the length of the economic crisis – a difference in the curve's levels between cohorts entering the labour market before the crisis and those entering during the crisis, remains. However, in more recent years, characterized by an economic upturn, the employment rates increased rapidly also for the older cohorts. Therefore, besides a clear period effect, there are also signs of a cohort effect, albeit only for reduced seniority. The worst labour market conditions at the time of entry and/or in the years immediately thereafter, do not seem to have penalized the employment path of young graduates in the long-term, hence the possibility of a scarring effect due to adverse economic conditions at entry is not corroborated by the analysed data.

The picture is slightly different for tertiary graduates (Figure VII-B). For the cohorts entering the labour market during the economic crisis, the curves only get closer to the ones of those who were already out of education before the crisis struck (i.e. around 7-9 years after graduation). In the latter years, the employment rate curves per generation tend to converge more, which would suggest that the economic upturn has helped to further reduce the original disadvantage of those entering the labour market during

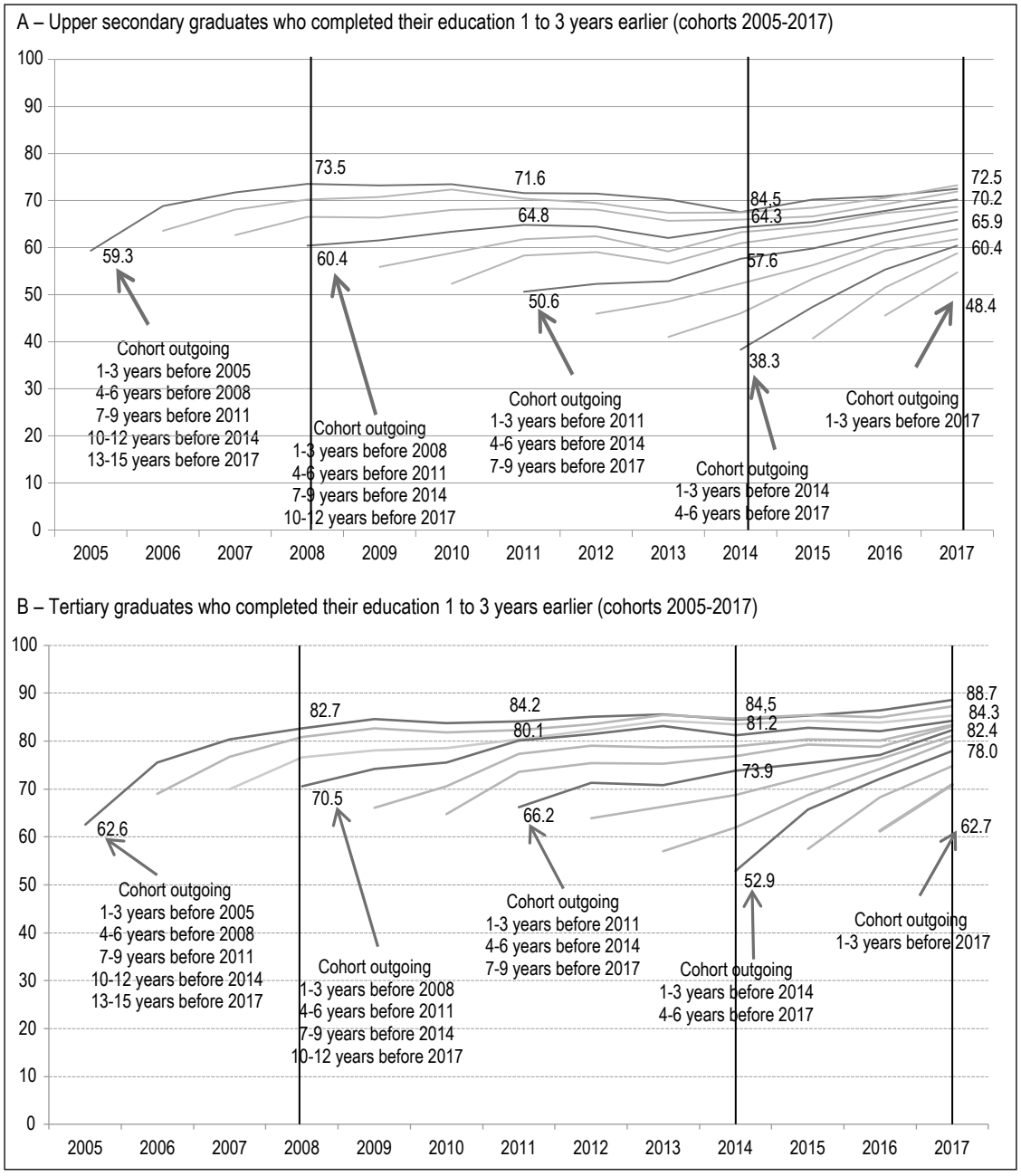
16. See Iannelli & Soro-Bonmati, 2003. The article compares the Italian and Spanish school-to-work transition approximately two decades ago. The authors attribute the greater disadvantage of Spain's low-educated young people compared to those of Italy to the faster expansion of tertiary education in Spain during that period.

17. In 2017, the positive trend of the employement rate of recent graduates saw a slight slowdown after two years of strong growth (cf. Figure II).

18. Recent total employment figures (ISTAT, 2019) also seem to confirm this trend, with a sharp decrease in permanent contracts in 2017 and a corresponding growth in the numbers of people hired on temporary contracts.

19. This approach, based on the construction of pseudo-panels, was used for example by Fondeur & Minni (2004) and Jugnot & Minni (2018). Fondeur & Minni, analysing youth employment in France over a long period (1975-2001), found that the economic cycle affects young people's integration in the labour market as a period effect, but does not engender a generation effect.

Figure VII – **Employment rates of cohorts**

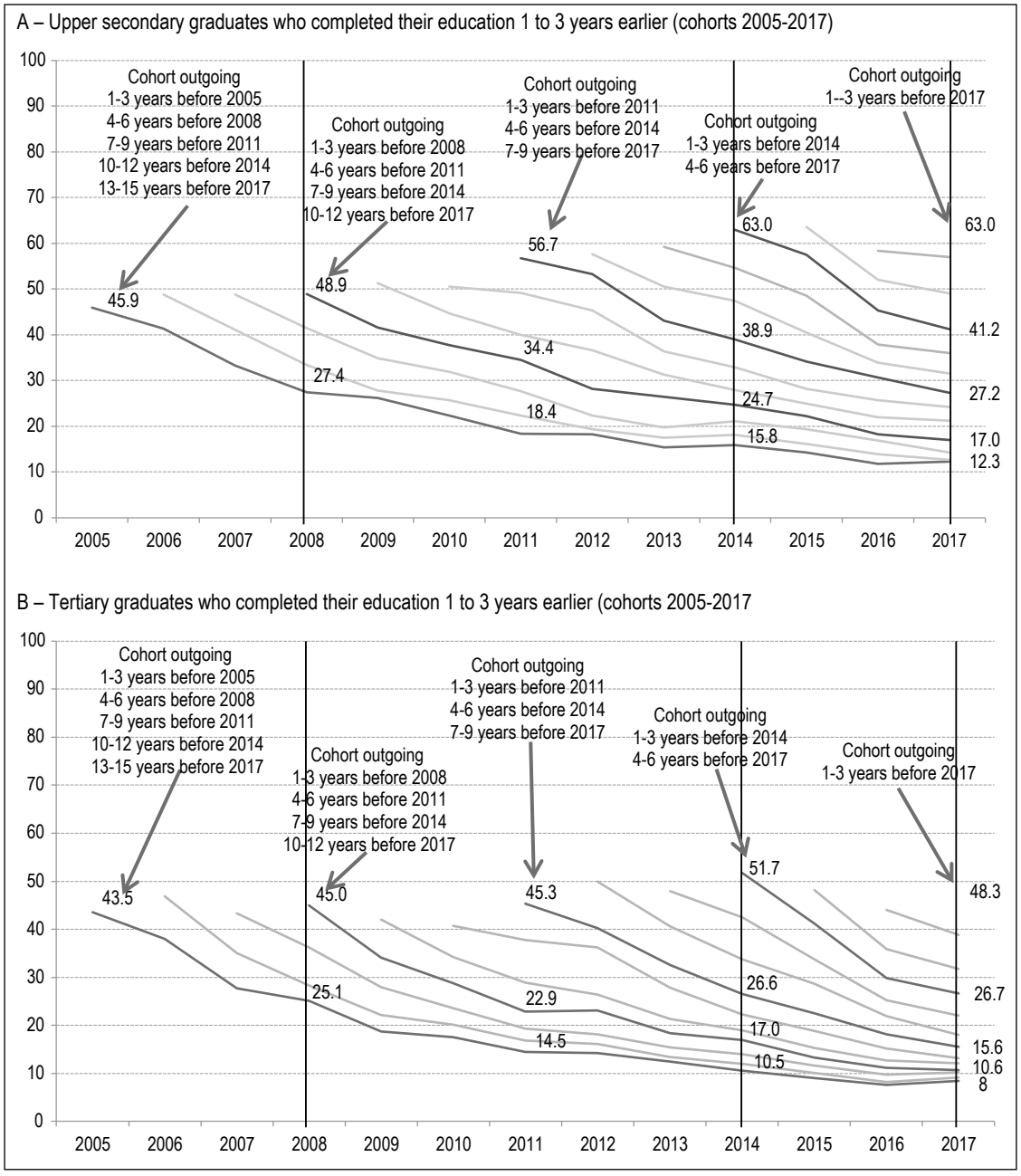


Sources: ISTAT, *Italian Labour Force Survey.*

the crisis. In summary, only a period effect is evident, there being no evidence of any cohort effect or scarring effect. These results are similar to those of Junot & Minni (2018), who analyse the same economic period in France. However, some differences remain: when the economic situation improves, the trajectories of the French generations converge, whereas the Italian ones only get closer; this suggests that, in Italy, sensitivity to the economy downturn decreases less quickly with increasing labour market seniority.

As regards upper secondary graduates, the share of new entrants (1-3 years after having left the school) employed in temporary jobs has increased over the years, with the only reduction being that seen in 2016 (Figure VIII). The slope of the curves differs from one cohort to the next due to the high sensitivity of temporary employment to the economic cycle; however, there is also an evident structural slowdown in the curves per generation. In fact, unlike what was observed for the employment rate, differences between generations persist throughout the period of observation: the curves do not overlap, and each successive generation has a smaller share of stable work than the previous one. It seems that an effect independent of the economic cycle exists, with new cohorts persisting in temporary employment to a greater extent than previous

Figure VIII – **Share of employed in temporary work**



Sources: ISTAT, *Italian Labour Force Survey.*

cohorts over time.[20] Therefore, we cannot refer to a scarring effect, in the sense that rather than long lasting traces left on professional trajectories by an economic downturn, this seems to reflect structural changes in the labour market; this would rather evoke a cohort effect, and an "entrapment effect" (Barbieri & Scherer, 2009, and Barbieri *et al.*, 2019).

Unlike upper secondary graduates, tertiary graduates' curves by cohort show a much less evident period effect and no clear cohort effect: for example, 7-9 years after leaving school, respectively in 2011, 2014 and 2017, the share of young people of the 2005, 2008 and 2011 cohorts in temporary jobs remains rather similar: 15%, 17.0% and 16%, respectively (Figure VIII-B).

Overall, a period effect is obvious for employment for all, but more marked for upper secondary graduates, together with a temporal effect, for this category only, linked to structural changes in the labour market, in particular due to the changes in employment standards introduced over the years. These effects seem to be associated with cohort effects for upper secondary graduates only,

20. Fondeur & Minni (2004) find that in France too, changes in employment standards have worsened the employment conditions of young people and increased the persistence of temporary employment.

with the persistence of low employment rates and new cohorts remaining longer in temporary employment.

* *
*

Youth employment rate is highly sensitive to the economic situation. Young people are overrepresented among those hired and laid off. The two main reasons for this are the large number of new graduates looking for their first job every year, and the large share of temporary employment at the entry.

In this paper, we examine how the employment prospects of young Italians have changed in a context of crisis, recovery and reform of the labour market. Three types of effects contribute to their employment (and temporary employment) probabilities: age effects (linked to seniority in the labor market), period effects (linked to the economic crisis and the subsequent, even if weak, recovery) and cohort effects (linked to the year of labour market entry). In the absence of panel data, these effects are very difficult to disentangle, so we focuses on one dimension at the time. The first part of the analysis (odds-ratio analysis) gives an insight on variations linked to seniority effects, and the second part focuses on cohort effects, more precisely the combined effect of age and period effects on a trajectory.

Our analysis first confirms the sensitivity of young Italian graduates' employment rates to economic downturns, those having graduated the most recently the most penalized. However, less recent graduates were not spared from the effects of the crisis.

The upturn in the employment prospects of recent graduates after 2014 confirms also that youth labour market is more reactive to the economic cycles. Indeed, the increase in the employment rate was less pronounced among those who had left education more than three years before, in particular for upper secondary graduates. However, the dynamic during the recovery, which strongly depends on the labour market seniority, is dissimilar to that of the crisis, which had been more evenly distributed among graduates, regardless of their seniority on the labour market. Nevertheless, the economic upturn after 2014 was not accompanied by an increase in temporary employment (with the only exception of upper secondary graduates who had graduated more than six years earlier), and there was even a slight reduction in the share of temporary jobs among tertiary graduates in this same period. This result is quite unexpected insofar as, generally speaking, even at the beginning of an economic upturn, an increase in temporary employment is the first sign of response, when there is still a certain degree of uncertainty regarding the strength of the recovery. Moreover, the first law of the *Jobs Act* scheme (Decree Law no. 34 of 2014), which made the use of temporary contracts easier for employers should have encouraged temporary hiring.[21] Therefore, other parts of the *Jobs Act*, which introduced flexibility in the termination of permanent contracts, together with concurrent fiscal incentives to permanent contracts (introduced in 2015 and 2016) without doubt positively affected these trends.[22] The analysis also confirms the difference between education levels, with tertiary graduates less affected than upper secondary graduates in general, and recovering in a more homogeneous manner, regardless of their seniority in the labour market. As for cohort analysis, it highlights a clear period effect, no scarring effect and, for upper secondary graduates only, the changes in temporary employment evoke cohort effects (each next generation of graduates with a smaller share of stable employment) and an entrapment effect (more recent cohorts staying longer in temporary employment).

These results open further points of discussion. Firstly, that persistent critical issues plague young Italians' transition from school to work urgently need addressing, by reducing barriers to the labour supply, increasing the quality of education and investing in educational sectors offering greater returns in terms of the employability, strengthening the synergy between the educational system and the labour market, including public spending in education.[23] Secondly, that labour market policies can influence employment and job quality trends, but that temporary incentives are in fact rather ineffective if they remain unsupported by structural measures to stimulate the demand for qualified labour.[24]

---

21. Although Legislative Decree no.81 of 15 June 2015 has restricted the use of certain temporary contracts, overall the reform seems to have facilitated the use of temporary contracts (see Ludovico, 2017).

22. Indeed, in 2017, with the loss of the de-contribution scheme for permanent contracts, and the expectation of new benefits for permanent hiring to be introduced by the 2018 Italian budget law, the temporary employment rate rose once again.

23. Italy spends about 3.6% of its Gross Domestic Product on education, from primary school to university: this is lower than the OECD average (5%) (OECD, 2019d).

24. The structural weakness of labour demand in Italy prior to the crisis, is accounted for by the weakness of the productive system (small sized companies and lack of innovative capacity), and by the limited development of public services (education, health, social services) which usually require a large share of qualified workers (see Reyneri, 2017).

The health crisis linked to the COVID-19 that we are experiencing will undoubtedly revive the analysis of youth employment. For the OECD (2020), "Young people are confronted with a tough job market that could compromise their futures". It is likely that the impact of the pandemic on youth employment will be different from that of the 2008 crisis, if only in terms of magnitude. Especially, the COVID-19 crisis could also affect more generally the length of school-to-work transition because of reduced employment opportunities, while the lockdowns may have exacerbated inequalities between tertiary and upper secondary graduates. It will then be particularly interesting to compare the impacts of the two crises, and the subsequent impact of policy responses – and perhaps answer the doubts expressed by Suta *et al.* (2019, p. 30) in a discussion on the ET strategy for 2025: "[…] should another downturn arrive, it is not clear whether recent graduates are now better equipped to achieve a better outcome than in the previous crisis." □

BIBLIOGRAPHY

Arjona Perez, E., Garrouste, C. & Kozovska, K. (2010a). Towards a Benchmark on the Contribution of Education and Training to Employability: a discussion note. EUR24147 EN. Luxemburg: Publications Office of the European Union.
https://op.europa.eu/en/publication-detail/-/publication/e448a780-7f71-48fe-bcd4-7acc8ef2289d/language-en

Arjona Perez, E., Garrouste, C. & Kozovska, K. (2010b). Towards a benchmark on the contribution of Education and Training to Employability: In-depth analysis of key issues. EUR 24624 EN. Luxemburg: Publications Office of the European Union.
https://op.europa.eu/en/publication-detail/-/publication/0d85ae5c-9f41-4b92-b3bc-711f7b208586/language-en

Barbieri, P. & Scherer, S. (2009). Labour Market Flexibilization and its Consequences in Italy. *European Sociological Review,* 25, 677–692. https://doi.org/10.1093/esr/jcp009

Barbieri, P., Cutuli, G. & Passaretta, G. (2018). Institutions and the school-to-work transition: disentangling the role of the macro-institutional context. *Socio-Economic Review*, 16(1), 161–183.
https://doi.org/10.1093/ser/mww019

Barbieri, P., Cutuli, G., Luijkx, R., Mari, G. & Scherer, S. (2019). Substitution, entrapment, and inefficiency? Cohort inequalities in a two-tier labour market. *Socio-Economic Review*, 17(2), 409–431 (preprint 2016).
https://doi.org/10.1093/ser/mww035

Bell, D.N.F. & Blanchflower, D.G. (2015). Youth Unemployment in Greece: Measuring the Challenge. *IZA Journal of European Labor Studies*. https://doi.org/10.1186/2193-9012-4-1

Berloffa, G., Matteazzi, E., Mazzolini, G., Sandor, A. & Villa, P. (2015). Youth School-To-Work Transitions: from entry jobs to career employment. STYLE *Working Papers* WP10.2. CROME, University of Brighton. http://www.style-research.eu/publications/working-papers/

Boateng, S.K., Garrouste, C. & Jouhette, S. (2011). Measuring Transition from School to Work in the EU: Role of the data source. International Conference *Catch the Train: Skills, Education and Jobs*, Brussels, June 20-21.
https://www.semanticscholar.org/paper/Measuring-Transition-from-School-to-Work-in-the-EU/7d1aef55124ae49f89ea24a76ee319cac4a1fe6b

Boeri, T. & Garibaldi, P. (2018). Graded Security and Labor Market Mobility. Clean Evidence from the Italian Jobs Act. INPS *Working Paper* N°10.
https://www.sipotra.it/wp-content/uploads/2018/05/Graded-Security-and-Labor-Market-Mobility-Clean-Evidence-from-the-Italian-Jobs-Act.pdf

Booth, A., Francesconi, M. & Frank, J. (2002). Temporary jobs: Stepping stones or dead ends? *The Economic Journal*, 112, 189–213. https://www.jstor.org/stable/798372

Brada, J. C., & Signorelli, M. (2012). Comparing Labor Market Performance: Some Stylized Facts and Key Findings. *Comparative Economic Studies*, 54, 231-250. https://doi.org/10.1057/ces.2012.20

Carcillo, S., Fernandez, R., Königs, S. & Minea, A. (2015). NEET Youth in the Aftermath of the Crisis: Challenges and Policies. OECD *Social, Employment and Migration Working Papers* N° 164.
http://dx.doi.org/10.1787/5js6363503f6-en

Cascioli, R. (2016). Le prospettive occupazionali dei giovani al termine dei percorsi di istruzione e formazione in Italia e in Europa alla luce dell'indicatore europeo sulla transizione scuola-lavoro. *Politiche Sociali* N°2/2016, pp. 287–310. https://doi.org/10.7389/84005

Cicchelli, V. & Merico, M. (2007). Le passage tardif à l'âge adulte des Italiens : entre maintien du modèle traditionnel et individualisation des trajectoires biographiques. *Horizons stratégiques*, 2(4), 70–87. https://www.cairn.info/revue-horizons-strategiques-2007-2-page-70.htm

Council of the European Union, (2013). Council recommendation of 22 April 2013 on establishing a Youth Guarantee. *Official journal of the European Union,* C120/01. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013H0426(01)&from=EN

Council of the European Union, (2012). Council conclusions of 11 May 2012 on the employability of graduates from education and training. *Official journal of the European Union,* C169/04. http://csdle.lex.unict.it/Archive/LW/EU%20social%20law/EU%20political%20addresses/Council%20of%20the%20EU%20conclusions/20120622-120952_2012_169_04enpdf.pdf

Council of the European Union, (2009). Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training (ET 2020), C 119/02. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52009XG0528(01)&from=EN

Dell'Aringa C., De Novellis, F., Barbini, M. & Comegna, V. (2018). L'esplosione dei lavori temporanei: fattori ciclici o strutturali? Monografia AREL. https://www.arel.it/ricerche/monografie/lesplosione-dei-lavori-temporanei-fattori-ciclici-o-strutturali

European Commission (2017). Education and Training Monitor. Luxemburg: Publications Office of the European Union. https://ec.europa.eu/education/content/summary_it

EUROFOUND (2012). NEET's – Young people not in employment, education or training: Characteristics, costs, and policy responses in Europe. Luxemburg: Publications Office of the European Union. https://www.eurofound.europa.eu/fr/publications/report/2012/labour-market-social-policies/neets-young-people-not-in-employment-education-or-training-characteristics-costs-and-policy

EUROSTAT (2012). School-to-work transition statistics. *Statistics explained.* https://ec.europa.eu/eurostat/statistics-explained/index.php/Archive:School-to-work_transition_statistics

Fondeur, Y. & Minni, C. (2004). L'emploi des jeunes au cœur des dynamiques du marché du travail. *Economie et Statistique*, 378-379, 85–104. https://www.insee.fr/fr/statistiques/fichier/1376673/es378-379e.pdf

Gaini, M., Leduc, A. & Vicard, A., (2013). Peut-on parler de « générations sacrifiées » ? Entrer sur le marché du travail dans une période de mauvaise conjoncture économique. *Economie et Statistique*, 461-463, 5–23. https://www.insee.fr/fr/statistiques/fichier/1377802/ES462A.pdf

Garrouste, C. (2011). Towards a benchmark on the contribution of Education and Training to Employability: Methodological Note. EUR 24616 EN. Luxemburg: Publications Office of the European Union. http://mpra.ub.uni-muenchen.de/37153/

Garrouste, C. & Rodrigues, M. (2014). Employability of young graduates in Europe. *International Journal of Manpower*, 35(4), 425–447. https://doi.org/10.1108/IJM-05-2013-0106

Garrouste, C. & Rodrigues, M. (2012). The employability of young graduates in Europe: Analysis of the ET2020 benchmark. Laboratoire d'Economie d'Orleans (LEO), European Commission Joint Research Center. http://mpra.ub.uni-muenchen.de/49919/

Gebel, M. & Giesecke, J. (2016). Does Deregulation Help? The Impact of Employment Protection Reforms on Youths' Unemployment and Temporary Employment Risks in Europe. *European Sociological Review*, 32(4), 486–500. https://doi.org/10.1093/esr/jcw022

Goffette C. & Vero J. (2015). Youth unemployment and job quality in times of crisis: a European overview. *Training and Employment*, 115, 1–4. https://www.cereq.fr/en/youth-unemployment-and-job-quality-times-crisis-european-overview

Iannelli C. & Soro-Bonmati, A. (2003). Transition Pathways in Italy and Spain: Different Patterns, Similar Vulnerability? *In:* W. Muller and M. Gangl (eds). *Transitions from Education to Work in Europe: The Integration of Youth into EU Labour Markets*, Ch. 8, pp. 212–250. Oxford University Press.

INPS (2017). Le imprese e i lavoratori beneficiari della decontribuzione. XV Rapporto annuale. https://www.inps.it/nuovoportaleinps/default.aspx?itemdir=46888

ISTAT (2019a). Il mercato del lavoro: un bilancio degli ultimi dieci anni. *Il mercato del lavoro 2018. Verso una lettura integrata*, Ch. 1. https://www.istat.it/it/archivio/227606

ISTAT (2019b). Il sottoutilizzo del lavoro in Italia. Domanda di lavoro delle imprese e disallineamento formativo, *Il mercato del lavoro 2018. Verso una lettura integrata*, Ch. 2 & 3. https://www.istat.it/it/archivio/227606

ISTAT (2019, 2018). Livelli di istruzione della popolazione e ritorni occupazionali: i principali indicatori. *Statistica Report*.

ISTAT (2014). Il mercato del lavoro negli anni della crisi: dinamiche e divari Prf. 3.4.1. I giovani tra difficoltà di ingresso e scarse opportunità in Italia e in Europa. *Rapporto Annuale - La situazione del Paese nel 2013*, Ch. 3.

ISTAT (2013). Il mercato del lavoro tra minori opportunità e maggiore partecipazione. Prf. 3.4.1. Opportunità di occupazione dei giovani diplomati e laureati. *Rapporto Annuale – La situazione del Paese nel 2012*, Ch. 3.

ISTAT (2010). La crisi e la sostenibilità. Prf. 4.3.2.2.I giovani che non lavorano e non studiano: un fenomeno in crescita. *Rapporto Annuale – La situazione del Paese nel 2009*, Ch. 4.

Jugnot, S. & Minni, C. (2018). Quelques trimestres de mauvaise conjoncture à l'entrée du marché du travail ne suffisent pas à dégrader durablement les conditions d'insertion des jeunes. *In: Couppié T.* et al. (eds). *20 ans d'insertion professionnelle des jeunes : entre permanences et évolutions,* pp.33-40. Céreq Essentiels. https://www.cereq.fr/20-ans-dinsertion-professionnelle-des-jeunes-entre-permanences-et-evolutions

Kogan, I. & Muller, W. (Eds.). (2003). School-to-Work Transitions in Europe: Analyses of the EU LFS 2000 Ad Hoc Module. MZES, Mannheim. http://www.mzes.uni-mannheim.de/publications/books/school_to_work_2ed.pdf

Krugman, P. (1994). Past and prospective causes of high unemployment. *Economic Review*, Federal Reserve Bank of Kansas City, IV(1), 23–43. http://www.kc.frb.org/publicat/econrev/pdf/4q94krug.pdf

Leonardi, M. & Nannicini, T. (2016). I primi risultati del Jobs Act. *L'Unità*, 17 febbraio.

Ludovico, G. (2017). Contratto a tempo determinato versus contratto a tutele crescenti. ADAPT University Press, *Working paper* N°14. https://moodle.adaptland.it/pluginfile.php/30566/mod_resource/content/0/wp_14_2017_ludovico.pdf

Müller, M. & Gangl, W. (2003). *Transitions from Education to Work in Europe: the Integration of Youth into EU Labour Markets*. Oxford: Oxford University Press.

Noelke, C. (2016). Employment Protection Legislation and the Youth Labour Market. *European Sociological Review*, 32(4), 471–485. https://doi.org/10.1093/esr/jcv088

OECD (2020). Employment Outlook – Facing the Jobs Crisis. Paris: OECD Publishing. http://www.oecd.org/employment-outlook/2020/

OECD (2019b). Economic Surveys: Italy 2019. Paris: OECD Publishing. https://doi.org/10.1787/369ec0f2-en

OECD (2019a). Recent trends in the Italian Labour Market. In: *Strengthening Active Labour Market Policies in Italy.* Paris: OECD Publishing. https://doi.org/10.1787/575fd92c-en

OECD (2019c). Employment Outlook. Ch. 2. Paris: OECD Publishing. https://www.oecd-ilibrary.org/employment/oecd-employment-outlook-2019_9ee00155-en

OECD (2019d). Education at a Glance. Paris: OECD Publishing. https://www.oecd-ilibrary.org/education/education-at-a-glance-2019_f8d7880d-en

OECD (2010). Off a good start? Jobs for Youth. Ch. 3. Paris: OECD Publishing. https://www.oecd-ilibrary.org/fr/off-to-a-good-start-jobs-for-youth_5km63dtc5q43.pdf?itemId=%2Fcontent%2Fpublication%2F9789264096127-en&mimeType=pdf

OECD (2008). Employment Outlook. Ch. 1. Paris: OECD Publishing. https://www.oecd-ilibrary.org/employment/oecd-employment-outlook-2008_empl_outlook-2008-en

OECD (2000). From Initial Education to Working Life. Making Transitions Work. Paris: OECD Publishing. https://www.oecd-ilibrary.org/education/from-initial-education-to-working-life_9789264181816-en

OECD (1994). The OECD Jobs Study. Paris: OECD Publishing. https://www.worldcat.org/title/oecd-jobs-study-evidence-and-explanations/oclc/31389050?referer=di&ht=edition

Passaretta, G. & Wolbers, M. (2016). Temporary employment at labour market entry in Europe: Labour market dualism, transitions to secure employment and upward mobility. *Economic and Industrial Democracy,* june 2016. https://doi.org/10.1177/0143831X16652946

Pastore, F. (2017). Why so slow? The School-to-Work Transition in Italy. GLO *Discussion Paper* N° 65. http://hdl.handle.net/10419/157538

Pastore, F. (2015). *The Youth Experience Gap. Explaining National Differences in the School-to-Work Transition*. Heidelberg: Physica Verlag.

Pastore, F., Quintano, C. & Rocca, A. (2020). Stuck at a Crossroads? The Duration of the Italian School-To-Work Transition. IZA *Discussion Paper* N°13462. http://ftp.iza.org/dp13462.pdf

Quintini, G., Martin, J.P. & Martin, S. (2007). The Changing Nature of the School-to-Work Transition Process in OECD Countries. IZA *Discussion Paper* N°2582. http://ftp.iza.org/dp2582.pdf

Quintini, G. & Manfredi, T (2009). Going Separate Ways? School-to-Work Transitions in the United States and Europe. OECD Social, Employment and Migration Working Papers N° 90. https://doi.org/10.1787/221717700447.

Ryan, P. (2001). The school-to-Work Transition: A Cross-national Perspective. *Journal of Economic Literature*, 39(1), 34–92. https://www.jstor.org/stable/2698454

Reyneri, E. (2017). Occupazione in ripresa. Però di bassa qualità. *Lavoce.info.* https://www.lavoce.info/archives/48649/occupazione-ripresa-la-qualita-bassa/

Scarpetta, S., Sonnet, A. & Manfredi, T. (2010). Rising youth unemployment during the crisis: How to prevent negative long-term consequences on a generation? OECD *Social, Employment and Migration Working Papers* N° 106. https://doi.org/10.1787/5kmh79zb2mmv-en

Scherer, S. (2004). Stepping-stones or traps? The consequences of labour market entry positions on future career in West Germany, Great Britain and Italy. *Work, Employment and Society*, 18(2), 369–394. https://doi.org/10.1177/09500172004042774

Sestito, P. & Viviano, E. (2016). Hiring incentives and/or firing cost reduction? Evaluating the impact of the 2015 policies on the Italian labour market. *Collana Questioni di economia e finanza – Occasional papers, Banca d'Italia, 325***.** https://www.bancaditalia.it/pubblicazioni/qef/2016-0325/QEF_325_16.pdf?language_id=1

Suta, C., Barbieri, L. & May-Gillings, M. (2019). Recent graduates in employment – Understanding EU targets and drivers. ROA Workshop on Dynamics of Skills Supply and Demand, Maastricht 17-18 Nov. 2018. Brussels: Cambridge Econometrics. https://www.camecon.com/what/our-work/recent-graduates-in-employment-understanding-eu-targets-and-drivers/

Tiraboschi, M. (2012). Italian Labour Law after the so-called Monti-Fornero Reform (Law No. 92/2012). ADAPT University Press, *E-Journal of International and Comparative Labour Studies*, 1(3-4). https://www.semanticscholar.org/paper/Italian-Labour-Law-after-the-So-Called-Reform-(Law-Tiraboschi/793fe045e0e3fbcb1818a7d23238e4cd6831fd44

van der Velden, R.K.W. & Wolbers, M.H. (2008). A Framework for Monitoring Transition Systems. OECD *Education Working Papers* N° 20. https://doi.org/10.1787/221381866820

Spatial Disparities in Young Adults' Early Residential Independence in France

Claire Kersuzan* and Matthieu Solignac**

Abstract – Leaving the parental home happens at a relatively young age in France but not much is known about spatial variations in this. Using data from the DREES-Insee ENRJ survey (*Enquête nationale sur les ressources de jeunes*, a national survey on the resources of young adults), this work analyses the differences in accessing independent accommodation between the age of 18 and 24 according to parental home location. Young adults leave home considerably sooner outside large towns and cities, in the large majority of cases when pursuing studies: 80% of young people from rural areas or small towns have left home before the age of 25, compared with 40% of young Parisians. The former's parents more commonly support them in leaving home, in particular with financial assistance. While there is little variation in the average amount of regular support provided according to parental area of origin, this nevertheless equates to a significantly higher burden-to-income ratio for parents living outside large Urban Units, in particular for young adults still studying, and the amounts given cover different items of expenditure.

JEL Classification: J13, R23, D64, Z13
Keywords: leaving home, spatial inequalities, transition to adulthood, young adult, housing, accommodation, parent, intergenerational transfers

** Université de Bordeaux, CNRS, Comptrasec, UMR 5114, (claire.kersuzan@u-bordeaux.fr) ; ** Université de Bordeaux, CNRS, Comptrasec, UMR 5114, et Institut national d'études démographiques (INED)*

This work received a grant under the Investissements d'avenir Programme ANR-10-EQPX-17 (CASD) and ANR-16-CE41-0007-01 (Big_Stat project), support from the IdEx Bordeaux (ANR-10-IDEX-03-02) and LabEx iPOPs (ANR-10-LABX-0089) and a grant from the Nouvelle-Aquitaine region. Access to the METRIC tool (MEsure des TRajets Inter-Communes / Carreaux) for measuring distances and journey times between municipalities was provided by the Quételet network (Quetelet-Progedo Diffusion, reference APF-0004).
We would also like to thank Jérôme Fabre and Émilie Pawlowski (Insee) for sharing their typology on the availability of training within local education authority areas. Lastly, our thanks go also to the two anonymous reviewers whose constructive comments allowed us to improve this paper.

Matthieu Solignac, with whom this work was carried out, passed away in December 2020. Matthieu was a brilliant researcher in demography, a valuable colleague and a friend; he is sorely missed.

Received in October 2018, accepted in October 2020. Translated from "Les disparités spatiales d'accès à l'autonomie résidentielle précoce en France".

Citation: Kersuzan, C. & Solignac, M. (2021). Spatial Disparities in Young Adults' Early Residential Independence in France. *Economie et Statistique / Economics and Statistics*, 522-523, 61–80. https://doi.org/10.24187/ecostat.2021.522d.2036

Despite the extended length of studies and longer time taken to secure stable employment, social pressure and the aspiration for independence at a young age remain particularly strong for young French adults (Cichelli, 2015; Van de Velde, 2012). Among the markers of this emancipation, leaving the parental home, with the access to independent accommodation that it implies, constitutes a significant event on which society places considerable importance (Mulder, 2009; Van de Velde, 2008; Amsellem-Mainguy, 2016). Now the age and patterns for leaving home may differ considerably according to the young adults' region of origin. If the parental home is a long way from centres of education and employment, this is liable to encourage young adults to leave home at a young age, with geographical mobility to urban areas that offer more facilities or opportunities. Leaving home to somewhere less distant may also be prompted by more affordable property prices, especially for people setting up home together as a couple or starting their working career at a younger age. The heterogenity in the transition to adulthood can be seen through the spatial dimension of access to residential independence.

However, little is known about the scale of sub-national spatial variations in the process of leaving home, in its different forms. Literature on the subject remains very fragmented, with most works being restricted to certain particular areas (Renahy, 2005; Gambino & Desmesure, 2014; Thissen *et al.*, 2010), focused on a specific category of young people (Lemistre & Magrini, 2010; Fabre & Pawloski, 2019; Dufour-Kippelen, 2001), or centred on a particular type of mobility, notably including a move from one administrative region to another (Dumartin, 1995). While these works provide a glimpse of the great regional diversity in practices, the specific features of each approach make it hard to compare results. Hence the interest in offering a standardised comprehensive overview of the spatial variations in practices as regards people in France leaving home at a young age, according to the region they are leaving.

Grasping the spatial dimension of achieving residential independence involves an analysis based on data representative of all young adults and their parents across the entire French territory. The primary objective of this work is to draw up a precise statistical picture of the association between location of parental home and the timing, reasons and conditions for young adults to achieve residential independence. The second objective is to study the consequences for the parents in each region of these spatial disparities in access to residential independence, as regards covering costs during the young person's school-to-work transition period.

This analysis, based on data from the DREES-Insee ENRJ survey (*Enquête nationale sur les ressources de jeunes*, a national survey on the resources of young adults), concerns young people aged 18 to 24 in 2014. These first years of adulthood are a time of intense residential mobility, which plays a part in redrawing the local socio-demographic composition (Dumartin, 1995; Bergouignan, 2009) through the spatial sorting of young adults (Berck *et al.*, 2016). Whilst there is still an association with basic life decisions (field and length of studies, entering the labour market, setting up home as a couple, etc.), young adults' access to independent housing is largely conditional on the level of family transfers, due to their own level of income and the emphasis on family values inherent in the French social system (Déchaux, 2007). So, there is an association between parental home location and specific issues in regard to leaving home at a young age and the material and financial support provided by parents.

Leaving home before the age of 25 occurs in the large majority of cases when pursuing studies and is more common among people who are not from large towns or cities: 80% of young adults from rural areas or small towns leave home by the time they are 25, compared with 40% of young adults from the Greater Paris Area. These disparities according to parental home municipality can be explained by socio-demographic factors and/or certain characteristics about the parental home location, such as distance from universities, which concerns leaving home to move somewhere a long distance away, and the cost of accommodation when leaving home to move somewhere nearby. Even after introducing these characteristics, however, the probability of leaving home is still two to three times lower in the Paris Urban Unit than in other areas. These spatial variations are accompanied by unequal reliance on parents, with those from rural areas more commonly giving the young adult support, in particular financial assistance, in order to leave home. While the amount of regular support given by parents is similar regardless of the region where they live, this support represents a greater burden for parents living outside large Urban Units, in particular where it concerns young adults still pursuing their studies, and covers different areas of expenditure.

The first section puts into perspective this paper's contribution to the literature on leaving home. The second section is dedicated to the data from the ENRJ survey. The third section examines the regional disparities in the timing and conditions for first leaving the parental home, while the fourth section considers these regional disparities with reference to the differences in parental involvement in this process.

1. Leaving Home: Assessment of the Situation from a Spatial Perspective

1.1. Leaving the Parental Home

The median age for young French adults to leave their parental home for the first time is about 23, which is quite early in comparison to young people in Southern Europe and Ireland (27-28) but later than for young British and Nordic European adults (20-21) (Van de Velde, 2008; Amsellem-Mainguy, 2016). Contrary to widespread belief, this age has remained relatively stable in the last forty years (Galland, 2000; Régnier-Loilier, 2006). The models for achieving residential independence, on the other hand, have been transformed due to the effect of economic and social changes[1] (Robette, 2020). The model for permanently leaving home through one's own financial means, often linked, in the case of men, to them getting their first job and, in the case of women, to marriage, is not necessarily straightforward any longer. Achieving residential independence has become a lengthy process with variable forms, frequently carried out in stages and which very often does not put an end to the young adult's financial dependence on their parents (Villeneuve-Gokalp, 1997).

In recent decades, studies on leaving home in France have revealed substantial disparities in the timing and conditions for leaving the parental home according to the various socio-economic and family characteristics of the young adults and their parents. These studies show that, in comparison with young men of exactly the same age and level of education as them, a lower proportion of young women live with their parents and a higher proportion live with a partner (Castell *et al.*, 2016). Those with permanent employment contracts are more likely not to live at home, whereas the probability of leaving home is lower for those who are unemployed or not working, although gaining employment would not appear to be one of the main drivers for leaving the parental home (*ibid*; Dormont & Dufour-Kippelen, 2000; Mora *et al.*, 2008; Portela & Dezenaire, 2014). Moreover, access to independent accommodation is common in young adults in higher education (Castell *et al.*, 2016; Menard & Vergnat, 2020), thus characterising "the privilege of the successful" (Solard & Coppoletta, 2014). With regard to family factors, leaving home happens sooner in the event of parental separation, the death of a parent or the presence of a step-father or step-mother (Bellidenty, 2018; Laferrère, 2005; Bozon & Villeneuve-Gokalp, 1995) whilst a higher number of siblings increases the probability of a young person leaving home (Castell *et al.*, 2016; Despalins & de Saint Pol, 2012). Parental income can have contradictory or even paradoxical effects (Laferrère, 2005): while high income can finance the move away from home, it can also delay it by offering housing conditions that may encourage young adults to continue living with their parents for longer. However, it is less common for young students from modest backgrounds to leave home during their studies (Herpin & Verger, 1997; Robert-Bobée, 2002). When young adults from a working-class background and with a lower level of education leave home, it tends to involve a move of a shorter distance and is often linked to setting up home with their partner (Fabre & Pawlowski, 2019; Margirier, 2004).

1.2. Spatial Dimension to Leaving Home and Young Adult Mobility

Many studies have tackled the issue of residential mobility and location. Following the work of Sjaastad (1962), residential mobility is understood to be a form of investment in human capital, with the costs of migration having to be offset by the benefits it will generate: migration must, in particular, provide access to more favourable local labour markets. Access to initial training, allowing expectations of a higher standard of living, follows a similar principle for young adults not yet in work. The field of urban economics developed in particular around the effects of urban agglomeration (Behrens *et al.*, 2015; Combes & Gobillon, 2015), highlighting the various mechanisms for the spatial sorting of individuals by size of town or city. This sorting may take place notably through parental choices about location, making birthplace a decisive factor in determining wages (Bosquet & Overman, 2019). In the wake of Rosen (1974) and Roback (1982), general equilibrium models that have been developed incorporate the charms and attractions specific to each town or city, which play a part in determining wages and rents. Amongst these features, the range of

1. Increasing length of studies and longer period for getting a job, change in family relations and, more recently, the increase in housing costs.

higher education programmes and institutions available can affect standard of living, through the skills generated locally, and the interaction and selection of individuals moving to and remaining in the biggest towns and cities (Diamond, 2016). Housing characteristics and the attributes of the place (natural attractions such as the landscape and climate, transport services, leisure and cultural facilities, etc.) can work in the same way. Détang-Dessendre & Piguet (2017) show that unlike older people, young adults, especially the most highly qualified, base their mobility choices more on local training and labour market characteristics than on the natural charms and attractions offered by regions. Eyméoud & Wasmer (2016) nevertheless point out the difficulty young adults face in accessing the most dynamic areas in terms of training and employment, which also have the most strained property markets. While the appeal of towns and cities is evident, they seem to hold less attraction for young adults with a lower level of education, who show a greater tendency to remain in rural areas (Détang-Dessendre *et al.*, 2008). This economic literature is also heavily focused on the link between migration and the labour market, generally restricting itself to individuals already in work (Gobillon, 2001) and often neglecting rural areas.

While demonstrating that geographical mobility is higher in young adults than in other age groups (Baccaïni, 2009; Delance & Vignolles, 2017), analysis of domestic mobility within France tends to confirm the attraction young adults feel for areas with better training and employment potential. So, mobility in young adults, which is also different from that of other age groups in terms of the greater distances involved (Baccaïni, 2001), leads them to move mainly to large urban areas, notably the regional capitals (Baccaïni, 2007; Couet, 2006). These studies also highlight the importance of region of origin. In the period from 1990 to 1999, residential mobility was higher for 18-24-year-olds from Urban Units with a population of less than 100,000 than for those from larger Urban Units, especially in the case of moves to another *département*. Moving home is less common among young adults from rural municipalities and generally involves shorter distances, within the same municipality or *département* (Couet, 2006). Other studies about young people who have finished secondary school having gained their Baccalauréat qualification, or those entering the labour market for the first time, also corroborate the significant effect of the place of origin's characteristics on mobility and school-to-work trajectories (Fabre & Pawlowski, 2019; Margirier, 2004). But while these studies may point out the crucial role played by a young adult's region of origin on residential mobility, their aggregate nature combines a very varied array of movements: moving home with parents, leaving home for the first time, leaving home again on subsequent occasions to move in with a partner or in relation to births, returning to the parental home, etc. The results obtained are also sensitive to the spatial framework chosen for analysis (the MAUP, Modifiable Areal Unit Problem). In particular, where mobility is defined as a change of residential administrative unit, all cases of people leaving home to move somewhere in the same administrative unit will be likened to immobility. A proportion of cases where people leave home to move somewhere a short distance away, which is particularly common in rural areas, is thus liable to be overlooked.

Few works provide any detailed analysis of achieving residential independence at a young age in connection with parental home location (Mulder, 2009). Spatial variations have often only been considered in the context of comparisons between countries. It is then a question of bringing to light the structural forces of the national systems directing young adults' access to independent housing (Van de Velde, 2008; Gaviria, 2005; Cavalli *et al.*, 2008). There are a few exceptions, however.

Lastly, the rare studies that have considered parental home location as a key determining factor in transition to adulthood are generally focused on a particular type of area, notably the rural environment. Young adults from rural areas, with comparable social backgrounds and educational level to their urban counterparts, are more likely to favour short vocational training courses, as these are overrepresented in the range of educational options available in rural locations (Cereq, 2011; Coquard, 2015; Arrighi, 2004). The explanations put forward include the extra financial and psychological cost associated with the requirement for residential mobility in order to pursue studies and the strength of their attachment to the region (Bouquet, 2018). Other works, however, paint a more nuanced picture concerning socio-demographic immobility in young people from these areas, emphasising the growing imperative among young adults from rural areas to take longer higher education or post-graduate courses (Alpe, 2018; Orange & Renard, 2018). Conversely, Laferrère (2005) qualifies the picture regarding mobility in young adults from urban areas: a spacious parental home in an urban area encourages them to stay at home.

1.3. Spatial Dimension to Leaving Home and Parental Support

The role of financial support from the family to access personal accommodation takes on particular importance in France where the accepted convention of independence at a young age contrasts with the low level of public support in achieving this. Unlike the universalist approach to youth care in Scandinavian social-democracies, French public policies are mostly organised on the principle of the family covering the cost of the period spent studying, training and getting established in a job. Consequently, public support is aimed more at parents than at young adults under the age of 25, who remain largely excluded from access to the statutory minimum allowances (Magord, 2016).

Admittedly, young adults aged 18-24 can receive certain social transfers directly. So, student status gives access to grants, which are still means-tested according to parental income, however, while taking into account, in an incidental way, the distance between parental home and place of study. However, these grants are not designed to replace parental support, as the size of grant often remains well below what is needed to cover all the expenses associated with residential independence (Chevalier, 2018). Moreover, the granting of housing benefits, open to anyone aged 18 and over (Van de Velde, 2014) differentiates France from the extreme family-centric welfare state approaches of Southern European countries, where family values and strong family ties do little to encourage people to leave home at a young age (Holdsworth, 2004). Although the housing allowance (APL, *Allocation personalisée au logement*) seems to have made it easier for students to leave home (Laferrère & Le Blanc, 2004), its legitimacy is frequently contested (Fack, 2005).

In a context characterised by the increasing length of studies, difficulties in getting established in a job and the growing strain on the housing market, parental resources and intergenerational support constitute increasingly decisive factors in young adults moving into personal accommodation (Vanoni, 2013; Maunaye, 2016). A number of authors highlight the misguided consequences of this emphasis on family values in public support systems, which might encourage the deepening of social inequality (Herpin & Déchaux, 2004; Majamaa, 2013; Castell *et al.*, 2016; Déchaux, 2007; Grobon, 2018). Nevertheless, despite the expected influence of parental home location on young adults' residential trajectories, little work has been done on investigating the regional variability in parental support.

2. Data

The data used in this paper are from the *Enquête nationale sur les ressources des jeunes* (ENRJ, a national survey on young adults' resources), conducted jointly by DREES (the statistical department of the French Ministry of social affairs) and Insee in October 2014 among 5,776 young adults aged 18 to 24, living in an ordinary household or in a community, and the parents[2] of these young adults. This survey is representative of all young adults in France, whether living at home with their parents or in independent accommodation, thus avoiding selection bias. The survey also has the advantage of collecting information both from young people and their parents. It thus provides detailed information about the type of municipality where the parental home is located, details of the first time the young adults left home (if ever), and the various kinds of parental support provided, notably to help them move into independent accommodation. The ENRJ survey therefore goes beyond just the young adult's residential situation observed at the time of the survey, and helps to reconstitute the path they take to living separately, starting from when they first leave the parental home.

2.1. Characterisation of Parental Home Location

The location of the parental home[3] is defined on the basis of the Urban Unit[4] size category to which it belongs. The explanation for this approach is the limited size of the survey sample, the representativeness of which is ensured at a national level but not at a more detailed geographic level. In order to make it easier to interpret the results and have sufficiently large numbers of people within each category, the nine classes of Urban Unit have been aggregated to distinguish between rural areas, small urban areas (Urban Units with a population of 2,000 - 19,999), medium-sized urban areas (Urban Units with a population of 20,000 - 199,999), large urban areas (Urban Units with a population of 200,000 - 1,999,999)

2. Throughout this paper, the term "their parents" is used for convenience, whether the parents are living together, separated or single. More details will be provided below about how the case of separated parents is handled.
3. This location is only known as of the time of questioning. However, as the median time lag between the young adult first achieving residential independence and the survey date is limited to a year, this location may be likened to the parental home municipality prior to the young person first leaving home, without major risk of distortion.
4. An Urban Unit is defined by Insee as "a municipality or group of municipalities ('communes' in French) with a minimum population of 2,000 across its continuous built-up area and where no more than 200 metres separates any two dwellings. Moreover, each municipality concerned has over half of its population concentrated in this continuous built-up area". Municipalities that do not constitute an Urban Unit are classed as rural.

and the Urban Unit of Paris. For certain analyses, they are split into three groups: the Urban Unit of Paris together with large urban areas, small or medium-sized urban areas, and rural municipalities.

2.2. Identifying First Home-Leaving

We have information about the young adults' age when they first moved into accommodation other than their parental home (if ever), whether or not they pay for this accommodation themselves, and whether or not the young adult alternates between this accommodation and their parental home. The young adults also provide information on the main reason for first leaving home and the distance between that first accommodation and their parental home.[5] With the exception of certain events (parents splitting up, first job, first stable romantic relationship), most of the characteristics regarding the young adults and their parents are also measured as of the survey date. It is therefore not possible to look at the young adults' residential history in comparison with all earlier characteristics.

2.3. Measuring Material and Practical Support Provided by Parents

Young people who have had a first experience of residential independence are questioned about the type of support, if any, that they received from their parents to move in and get settled: help with finding accommodation, doing alterations to it, or paying the rent. The amounts and detailed forms of support (acting as guarantor, paying the deposit, paying all or part of the rent, support in moving in) are only provided by the parents and only if the young adult usually lives (i.e. for at least one month in the year) in personal accommodation at the time of the survey.[6] Similarly, the overall annual amount of financial support given by the parents, whether the young adult has left home or not, is known as of the time of the survey. It is therefore possible that this information does not accurately reflect the support given when they first left the parental home.

Our reference unit is the young adult, unlike Grobon (2018) who talks in terms of parental households. Parental income equates to the total combined personal income of each parent[7] rather than household disposable income, which could encompass the young adult's income. The type and amount of support received by the young adult is as declared in the survey. In this respect, the approach is different from that adopted by Castell *et al.* (2016), where the young adults' statements are given preference, even if different from those given by the parents.

3. Disparities in Early Residential Independence by Place of Parental Home

3.1. Earlier Home-Leaving in the Countryside and Small Towns than in Large Urban Areas

The proportion of young adults getting their first experience of residential independence at a young age varies substantially by location of transition to adulthood. Before the age of 25, about 4 out of 10 young adults from the Urban Unit of Paris have lived in accommodation other than their parental home, compared with nearly 8 out of 10 from rural municipalities or small Urban Units (Figure I).[8] Where this happens, the average age at which young adults from the capital and other large urban areas leave home for the first time is older (22-23) than is the case for other young adults (20-21). Half of young adults from rural areas or small to medium-sized urban areas leaving home for the first time do so when they come of age, whereas it is more common for young adults from larger urban areas to do so after the age of 21.

3.2. Leaving Home Most Often Linked to Studying

Before the age of 25, the differences between young adults from urban areas and other young adults in achieving residential independence can mostly be explained by mobility related to the pursuit of studies (Figure II). About half of young adults from rural municipalities and small or medium-sized urban areas first leave the parental home before the age of 25 to pursue their studies, often when entering higher education (aged 18-19). Out of young adults from large urban areas, fewer than 3 in 10 leave home for the first time in order to study and are older when they do so. Leaving the parental home for the first time to get work or move in with a partner happens relatively infrequently before the age of

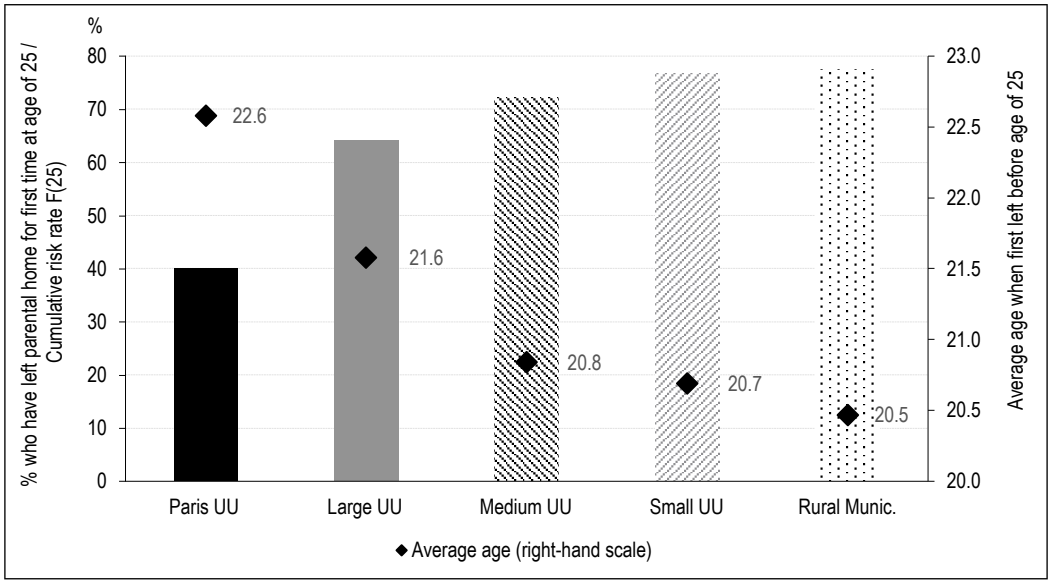
5. However, no further details are available on the place to which they moved.

6. Note that the monthly amount paid to young adults that is not preallocated for a set purpose means it is not possible to get a precise measurement of the total support used to pay the rent.

7. If the parents are separated, they are paired together again for the purposes of determining parental income. Where the young adult's parents are living as a couple at the time of the survey (67%) or where one of them is deceased (8%), the information on the support received by the young adult is derived from the statement made by one parent about the support provided by their household. Where the young adult's parents are separated, the support given to the young adult is calculated based either on the statement made by both parents (12%), or that of the sole parent encountered during the survey (14%). In half of all cases where one of the separated parents could not be interviewed, the young adult no longer had a relationship with that parent.

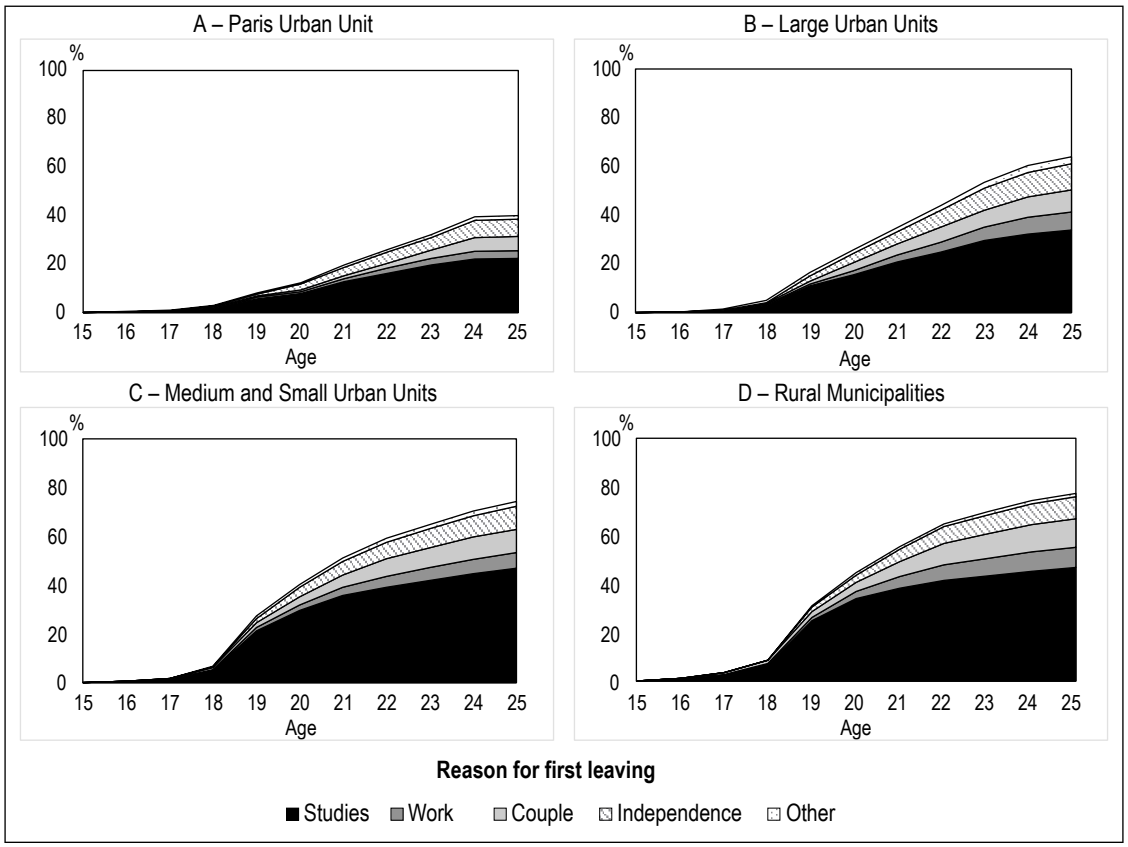
8. Assuming there is little variation in the rate of achieving residential independence for the first time over the seven cohorts surveyed in the ENRJ.

Figure I – **Percentage of young adults who have left parental home for the first time at age of 25 (cumulative risk rate) and average age when first left**



Note: The cumulative risk rate at age 25 F(25) corresponds to the estimated probability that a young person has left the parental home for the first time before his or her 25th birthday. It results from the cumulated instant probabilities of decohabitation calculated over each year of age from 15 to 24. The instant probability of decohabitation over an age interval t_i is the conditional probability that a young person will leave the parental home for the first time over this interval knowing that he or she has not yet leaved the parental home until t_i.
Reading Note: At the age of 25, 40% of young adults originally from the Paris Urban Unit have left their parents' home for the first time, compared with just under 80% of young adults whose parents live in a rural municipality. The average age of young adults from the Greater Paris Area when they first left home was 22.6, compared with 20.5 for young adults from a rural municipality.
Sources and Coverage: DREES-Insee, *Enquête nationale sur les ressources des jeunes 2014* (ENRJ); 4,950 young adults aged 18-24 in 2014 (26,298 young adult-years).

Figure II – **Distribution of reasons for first leaving by age at time of leaving and parental home municipality type**



Reading Note: At the age of 25, 47% of young adults originally from a rural municipality left their parental home for the first time in order to pursue studies, 8% for work purposes, 12% to set up home with their partner, 9% to seek independence and 2% for some other reason.
Sources and Coverage: DREES-Insee, *Enquête nationale sur les ressources des jeunes 2014* (ENRJ); 4,950 young adults aged 18-24 in 2014 (26,298 young adult-years).

25 (7% and 9% of young adults, respectively). However, these departures concern young adults from rural municipalities (20%) more than those from the Urban Unit of Paris or large Urban Units (12%).

These results emphasise the role played by the training and employment opportunities offered locally, meaning that it is easier for young adults from large urban areas to pursue their studies or start their working career without leaving the parental home. Conversely, young adults from areas offering few options for them to pursue their studies are forced to leave. But other factors such as housing costs or regional norms regarding transition to adulthood may also contribute to these differences.

3.3. Moving Further Away from Home in Large Urban Areas

More than half of young adults who achieve residential independence before the age of 25 move more than 50 km away from where their parents live (Table 1). The primary reason for this distance is to pursue studies, which on average involves a broader radius of movement than the other reasons for leaving home for the first time. Where the first experience of residential mobility is associated with work or studying, distance from the parental home is greater for young adults from larger Urban Units: 2/3 of them move over 100 km away from the parental home, compared with fewer than half of young adults from other areas. In the largest Urban Units, the wide variety of higher education options and transport facilities limit the need for residential mobility for study purposes to a few highly specialist degree courses and career paths. Conversely, young adults from rural municipalities and small or medium-sized urban areas are more obliged to move home right from when they first embark on higher education programmes. Getting independent accommodation for the first time to set up home with a partner or to gain some independence is, on the other hand, associated with significantly more limited mobility, regardless of parental home municipality type.

3.4. Marked Spatial Differences by Gender and Social Background

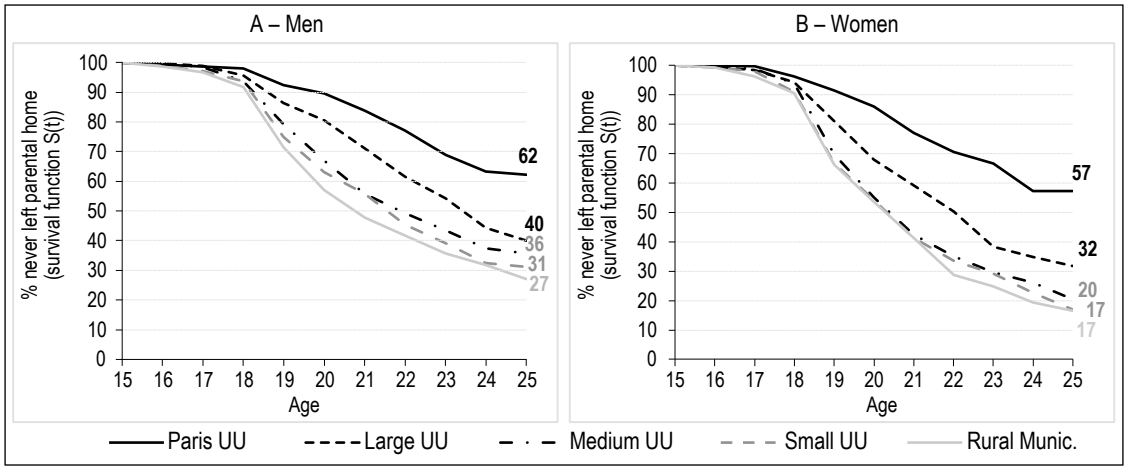
Regardless of region of origin, young women leave their parental home earlier than young men (Figure III). This difference is mainly due to them leaving for reasons other than to study. Although leaving home at a young age for work purposes is slightly less common among young women (-5 percentage points), they are more likely than young men to leave their parental home before the age of 25 to live with a partner (+9 points) and, to a lesser extent, to gain some independence (+5 points). This

Table 1 – **Distribution of first home-leaving by distance (km) from parental home and reason for leaving**

	Parental Home Municipality Type			
	Paris UU / Large UU	Medium / Small UU	Rural Munic.	Overall
Irrespective of reason for leaving				
<10	20.9	14.9	12.4	16.0
[10-49]	20.7	25.6	27.9	24.8
[50-99]	10.4	22.7	25.9	20.0
100 or more	48.0	36.9	33.7	39.2
Overall	100.0	100.0	100.0	100.0
Leaving to study or for work				
<10	3.0	2.1	1.6	2.2
[10-49]	16.5	21.9	21.2	20.3
[50-99]	14.1	29.7	34.0	26.7
100 or more	66.4	46.4	43.3	50.9
Overall	100.0	100.0	100.0	100.0
Other reasons for leaving				
<10	53.1	47.3	39.3	47.2
[10-49]	28.3	34.8	44.6	35.1
[50-99]	3.9	5.1	6.0	4.9
100 or more	14.8	12.8	10.7	12.8
Overall	100.0	100.0	100.0	100.0

Reading Note: Out of all young adults who have left home and are originally from the Paris Urban Unit or other large Urban Unit, 20.9% moved less than 10 km from their parental home.
Sources and Coverage: DREES-Insee, *Enquête nationale sur les ressources des jeunes 2014* (ENRJ); 2,836 young people aged 18-24 in 2014 who have left home for the first time.

Figure III – **Percentage of young adults who have never left the parental home**



Note: The survival function denoted S(t) is a function of time t (expressed here in years of age) which quantifies the estimated proportion of young people who have not yet left the parental home at an age t_i since the age of 15 (t_0). The probability of not having left the parental home at time t_i is thus the probability of not having left the parental home before t_i multiplied by the conditional probability of not having left the parental home at time t_i.
Reading Note: At the age of 25, 62% of young men and 57% of young women originally from the Paris Urban Unit have never left their parental home, compared with 27% of young men and 17% of young women from a rural municipality.
Sources and Coverage: DREES-Insee, *Enquête nationale sur les ressources des jeunes 2014* (ENRJ); 4,950 young adults aged 18-24 in 2014 (26,298 young adult-years).

difference between men and women can be seen regardless of parental home municipality type, but is less marked in the Urban Unit of Paris, where it is rarer to leave home before the age of 25 to live with a partner. Young women who leave home to live with a partner are more inclined to stay close to the parental home. But, in terms of the distance associated with mobility, there is little distinction between men and women first leaving home for the same reason.

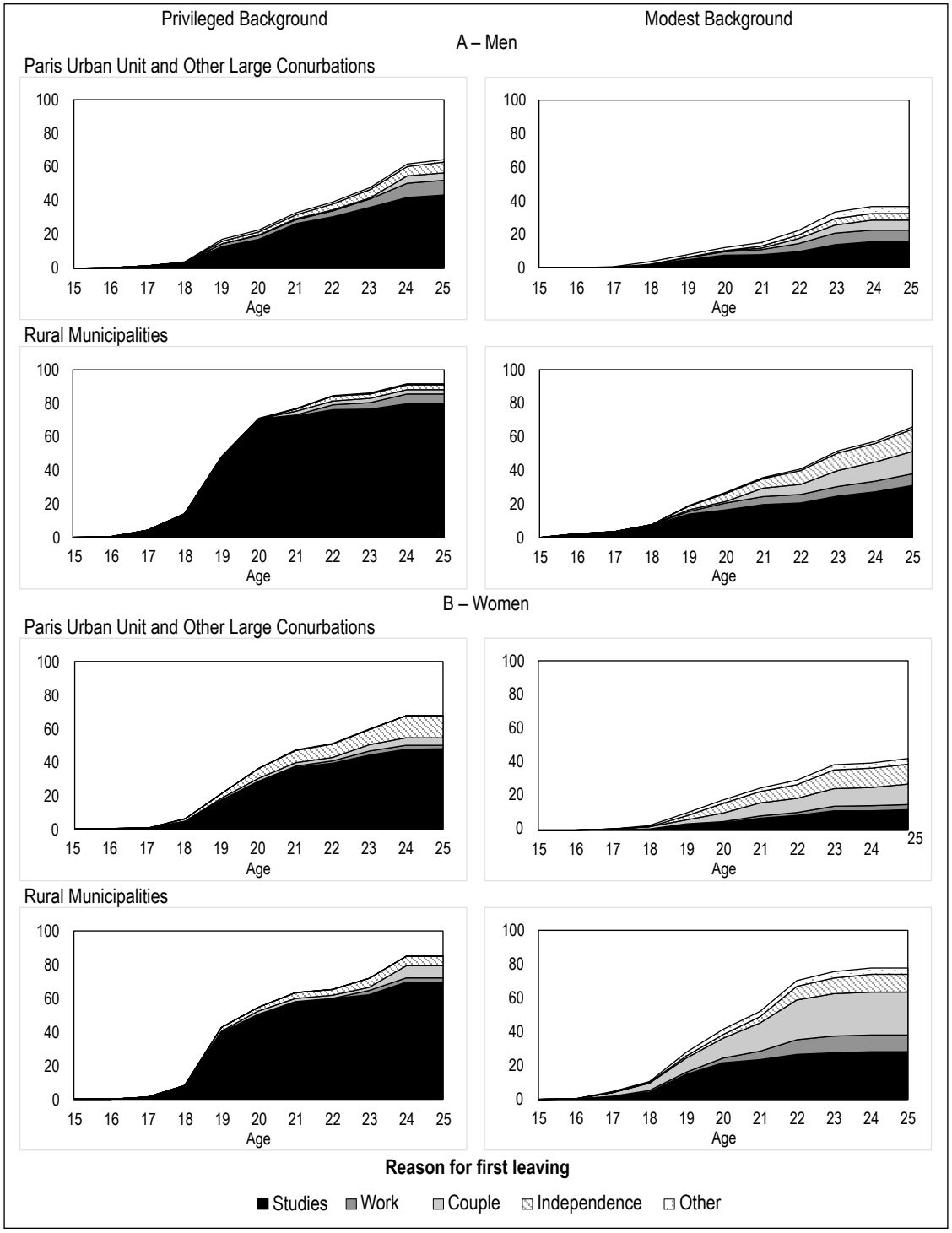
Leaving home to live with a partner at young ages occurs more among young women from working class backgrounds:[9] 20% compared with 5% of young women from privileged backgrounds. This "movement for domestic emancipation" (Bloss, 2008) is also a more common occurrence if the parental home is in a rural municipality or small urban area. So, a quarter of young women from working class backgrounds whose parents live in a rural municipality have left their parental home to move in with a partner, compared with 11% of young women whose parents live in the Urban Unit of Paris or other large urban area (Figure IV). However, studying is still the main reason for leaving home for the first time at a young age, regardless of gender, parental home municipality type or social background. Residential independence at a young age to pursue studies is, however, much more common among young adults from privileged backgrounds. Where parents live in a rural municipality, 8 out of 10 young men and 7 out of 10 young women from privileged backgrounds left their parental home for the first time in order to study, compared with only 3 out of 10 young people from working class backgrounds (young men and women alike). There is a link between social differences in achieving residential independence at a young age and social differences in leaving to pursue studies; in comparison with young adults from privileged social backgrounds, it is decidedly less common for young people from modest backgrounds to leave their parental home before the age of 25. One exception to this, however, concerns young women from working class backgrounds in rural areas who, because of the proportion of them leaving to set up home with their partner, are just as likely as women from privileged backgrounds to have achieved residential independence at the age of 25.

3.5. Leaving Home at a Young Age Increases with Distance from Universities and Strained Property Markets

The influence of the size of the parental home's Urban Unit on the decision to leave home at a young age may be attributed to composition effects (the individuals making up each of the areas have different characteristics) or to contextual effects (specific properties of the local environment). Highlighting the importance of each of these dimensions is complicated by the host of factors liable to have a bearing on mobility decisions and their potential interaction.

9. A working class (or disadvantaged) background is defined as having parents whose socio-professional category is manual worker, clerical worker or non-working, as opposed to a privileged background, where the parents belong to management or middle-level occupations.

Figure IV – **Distribution of reasons for first leaving by age at time of leaving, social background and parental home location by municipality type**



Reading Note: At the age of 25, 80% of young men from a privileged background in a rural municipality left their parental home for the first time in order to study, 6% left for work purposes, 3% to seek independence and 3% to set up home with a partner.
Sources and Coverage: DREES-Insee, *Enquête nationale sur les ressources des jeunes 2014* (ENRJ); 2,619 young men and 2,331 young women aged 18-24 in 2014 (14,156 young men-years and 12,242 young women-years).

In order to evaluate the effect of individual variables and contextual variables on regional disparity in leaving home at a young age, modelling is done of the first time young people leave home by applying a discrete-time model with competing risks. With this type of model, it is possible to control for the effect of right-censoring associated with the use of data from a retrospective survey: on the date of the survey, some of the young adults aged 18-24 have not yet left their parental home. It also means consideration can be given to the development in the individuals' situations over time, through a change of modality for certain variables.

The model's dependent variable differentiates between two types of home-leaving, based on mobility distance: less than 50 km from the parental home or 50 km and over. The reference category is young adults who have never left their parental home. Compared with an approach that might regard the three modalities as ordered, the modelling avoids the equal slope or "proportional odds" assumption (which is not met).

Discrete-time modelling is justified by the recording of the event of interest (first time the young adult left home) over a relatively long unit of time (year of age). So, a large number of young adults leave the parental home in the course of a single age interval, which is liable to lead to bias in a continuous-time estimation context (Cox, 1972; Yamaguchi, 1991). We assume that the process of leaving home starts at the age of 15 and comes to an end when a young person leaves the parental home for the first time. An observation is censored if the person was living with his/her parents in 2014, the last year of observation. The parameters estimated by the models have been corrected for the grouping together of person-year observations for the same young adult.

We study the factors that might explain the link between the Urban Unit size category to which the parental home municipality belongs and the probability of leaving home at a young age. Three versions of the model are estimated, each including additional explanatory variables compared with the previous one, with young adults from each type of region notably having different individual and family characteristics.[10]

Starting with an empty model, including only the Urban Unit size category for the parental home and the time period (Model 1), variables are gradually introduced at the individual level and relative to the young adult's socio-economic and family background (Model 2), followed by the introduction of three contextual variables characterising the parental home municipality, which might have a direct or indirect effect on the young adult leaving home for the first time (Model 3). We thus examine the effect of the gradual introduction of groups of explanatory variables in the competing risks model on the odds ratios estimated in the empty model. The results obtained with each of the models are shown in Figure V. Details of the variables included in each model (1, 2 and 3) are given in the Box.

10. The descriptive statistics for the population as a whole, by location and dependent variable values, are shown in the Online Appendices, Tables C1-1 and C2-1. Link to the Online Appendices at the end of the article.

Box – **Specifications for Discrete-Time Models with Competing Risks**

The first version of the model (Model 1) only includes as explanatory variables the main variable of interest (size category for the Urban Unit where the parental home is located) and the time period.

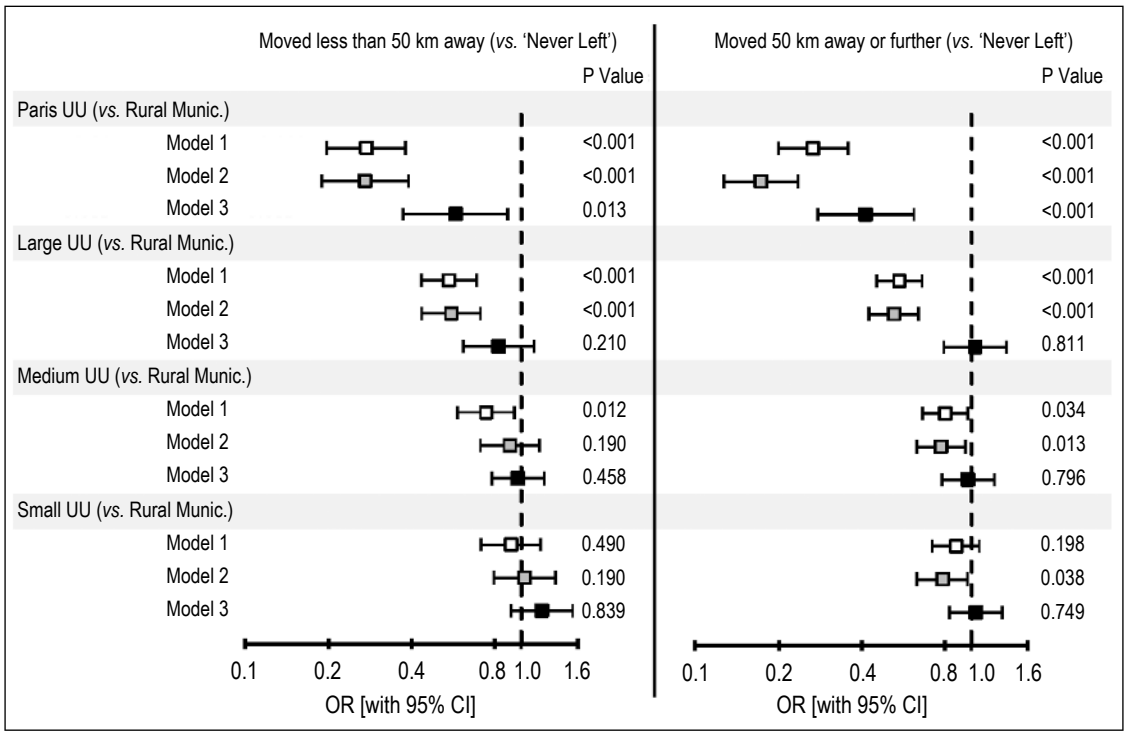
In Model 2, the additional variables relate, firstly, to the young adult's socio-economic and family background: the municipality where the parental home is located in the *département* where the young adult was born; their social background (measured by the combined socio-professional category of the young adult's parents); parental income (quartile of the parents' total personal income); the parents' highest qualification level (less than vocational qualification; vocational qualification; Baccalauréat; 2 years or more of higher education); parents' housing occupancy status (homeowners); the young adult's number of siblings, and an independent time-based variable in regard to experience of parental separation or the death of a parent. Secondly, variables relating to the young adult's personal characteristics are incorporated. In this case, with the exception of the young adult's gender, preference has been given to time-dependent characteristics to limit endogeneity issues due to the effect leaving home on the explanatory variables. These are the education and employment status, experience of a first stable romantic relationship, and qualification level (Baccalauréat). The lack of detailed retrospective information about the young adult's income also meant it was not possible to take this information into consideration.

The third version of the model (Model 3) includes three variables characterising the region that is being left, which might have a direct or indirect influence on leaving home for the first time: the distance between the parental home and nearest university; the unemployment rate in the parental home municipality; and a variable characterising the housing market situation in the parental home municipality. These three variables were selected in view of the results given in the literature, demonstrating that young adults' decisions about mobility and relocation are influenced more by local training and employment market characteristics than by the conveniences, comforts, natural charms and attractions offered by the regions (Détang-Dessendre *et al*., 2002). We therefore chose to incorporate two contextual variables into our model to get a grasp on the young adult's region of origin in terms of access to training and employment. The first is the distance between the parental home municipality and the nearest university. The location of higher education establishments in the different municipalities is derived from the French Ministry of Higher Education & Research data on the location of public institutes of higher education, freely available on the data.gouv.fr website. The second is the unemployment rate in 2014 for individuals aged 18-24 in the parental home municipality (calculated on the basis of annual censuses). However, the housing market certainly plays a role as regards the potential for young adults to leave home. We therefore add a continuous variable to capture the local situation, corresponding to →

Box *(contd.)*

the logarithmic transformation of the average price per m^2 for property sold in the parental home municipality between 2014 and 2018. This indicator is based on the DVF Real Estate Transaction data files, available on the data.gouv.fr website, containing information at municipal level on all property sales made over a five-year period. For each municipality, the average property price per m^2 was calculated by comparing the total property value of apartments and/or houses sold between 2014 and 2018 with the aggregate value of their built area. For greater consistency, we excluded from this calculation any real estate property including business, commercial or industrial premises or similar, and any for which the price per m^2 logarithm was 1.5 times higher or lower than the interquartile range for the price per m^2 for property of the same type (apartment or house) in the same municipality. In addition, the average price per m^2 logarithm was not calculated for municipalities where the number of properties sold was less than 5, nor for any municipalities in the *départements* of Bas-Rhin, Haut-Rhin and Moselle, for which DVF data are unavailable. These exclusions apply to 7.5% of young adults in our sample. Other variables were considered at a municipal level or by employment sector (adult unemployment rates, proportion of NEET aged 18-24, percentage of young adults living in the municipality where they were born, and percentage of young adults aged 18-24 living with a partner) but the results were inconclusive. The same applied as regards type of training available, distinguishing between areas within the different local education authorities based on the training and courses available there, as compiled by Fabre & Pawlowski (2019).

Figure V – **Link between parental home municipality type and probability of leaving parental home**



Notes: The estimated relative odds ratios are shown here with a 95% confidence interval for parental home location according to the different models (1, 2 and 3).
Reading Note: In the empty model (Model 1), the probability of a young adult from the Paris Urban Unit leaving home for the first time to move a distance of 50 km or more compared with staying with their parents is 0.27 times that of a young adult of the same age from a rural municipality. This ratio changes to 0.17 once the effects of the socio-demographic and family composition differences between young adults from different areas are controlled (Model 2). Lastly, after introducing contextual variables as regards the property market situation and distance from university (and youth unemployment rate) for the municipality that is being left, this same ratio remains significant but is now no more than 0.41.
Sources and Coverage: DREES-Insee, *Enquête nationale sur les ressources des jeunes 2014* (ENRJ), 4,950 young adults living with their parents or who first left the parental home at the age of 15 or over.

Model 1 confirms that there is a statistically significant link between the size of Urban Unit to which the parental home belongs and the probability of leaving it at a young age: the probability of leaving home before the age of 25 is greater the smaller the size of Urban Unit of origin. This link is similar for moves over a short distance (less than 50 km) and longer distances (50 km and over). The probability of young adults from the Urban Unit of Paris moving to independent accommodation less than 50 km or 50 km or more away from their parental home is over 70% less than for young adults from rural municipalities. The introduction of observable individual and family characteristics into the model (Model 2) makes little change

to these results.[11] However, once the effects of over-representation of students and young adults from privileged backgrounds in the Paris Urban Unit have been controlled, the differences related to the type of municipality increase for moves away from home involving a longer distance. So, after introducing the control variables, the probability of young adults from the Greater Paris Area moving 50 km or more away from their parental home is nearly 85% less than for young adults from rural municipalities.

Lastly, the variables introduced in Model 3 provide information about the influence of parental home municipality type on the probability of leaving home at a young age.[12] Local difficulties in access to the labour market, measured here by the unemployment rate for young adults aged 18-24 in the parental home municipality, do not seem to be linked to leaving home for the first time at a young age. Being a long distance away from a university, on the other hand, is associated with getting independent accommodation 50 km or more away from the parental home, but there is no link with mobility involving a shorter distance. The probability of moving 50 km or more away from the parental home (compared with the probability of never having left home) increases the greater the distance between a university and the municipality of origin. Short-distance mobility seems to be linked more to strain on the local property market. So, the probability of a young adult getting independent accommodation for the first time somewhere less than 50 km away from the parental home (compared with the probability of never having left home) is higher the less strain there is on the property market[13] in the municipality they are leaving.

Finally, the introduction of contextual variables (Model 3) noticeably mitigates differences in long-distance mobility and, to a lesser extent, short-distance mobility, between young adults from large Urban Units, medium-sized Urban Units, small Urban Units and rural municipalities (Figure V). However, there are still significant differences in mobility between young adults from these four types of area and those from the Greater Paris Area. This continued disparity may reflect imperfect consideration of journey time or distance to more selective training courses in the variables considered in the final model.

4. Regional Differences in Demands on Parents

While parental support for the transition to adulthood may take several forms, young adults' access to personal accommodation can, however, entail a particularly significant burden. Regional disparities in achieving residential independence are thus accompanied by differences in demands made on parents depending on their region of residence.

4.1. Parental Support when Leaving Home for the First Time

Nearly eight out of ten parents have provided at least one form of support when the young adults moved into personal accommodation for the first time, whether this involved helping to pay the rent, making alterations to the accommodation or helping to find it.[14] Parents almost systematically provide support for young adults leaving home for the first time to pursue studies, especially financial support (80% have helped to pay the rent, compared with 20% of parents of other independent young adults). Geographical distance makes little difference to the general pattern of parental support, other than for making alterations to the first accommodation when the young adult leaves home for a reason other than to study. Similarly, the region of origin has little effect on the forms of parental support given to young adults when moving into independent accommodation for the first time. However, a higher proportion of parents living in rural areas support young adults leaving home to move in with a partner: 70% have provided at least one form of support, compared with less than a third of parents from large urban areas.

However, regional disparities in achieving residential independence at a young age are reflected in considerable differences in the proportion of parents within each Urban Unit who are called on to support the young adult in getting settled. Fewer than 30% of parents living in the Greater Paris Area and about half of those in other large urban areas have provided at least one form of support for the young adult to achieve residential independence, compared with nearly 70% of parents from rural municipalities and 65% of those living in small

11. The effect of these characteristics does not constitute the principal subject of this work and the related coefficients are therefore not detailed here but are available from the authors. We note, however, that females, young adults who have already had a stable romantic relationship, and students who have already had their first experience of work, leave home sooner, while young adults from disadvantaged backgrounds leave the parental home later. In addition, the probability of leaving home for the first time to somewhere within 50 km of the parental home is higher for young adults with many siblings, those who have experienced their parents' separation or the death of a parent, and those working in a stable job.

12. The coefficients are available in the Online Appendix C3-1.

13. That is to say, a municipality where the average price per m^2 logarithm for property sold between 2014 and 2018 is low.

14. More than half, two thirds, and over half of parents, respectively.

or medium-sized urban areas. Looking just at contributing towards the rent, this concerns fewer than 20% of parents in the Greater Paris Area, 30% of those living in another large urban area, and over 40% of parents living in a rural municipality or small or medium-sized urban area. These differences in parental contribution by type of place of residence are greatest for parents of young people still near the age of majority (18-19) and become less marked as the age of the young adult increases. These differences in parental contribution rate by type of place of residence remain the same regardless of social background.

These spatial disparities in parental contribution may reflect lasting differences in covering costs during the school-to-work transition period, with a corresponding increase in the cumulative differences in parental assistance. Firstly, the proportion of young adults receiving parental support is higher the younger they are when they first leave home.[15] This support is then destined to continue for as long as their studies last. So, the earlier age at which young adults from rural municipalities and small urban areas leave home is likely to mean not just a higher incidence of parental support but also longer-lasting support.

4.2. A Greater Demand Made on Parents Living in Rural Municipalities for Financial Support

During the first two years of higher education, nearly 40% of parents living in rural municipalities or small or medium-sized urban areas cover the cost of the young adult's rent, a proportion that is over four times higher than for parents in the Ile-de-France region and about twice as high as for parents from other large urban areas[16] (Table 2). For young adults on undergraduate courses (two years of higher education), the proportion of parents who have supported the young adult in one way or another to move into independent accommodation for the first time (42%) is eight times higher among parents living in a rural municipality than among parents living in the Urban Unit of Paris (5%), and over twice as high as among parents living in a large town or city with a population of over 200,000 (16%). Providing financial support to young adults to move into accommodation after they have finished their education is also a more common occurrence among parents living in a small urban area or rural municipality: 16% of young adults in work and 5% of young adults who are unemployed or non-working whose parents live in a rural area have received this type of support, compared with less than 2% of young adults from the Paris Urban Unit who have finished their education.

Acting as guarantor for accommodation and paying the deposit are two other burdens commonly borne by parents living outside urban areas. Each of these burdens concerns about 20% of parents living in a rural municipality, compared with less than 10% of parents living in a large urban area (40% and 15% respectively in the specific case of young adults pursuing their studies). Lastly, in 2014, nearly a quarter of parents living in a rural municipality were also called upon to contribute towards other expenses associated with moving into accommodation (agency fees, moving expenses or furniture and furnishings), with this contribution amounting to around €1,000 on average. For young adults pursuing their studies, this amount is slightly lower (€900), but about €150 higher than the amount provided by parents living in the Paris Urban Unit.

4.3. Among Young Adults Given Support, Amounts Received Show Little Sensitivity to Parental Home Location

Spatial disparities in leaving home at a young age, combined with the greater financial burden for parents when the young adult no longer lives with them,[17] might suggest considerable differences in the amount of support received by young adults depending on parental home location. Now the overall amount of support received by young adults getting regular payments from their parents (whether or not they live with them) does not vary much by parental municipality type. These young adults receive, on average, about €3,900 a year, regardless of their parents' place of residence. However, this amount represents a slightly higher proportion of the income of parents living in a rural municipality or in a small or medium-sized urban area (10% compared with 8% for others).

This situation can be explained in part by structural differences: pursuing studies, which sees the highest levels of parental support, is more common for young adults from urban areas. So, out of the young students receiving support, with

15. A financial contribution towards housing costs concerns 2/3 of young adults who left the parental home at the age of 18-19, compared with about 20% of those who left at the age of 22-24 (80% and 50%, respectively, for young adults who left home to pursue studies).
16. Note that the average rent for independent young adults is higher (by around €100 a month) for those from the Urban Unit of Paris rather than rural municipalities. However, the data do not allow precise calculation of the budget parents allocate to paying towards their young adult's rent.
17. See, in particular, Grobon (2018) on use of ENRJ data.

Table 2 – **Proportion of parents providing support to a young adult to move to or remain in independent accommodation, by type of support**

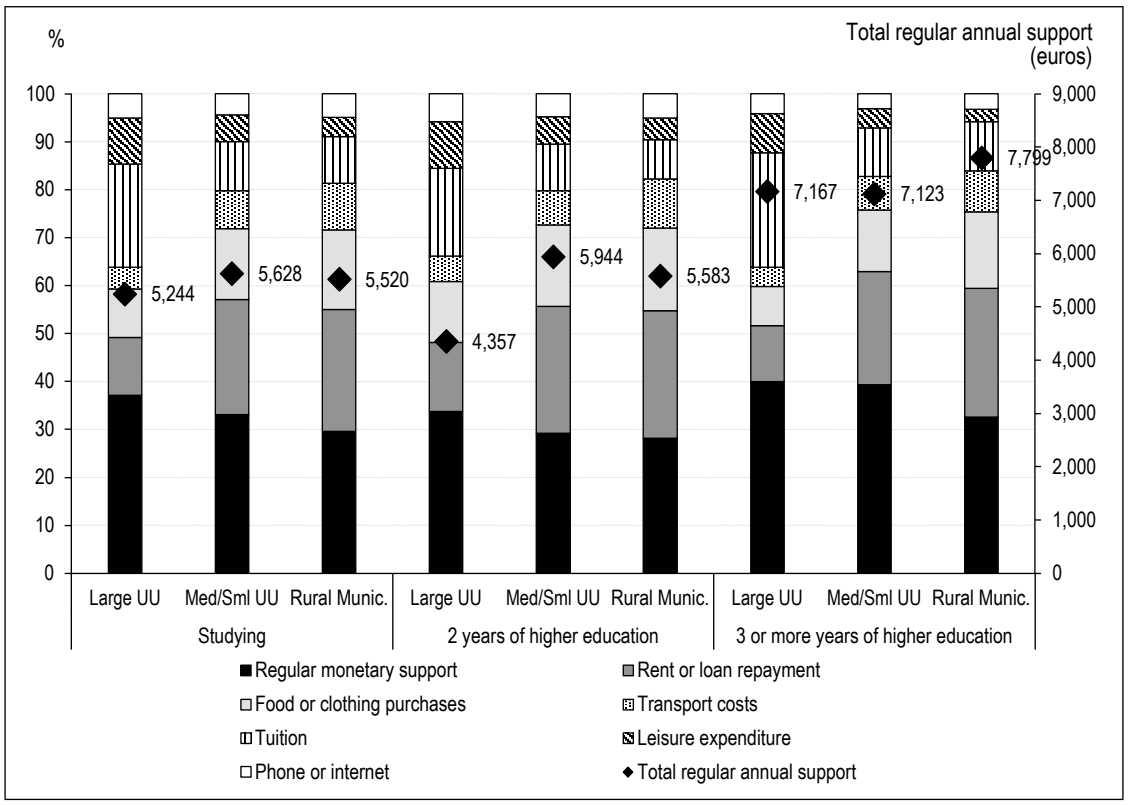
	Parental Home Municipality Type				
	Paris UU	Large UU	Medium / Small UU	Rural Munic.	Overall
Partial or total payment of rent for a young adult (average amount of rent in € for a young adult living independently)					
Overall	6.4 (553)	10.5 (493)	16.0 (443)	16.5 (446)	13.2 (450)
Studying	10.1 (552)	17.9 (493)	32.1 (435)	35.5 (427)	24.9 (449)
2 years of higher education	7.9 (527)	19.6 (450)	36.9 (425)	40.9 (405)	28.5 (424)
3+ years of higher education	13.4 (606)	24.2 (507)	40.5 (475)	44.9 (491)	30.3 (496)
Working	0.0	0.8	0.4	1.0	0.6
Unemployed or non-working	0.9	4.1	1.7	1.3	2.1
Payment of deposit on accommodation for a young adult					
Overall	4.7	13.1	19.6	20.4	15.8
Studying	7.5	20.5	35.0	37.4	26.4
2 years of higher education	7.1	19.8	39.7	44.0	30.1
3+ years of higher education	9.5	28.6	47.2	54.4	34.2
Working	0.0	4.2	6.2	7.0	5.2
Unemployed or non-working	0.9	4.1	6.0	5.6	4.5
Acting as guarantor on accommodation for a young adult					
Overall	3.8	13.2	20.7	21.1	16.2
Studying	5.9	20.3	34.1	36.6	25.6
2 years of higher education	3.3	18.4	36.9	42.6	27.7
3+ years of higher education	8.9	29.1	48.5	54.9	34.7
Working	0.2	7.1	10.1	10.8	8.3
Unemployed or non-working	0.9	4.0	5.9	4.2	4.5
Financial support given to a young adult to move into accommodation (average amount of support in €)					
Overall	4.8 (1,007)	13.5 (1,130)	20.9 (971)	23.4 (1,107)	17.0 (1,044)
Studying	7.2 (732)	19.4 (1,000)	35.6 (919)	37.6 (900)	26.3 (919)
2 years of higher education	5.0 (670)	15.9 (816)	40.2 (853)	42.0 (768)	28.6 (815)
3+ years of higher education	10.7 (732)	29.6 (1,130)	48.1 (988)	55.3 (1,045)	35.3 (1,013)
Working	0.6	7.4	9.1	15.5	9.4
Unemployed or non-working	1.5	7.1	4.6	5.2	5.0

Reading Note: In 2014, 6.4% of parents from the Paris Urban Unit pay all or part of their young adult's rent. The average cost of rent for young adults from the Ile-de-France area living independently is €553. In addition, 4.8% of parents have provided financial support to help their young adult get settled in independent accommodation, support amounting to €1,007 on average.
Sources and Coverage: DREES-Insee, *Enquête nationale sur les ressources des jeunes 2014* (ENRJ); 4,950 parents of young people aged 18-24 in 2014.

independent accommodation at the time of the survey, the average annual total given by parents is in the order of €9,500 for those from a large urban area, compared with less than €8,000 for others (i.e. 12% and 14%, respectively, of parental income). Given the same position as regards studying and work, young adults from a rural municipality and, to a lesser extent, those from a small or medium-sized urban area, receive slightly higher total levels of support annually, representing markedly higher burden-to-income ratios for their parents. Looking at young adults in their second year of a masters degree or studying for a doctorate degree or Grande École, those who come from a large urban area receive a level of support equivalent to 10% of their parents' income, compared with 14% for young adults from a small or medium-sized urban area and 16% for those who come from a rural municipality.

Besides any differences related to the rent, the scale of support given by parents from large Urban Units can be explained by their coverage of other expenses (Figure VI). So, the annual total received by young students from an urban area in order to pay tuition fees (€1,130) represents virtually twice that received by young adults coming from other areas. These differences are evident regardless of the level of tertiary educational course being followed by the young adult. The differences are also more evident for young adults with independent accommodation at the time of the survey, probably because those from an urban area with independent accommodation are the ones on the most expensive courses.

Figure VI – **Breakdown of annual amount paid by parents who regularly support the young adult, by level of education**



Reading Note: Parents who regularly support a young adult living in the Paris Urban Unit or other large Urban Unit pay them an average of €5,244 a year. Regular monetary support that is not pre-allocated for specific purposes represents 37% of this total amount.
Sources and Coverage: DREES-Insee, *Enquête nationale sur les ressources des jeunes 2014* (ENRJ); 4,950 young adults aged 18-24 in 2014.

* *
*

This study of young people leaving the parental home in the first years of adulthood reveals significant disparities by region of origin. Occurring mostly in order to pursue studies, leaving home happens at a much younger age outside large urban areas, with more pronounced parental involvement. The marked differences notably reflect the concentration of higher education establishments in large urban areas, unlike the situation in other European countries with a more dispersed network of universities.

The spatial dimension appears to be a determining principle in the social differentiation in the timing and forms of leaving home. So, the persistence of a "traditional" model for entering adulthood typified by setting up home with a partner at a young age mainly concerns young women with working class backgrounds from rural areas. The model of early empowerment related to pursuing studies mainly applies to young adults from privileged backgrounds, whose parents live in a rural municipality or in a small or medium-sized urban area. It is associated with a greater distance between the young adult's accommodation and the parental home.

These spatial disparities in achieving residential independence at a young age are associated with a higher proportion of parents in rural municipalities or small urban areas being called upon for support, especially financial support. While there is little variation in the average amount of support given according to parental area of residence, it nevertheless equates to a significantly higher burden-to-income ratio for parents living outside large Urban Units, in particular for young adults still studying. Secondly, parents living in large urban areas direct their support more at paying for tuition and leisure activities than for accommodation.

This descriptive comprehensive overview sheds light on significant spatial disparities in achieving residential independence at a young age in France. Use of a more restrictive definition of residential independence does not fundamentally change the results (see Online Appendix, Figure C4-I). A more extensive analysis of the role of parental support for young people leaving home encounters the obstacle of a lack of information on the level of support that might have been received by those who have not left

home. Moreover, it is only possible to get an imperfect grasp of the cumulative dimension of parental support throughout the period of transition to adulthood. Lastly, it would be worthwhile carrying out more in-depth analysis of spatial disparities down to a finer geographic level. Biographic data retracing all of the young adult's changes of residence and the associated parental support for each move would allow a better understanding of the way in which the spatial dimension structures the paths taken by young people towards residential independence. □

Link to Online Appendix: https://www.insee.fr/en/statistiques/fichier/5347216/ES-522-523_Kersuzan-Solignac_Online_Appendices.pdf

BIBLIOGRAPHY

Alpe, Y. (2018). Des « effets de territoire » sur les trajectoires scolaires des élèves ruraux ? Un bilan de 20 ans de recherches. *In* : Cayouette-Remblière, J., Jedlicki, F. & Moulin, L. (Dir.). *Comment se fabriquent des offres scolaires inégales ?* Ined, *Document de travail* N° 241, pp. 82–95. https://www.ined.fr/fr/publications/editions/document-travail/comment-se-fabrique-des-offres-scolaires-inegales/

Amsellem-Mainguy, Y. (2016). L'accès à l'âge adulte pour les jeunes en France. *Informations sociales*, 195(4), 9–13. https://doi.org/10.3917/inso.195.0009

Arrighi, J.-J. (2004). Les jeunes dans l'espace rural : une entrée précoce sur le marché du travail ou une migration probable. *Formation Emploi,* 87, 63–78. https://doi.org/10.3406/forem.2004.1671

Baccaïni, B. (2001). Les migrations internes en France de 1990 à 1999 : l'appel de l'Ouest. *Économie et Statistique*, 344, 39–79. https://doi.org/10.3406/estat.2001.7450

Baccaïni, B. (2007). Les flux migratoires interrégionaux en France depuis cinquante ans. *Population*, 62(1), 143–160. https://doi.org/10.3917/popu.701.0143

Baccaïni, B. (2009). Recensement de la population de 2006. Les migrations entre départements : le Sud et l'Ouest toujours très attractifs. *Insee Première* N°1248. https://www.epsilon.insee.fr/jspui/bitstream/1/695/1/ip1248.pdf

Behrens, K., Tano, S. & Robert-Nicoud, F. (2015). Agglomeration Theory with Heterogenous Agents. *In*: Duranton, G., Henderson, J. V. & Strange, W. C. (Ed.), *Handbook of Regional and Urban Economics*, 5(1), 172–245.UK: Elsevier. https://doi.org/10.1016/B978-0-444-59517-1.00004-0.

Bellidenty, J. (2018). Études, travail, logement : comment les enfants de parents séparés entrent dans l'âge adulte ? *Études et résultats* N° 1071. https://drees.solidarites-sante.gouv.fr/IMG/pdf/er1071.pdf.

Berck, P., Tano, S. & Westerlund, O. (2016). Regional Sorting of Human Capital: The choice of Location among Young Adults in Sweden. *Regional Studies*, 50(5), 757–770. https://doi.org/10.1080/00343404.2014.931935

Bergouignan, C. (2009). L'impact des migrations sur les compositions par âge des populations locales : typologie cantonale pour une analyse rétrospective et prospective. *Espace populations sociétés*, (1), 45–65. https://doi.org/10.4000/eps.3580

Bloss, T. (2008). Première mise en couple et temporalités biographiques de classe. *In* : Cavalli, A., Cicchelli, V. & Galland, O. (Ed.), *Deux pays, deux jeunesses ? La condition juvénile en France et en Italie*, 61–69. Rennes : Presses universitaires de Rennes.

Bouquet, B. (2018). Place des jeunes dans les territoires ruraux : avis du Cese, 2017. *Vie sociale*, 22(2), 157–162. https://doi.org/10.3917/vsoc.182.0157

Bosquet, C. & Overman, H. (2019). Why does birthplace matter so much? *Journal of Urban Economics*, 110(C), 26–34. https://doi.org/10.1016/j.jue.2019.01.003

Bozon, M. & Villeneuve-Gokalp, C. (1995). L'art et la manière de quitter ses parents. *Population et Sociétés* N° 297. https://www.ined.fr/fichier/s_rubrique/18713/pop_et_soc_francais_297.fr.pdf

Castell, L., Rivalin, R. & Thouilleux, C. (2016). L'accès à l'autonomie résidentielle pour les 18-24 ans : un processus socialement différencié. *In* : Insee, *France Portrait Social*, 11–25. https://www.insee.fr/fr/statistiques/2503441?sommaire=2492313

Cavalli, A., Cicchelli, V. & Galland, O. (2008). Deux variantes d'un même modèle. *In* : Cavalli, A. & Cicchelli, V. & Galland, O. (Ed.), *Deux pays, deux jeunesses ? La condition juvénile en France et en Italie*, 255–262. Rennes : Presses universitaires de Rennes.

Cereq (2011). La course d'orientation des jeunes ruraux. *Bref du Céreq* N° 292. https://www.cereq.fr/la-course-dorientation-des-jeunes-ruraux

Chevalier, T. (2018). *La jeunesse dans tous ses États. Paris :* PUF.

Cichelli, V. (2013). *L'autonomie des jeunes. Questions politiques et sociologiques sur les mondes étudiants*. Paris : La Documentation Française.

Combes, P.-P. & Gobillon, L. (2015). The Empirics of Agglomeration Economies. *In*: Duranton, G., Henderson, J. V. & Strange, W. C. (ed.), *Handbook of Regional and Urban Economics*, 5(1), 247–348. UK:Elsevier. https://doi.org/10.1016/B978-0-444-59517-1.00004-0.

Coquart, B. (2015). *Que sait-on des jeunes ruraux ? Revue de littérature.* Rapport d'études pour l'Institut national de la jeunesse et de l'éducation populaire. https://injep.fr/wp-content/uploads/2018/09/rapport-2015-03.pdf

Couet, C. (2006). La mobilité résidentielle des jeunes. *In*: *Données Sociales – La société française*, 495–504, Paris : Insee.

Cox, D.R. (1972). Regression models and life-tables. *Journal of the Royal Statistical Society*, Series B (Methodological), 34(2), 187–220. https://doi.org/10.1111/j.2517-6161.1972.tb00899.x

Déchaux, J. (2007). L'entraide familiale au long de la vie: Des pratiques inégalement réparties. *Informations sociales*, 137 (1), 20–30. https://doi.org/10.3917/inso.137.0020

Delance, P. & Vignolles, B. (2017). Ça déménage ? La mobilité résidentielle et ses déterminants. *Insee Références – Les conditions de logement en France*, 55–77. https://www.insee.fr/fr/statistiques/2586010?sommaire=2586377

Despalins, R. & de Saint Pol, T. (2012). L'entrée dans la vie adulte des bacheliers sous l'angle du logement. *Études et résultats,* N° 813. https://drees.solidarites-sante.gouv.fr/IMG/pdf/er813.pdf

Détang-Dessendre, C., Piguet, V. & Schmitt, B. (2002). Les déterminants micro-économiques des migrations urbain-rural : leur variabilité en fonction de la position dans le cycle de vie. *Population*, 57(1), 35–62. https://doi.org/10.2307/1534785

Détang-Dessendre, C., Goffette-Nagot, F & Piguet, V. (2008). Life Cycle and Migration to Urban and Rural Areas: Estimation of a Mixed Logit Model on French Data. *Journal of Regional Science*, 48(4), 789–824. http://dx.doi.org/10.1111/j.1467-9787.2008.00571.x

Détang-Dessendre, C. & Piguet, V. (2017). Graduates and Migration in France: Between Urban Labour-Market Attraction and Interest in Amenities. *In*: Corcoran, J. & Faggian, A. (Eds.), *Graduate migration and regional development: an international perspective,* 139–158. UK/USA: Edward Elgar Publishing.

Diamond, J. (2016). The Determinants and Welfare Implications of US Workers diverging Location Choices by Skill: 1980-2000. *American Economic Review*, 106(3), 479–524. https://doi.org/10.1257/aer.20131706

Dormont, B. & Dufour-Kippelen, S. (2000). Insertion professionnelle et autonomie résidentielle : le cas des jeunes peu diplômés. *Économie et Statistique*, 337-338, 97–120. https://doi.org/10.3406/estat.2000.7498

Dufour-Kippelen, S. (2001). Les déterminants des trajectoires de décohabitation et d'accès à l'emploi des jeunes peu diplômés. *Revue des politiques sociales et familiales*, 65, 73–89. https://doi.org/10.3406/caf.2001.966

Dumartin, S. (1995). Mobilité géographique et insertion professionnelle des jeunes. *Économie et Statistique*, 283-284, 97–110. https://doi.org/10.3406/estat.1995.5965

Eyémoud, J.B. & Wasmer E. (2016). *Vers une société de mobilité. Les jeunes, l'emploi et le logement*. Paris: Presses de Sciences Po.

Fabre, J. & Pawlowski, E. (2019). Aller étudier ailleurs après le baccalauréat : entre effets de la géographie et de l'offre de formation. *Insee Première* N° 1727. https://www.insee.fr/fr/statistiques/3688229

Fack, G. (2005). Pourquoi les ménages pauvres paient-ils des loyers de plus en plus élevés ? L'incidence des aides au logement en France (1973-2002). *Économie et Statistique*, 381-382, 17–40. https://doi.org/10.3406/estat.2005.7207

Galland, O. (2000). Entrer dans la vie adulte : des étapes toujours plus tardives, mais resserrées. *Économie et Statistique*, 337-338, 13–36. https://doi.org/10.3406/estat.2000.7494

Gambino, M. & Desmesure, O. (2014). Habiter les espaces ruraux : les enjeux des formes de mobilité des jeunes. Regards interdisciplinaires. *Norois*, 233(4), 25–35. https://doi.org/10.4000/norois.5401

Gaviria, S. (2005). *Quitter ses parents. Devenir adulte en Espagne et en France, un processus divergent*. Rennes : Presses Universitaires de Rennes.

Gobillon, L. (2001). Emploi, Logement et Mobilité Résidentielle. *Économie et Statistique*, 349-350, 77–98. https://doi.org/10.3406/estat.2001.7415

Grobon, S. (2018). Combien coûte un jeune adulte à ses parents? *Insee Références- Les revenus et le patrimoine des ménages,* 65–79. https://www.insee.fr/fr/statistiques/3559099?sommaire=3549502

Herpin, N. & Déchaux, J.-H. (2004). Entraide familiale, indépendance économique et sociabilité. *Économie et Statistique*, 373, 3–32. https://doi.org/10.3406/estat.2004.7256

Herpin, N. & Verger, D. (1997). Les étudiants, les autres jeunes, leur famille et la pauvreté. *Économie et Statistique*, *308-309-310*, 221–227. https://doi.org/10.3406/estat.1998.2599

Holdsworth, C. (2004). Family Support During the Transition Out of the Parental Home in Britain, Spain and Norway. *Sociology*, *38*(5), 909–926. https://doi.org/10.1177/0038038504047179

Laferrère, A. (2005). Quitter le nid : entre forces centripètes et centrifuges. *Économie et Statistique*, *381-382*, 147–175. https://doi.org/10.3406/estat.2005.7212

Laferrère, A. & Le Blanc, D. (2004). Gone with the Windfall: How do Housing Allowance Affect Student co-Residence? *CESifo Economic Studies*, 50(3), 451–477. https://doi.org/10.1093/cesifo/50.3.451

Lemistre, P. & Magrini, M. (2010). Mobilité géographique des jeunes : du système éducatif à l'emploi. Une approche coûts/bénéfices des distances parcourues. *Formation Emploi*, 110(2), 63–78. https://doi.org/10.4000/formationemploi.3051

Magord, C. (2016). Du RMI jeunes à la Garantie jeunes : les débats sur le soutien à l'autonomie des jeunes adultes. *Informations sociales*, 195(4), 66–75. https://doi.org/10.3917/inso.195.0066

Majamaa, K. (2013). The effect of socio-economic factors on parental financial support from the perspectives of the givers and the receivers. *European Societies*, *15,* 57–81. https://doi.org/10.1080/14616696.2012.721891

Margirier, G. (2004). Quelles mobilités géographiques en début de vie active ? *Formation Emploi, 87*, 15–27. https://doi.org/10.3406/forem.2004.1668

Maunaye, E. (2016). L'accès au logement autonome pour les jeunes, un chemin semé d'embûches. *Informations sociales*, 195(4), 39–47. https://doi.org/10.3917/inso.195.0039

Menard, A. R. & Vergnat, V. (2020). Young People's Decisions in the Transition to Adulthood in France: The Influence of Family Factors. *Economie et Statistique / Economics and Statistics*, 514-515-516, 93–111. https://doi.org/10.24187/ecostat.2020.514t.2011

Mora, V., Sulzer, E., Goffette, C. & Joseph O. (2008). *Insertion professionnelle et autonomie résidentielle des jeunes*. Observatoire National de la Pauvreté et de l'Exclusion Sociale (Ed.). Paris : La Documentation française. https://onpes.gouv.fr/IMG/pdf/Cereq3.pdf

Mulder, C. H. (2009). Leaving the Parental Home in Young Adulthood. *In:* A. Furlong (Ed.), *Handbook of youth and young adulthood: New perspectives and agendas*, 203–210. London: Routledge.

Orange, S. & Renard, F. (2018). *Au bonheur des dames. Attachement local et relations d'obligations dans l'accès à l'âge adulte des jeunes femmes d'origine populaire et rurale.* Rapport final post-enquête RURELLES, Insee/DREES. https://drees.solidarites-sante.gouv.fr/IMG/pdf/acces_age_adulte_femmes_cens_gresco.pdf

Portela, M. & Dezenaire, F. (2014). Quitter le foyer familial : les jeunes adultes confrontés à la crise économique. *Études et résultats* N° 887. https://drees.solidarites-sante.gouv.fr/IMG/pdf/er887.pdf

Regnier-Loilier, A. (2006). À quelle fréquence voit-on ses parents ? *Population & Sociétés* N° 427. https://www.ined.fr/fichier/s_rubrique/19095/pop_et_soc_francais_427.fr.pdf

Renahy, N. (2005). *Les gars du coin. Enquête sur une jeunesse rurale*. Paris: La Découverte.

Roback, J. (1982). Wages, Rents, and the Quality of Life. *Journal of Political Economy*, 90(6), 1257–1278. https://doi.org/10.1086/261120

Robette, N. (2020). The Life Courses of Young Adults in France: Changes in Social and Gender Differentiation over the Long Period. *Economie et Statistique / Economics and Statistics*, 514-515-516, 9–28. https://doi.org/10.24187/ecostat.2020.514t.2006

Robert-Bobée, I. (2002). Parmi les jeunes ne vivant plus chez leurs parents, les étudiants sont les plus aidés par leur famille. *Insee Première* N° 826. https://www.epsilon.insee.fr/jspui/bitstream/1/464/1/ip826.pdf

Rosen, S. (1974). Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition. *Journal of Political Economy*, 82(1), 34–55. https://doi.org/10.1086/260169

Sjaastad, L. A. (1962). The Costs and Returns of Human Migration. *Journal of Political Economy*, 70(5), 80–93. https://doi.org/10.1086/258726

Solard, J. & Coppoletta, R. (2014). La décohabitation, privilège des jeunes qui réussissent ? *Économie et Statistique, 469-470*, 61–84. https://doi.org/10.3406/estat.2014.10424

Thissen, F., Fortuijn, J. D., Strijker, D. & Haarsten, D., 2010. Migration intentions of rural youth in the westhoek, flanders, Belgium and the Veenkoloniën, The Netherlands. *Journal of Rural Studies*, 26(4), 428–436. https://doi.org/10.1016/j.jrurstud.2010.05.001

Van de Velde, C. (2008). *Devenir adulte. Sociologie comparée de la jeunesse en Europe*. Paris: Presses Universitaires de France.

Van de Velde, C. (2012). Soutenir l'autonomie des jeunes majeurs : puissance et impuissance du politique. *In*: V. Becquet (éd.), *Politiques de jeunesse : le grand malentendu*, pp. 53–64. Nîmes: Champ social. https://doi.org/10.3917/chaso.becqu.2012.01.0053

Van de Velde, C. (2014). Une génération « indignée »? Les jeunes face à la crise en Europe. *Cahiers de sociologie économique et culturelle*, (56), 13–31. https://www.researchgate.net/publication/342504057_Une_generation_indignee_Les_jeunes_face_a_la_crise_en_Europe

Vanoni, D. (2013). Comment la crise du logement fragilise depuis dix ans une société déjà déstabilisée. *Recherche sociale*, 207(3), 6–27. https://doi.org/10.3917/recsoc.207.0006

Villeneuve-Gokalp, C. (1997). Le départ de chez les parents : définitions d'un processus complexe. *Économie et Statistique*, 304-305, 149–162. https://doi.org/10.3406/estat.1997.2562

Yamaguchi, K. (1991). *Event History Analysis*. Californie: Sage Publications.

Social Inequalities and the Desynchronisation of Sleep Within Couples

Capucine Rauch*

Abstract – In the majority of couples, the partners synchronise their sleep; however, synchrony is not the same across all social classes: the sleep of white-collar and blue-collar couples is the most out of sync. Based on the Time Use Surveys conducted in 1986, 1999 and 2010, we are creating a sleep organisation typology for couples in order to study the factors behind desynchronisation and the ways in which they have changed between the mid-1980s and the late 2000s. Between these two dates, an increase in desynchronisation has been observed in almost all social classes due to an increase in the amount of time spent watching television. However, inequality with regard to working hours remains the principal factor behind the differences in sleep synchronisation. Sleep desynchronisation also reflects gender inequalities in the division of work between couples, with men and women undertaking different activities while their partner is sleeping.

JEL Classification: Z13, J16, J12
Keywords: sleep, time use, social inequalities, gender inequalities

**National Institute for Demographic Studies (Institut National d'Études Démographiques – INED), Sciences Po, CNRS (capucine.rauch@ined.fr)*
Special thanks to Laurent Lesnard and Jeanne Ganault, as well as Nicolas Robette. I would also like to thank the two anonymous reviewers whose comments and suggestions helped to improve this article.
Received in July 2019, accepted in May 2020. Translated from "Inégalités sociales et désynchronisation du sommeil au sein des couples"

Citation: Rauch, C. (2021). Social Inequalities and the Desynchronisation of Sleep Within Couples. *Economie et Statistique / Economics and Statistics*, 522-523, 81–104. https://doi.org/10.24187/ecostat.2021.522d.2040

Since the duration of a day is limited, individuals have to make choices between different activities, choices that depend largely on their preferences and time constraints. As a result, time use differs from one individual to the next. For example, those who are employed and in higher social classes tend to prioritise "active" activities (professional, sporting, club and cultural activities, for example) to the detriment of "passive" activities, such as sleep and television, activities that those who are less well-off or unemployed devote more time to (Degenne *et al.*, 2002). Men are also more likely to view sleep as an "unfortunate necessity" as it takes up time that could be used for other activities, such as work in particular (Degenne *et al.*, 2002; Meadows *et al.*, 2008).

These examples point to the fact that sleep does not have the same position among the preferences of individuals and in the way in which they organise their time. Just like their other activities, individuals organise their sleep. The phrase "to do sleep", which is used as a verb by certain English-speaking researchers, reflects the fact that sleep is not a state that is simply experienced, but a behaviour loaded with social significance (Taylor, 1993), which is shaped by individuals' bodily *habitus* and *hexis* (Williams, 2002). In *Les techniques du corps*, Mauss shows early awareness of this by highlighting that sleep is a cultural phenomenon that can be learned (Mauss, 1936) and that falling asleep is the result of a cultural process that is taught from childhood (Aubert & White, 1959a; 1959b). Within a community, sleep coordination is a condition that allows for the organisation of community living. Individuals sleep at the same time because they need one another when they are awake (Schwartz, 1970). Sleep and its social organisation are prerequisites for the functioning of a society (Williams, 2002), and public health issues, as highlighted in a recent report by the Terra Nova Foundation (Léger *et al.*, 2016). Sleep is therefore not only determined by biological necessities, but also follows norms and values and is a paradigmatic example of the interaction between biological and social processes (Williams, 2002).

Sleep is therefore an organised activity. Biddle & Hamermesh (1990) integrate sleep into an optimal time allocation model and conclude that it can be considered to be in competition with other activities of greater value. This would make it subject to consumer choice and it would be affected by the same economic variables as those that govern other time-based decisions. A qualitative study of employed students and shift workers in the United States also highlights the efforts made by these individuals to negotiate, manage and plan their sleep (Coveney, 2014).

In addition, Chatzitheochari & Arber (2009) provide evidence of inequalities among British workers with regard to the risk of having a low sleep duration, and they describe sleep as a further element that must be taken into account when striking a work-life balance. Furthermore, the latter is inseparable from the study of the division of work within couples and the associated gender inequalities. International comparisons show that the gender gap in sleep time is not consistent across societies.[1] A study based on the US time use survey highlights that, regardless of their position in the life cycle, American women sleep longer than men (Burgard & Ailshire, 2013), whereas in South Korea, the average woman spends less time sleeping than her male counterparts (Fisher & Robinson, 2010). For the most part, these differences can be explained by disparities in professional and family responsibilities, as well as in time use.[2] Sociocultural characteristics must therefore be taken into account when analysing sleep habits, as they are likely to have different effects on men and women (Cha & Eun, 2014). A European comparison (Maume *et al.*, 2018) also suggests that gender inequalities are linked to non-restorative sleep and that women and men sleep better on average in countries with greater gender equality. The duration and quality of sleep would therefore be unequal between men and women, which would contribute to reinforcing gender inequalities.

Nevertheless, aside from the small number of qualitative studies,[3] analyses linking time use and sleep inequalities between men and women are mainly carried out at the individual level. Ricroch (2012) presents an initial analysis of sleep synchronisation within couples on the basis of the French Time Use Survey (Insee), but applies a typology of nights (22:00-08:00) on an individual basis before combining the classes to which both partners belong. However, this level of analysis only partially captures the potential differences in the influence of family and professional responsibilities on

1. See, for example, Fisher & Robinson, 2010; Robinson & Michelson, 2010.
2. See in particular Cha & Eun, 2014; 2018; Hislop & Arber, 2003; Maume et al.*, 2018; Maume* et al.*, 2009; 2010; Venn* et al.*, 2008.*
3. In particular, Hislop & Arber, 2003; Maume et al.*, 2009; Venn* et al.*, 2008.*

men and women. Indeed, this reasoning makes implicit reference to gender inequalities within couples, but it does not allow them to be studied directly because men and women are analysed separately. Reasoning at the level of the couple allows the interactions between partners to be taken directly into account rather than reconstructing them *a posteriori*. In their conclusion, Maume *et al.* (2018) therefore highlight the need for quantitative research at the level of the couple in order to study the way in which professional and family obligations impact on the ability of partners to enjoy restorative sleep when they need it.

In addition, Méda (2001) notes that, with the traditional division of labour, in the case of couples where only the man is working, the woman plays the role of a "time reservoir", taking charge of coordinating the different social times. With the increase in the number of couples in which both partners work, this specialisation is disappearing. Within such couples, the synchronisation of the partners' time needs to take account of not one, but two professional constraints. Lesnard (2008) points out that the desynchronisation of working hours, a phenomenon that is strongly linked to social status, is affecting more and more couples in which both partners work, and that this lack of synchronisation is to the detriment of family time. Those who have the opportunity to do so more often than not opt for a standard and synchronised working day. So what is the situation when it comes to choosing sleep schedules? Although Ricroch (2012) notes that the more atypical the sleep schedules, the less likely they are to be shared by couples, she does not go further into this analysis.

Studying the organisation of sleep at the couple level therefore allows the associated inequalities to be studied at two levels: within couples by comparing the situation of the two partners, and between couples by studying the regular or atypical nature of the way in which they organise certain aspects of time in order to compare their respective situations. This is what we propose to do by studying sleep synchronisation within couples using the 1985-1986, 1998-1999 and 2009-2010 Time Use Surveys. The article is organised as follows: in the first section, we present the data used and the forms of sleep (de)synchronisation within couples. The second section describes the structuring and desynchronisation of sleep within couples and the third section explores the link between the desynchronisation of sleep and social inequalities.

1. Synchronisation and Desynchronisation of Sleep

1.1. Data and Measurement of Sleep Within Couples

1.1.1. Standardisation of the Time Use Surveys and Coverage

The three most recent French Time Use Surveys conducted by Insee (*Enquête Emploi du temps*, 1985-1986, 1998-1999 and 2009-2010) allow for a detailed analysis of the management of time by individuals and their partners in the case of couples. In fact, respondents are asked to fill in a diary, indicating in their own words all of the activities carried out during the day. By combining the partners' diaries, it is therefore possible to study the way in which couples organise their sleep.

In 1985-1986 and 1998-1999, individuals were only required to fill in one diary, whereas in 2009-2010, they filled in two, one on a weekday and the other on a weekend day (they only filled in one if they were included in a module on money arrangements within couples). This therefore brings about an over-representation of couples' days in the 2009-2010 survey, including the days of couples who are unemployed or in which the two partners are students, couples whose children are employed and living with their parents and couples formed less than a year previously.

In order to correct these skewed distributions, we assign a weighting of 2 to the couples who only filled in a single diary in 2009-2010 and then adjust the weighting of the couples' days from 1985-1986 and 1998-1999 in such a way that each survey is equally represented within the sample.

In 1985-1986, the activities were timed at 5 minute intervals; however, this increased to 10 minutes for the other two surveys. In all cases, the activities are recorded from midnight to midnight (the 2009-2010 survey also took account of activities performed the previous evening between 21:00 and midnight, which we are disregarding). Also, it should be borne in mind that, in the vast majority of cases, the sleep that we are observing relates to two separate nights, from midnight to the time that the person gets out of bed on the first night and then from the time that the person goes to bed to midnight on the second night, possibly with one or more naps in between (of the diaries completed during all three survey years by persons over the age of 15 residing in Metropolitan France, 12%

included one episode of sleep, 52% included two, 25% included three, 8% included four and 3% included at least five). In order to standardise the time use intervals, we duplicated each of the 144 10-minute slots from the 1998-1999 and 2009-2010 surveys in order to artificially obtain 288 5-minute slots.

We are only including cohabiting heterosexual couples where both partners completed a diary on the same day. Homosexual couples are not being taken into account as they only represent a very small part of the sample and we want to be able to study the possible impact of gender on the conjugal organisation of sleep. We are excluding couples who did not complete the individual questionnaire, for whom we do not have any socio-demographic information, as well as those who did not report any episodes of sleep. The final sample is made up of 19,076 couple days: 5,644 from 1985, 4,570 from 1998 and 8,862 from 2009.

1.1.2. Sleep in the Time Use Surveys

To allow the diaries to be compared, the activities described by the respondents are grouped under different options. However, the coding is not consistent across the surveys: sleep is broken down into four options in the 1985-1986 survey, three in the 2009-2010 survey and only one in the 1998-1999 survey. Furthermore, "in accordance with European recommendations, periods of rest (naps, for example) of under 3 hours are coded in the 2010 survey as 'doing nothing'. This activity was previously coded as 'sleep'." (Insee, 2017).

For the sake of consistency, for each survey, we consider the options corresponding to "doing nothing" or "relaxing" to be equivalent to sleep. As a result, the times referred to here as "sleep" do not reflect actual sleep, but the time allocated to sleep (or a similar activity). In addition, although very few individuals explicitly recorded it in their diaries, sleep can also include sexual activity (across all the survey years, only 1.6% of the diaries filled in by persons over the age of 15 residing in Metropolitan France contained at least one episode of "private activities", which is the option that includes sexual activity, among other things).

The following activities are included as sleep:

-1985-1986: nocturnal sleep (essential) including sleep during the day for those who work at night; daytime sleep (accidental, e.g. when a person is unwell); having a lie in, a nap or a rest; relaxing, thinking, making plans, doing nothing, no visible activity; smoking, whistling.

-1998-1999: sleeping; relaxing, reflecting; smoking.

-2009-2010: sleeping; bedridden, unwell; time around sleep (insomnia, lie ins, etc.); doing nothing, strolling, reflecting, smoking, relaxing, resting, etc.

The average duration of these activities among persons over the age of 15 residing in Metropolitan France, as well as the rates of participation and average duration of the activities for the participants can be seen in Table C-1 in the Online appendices (link at the end of the article). An analysis of the 1985 and 1998 surveys adopting a more restrictive definition of sleep confirms the results presented below.

1.1.3. Combining Partners' Diaries in a Couple's Diary

By combining the daily diary filled in by the partners, it is possible to construct time uses at the level of the couple, with each sequence representing the combination of "male/female activity". The analysis takes into account only the main activities, grouped in *sleep* or *other* of each spouse (F and M). Once combined, this gives four modalities at the level of the couple for a given time slot: *couple sleep* (F sleep and M sleep), *M sleep only* (M sleep and F other), *F sleep only* (F sleep and M other), *couple other* (F other and H other).

The synchrony (or synchronisation rate) of sleep is defined as follows:
synchronisation rate=couple sleep/(M sleep only + F sleep only + couple sleep)

1.2. Sleep, a Highly Synchronised Activity?

The organisation of community living requires the coordination of sleep schedules (Schwartz, 1970) and, like meals (de Saint Pol, 2006), sleep is a highly synchronised activity. According to the 2009 Time Use Survey, nine out of every ten individuals are asleep between 01:00 and 06:00. By way of a comparison, if we look only at individuals who worked on the day of the survey, no more than 80% of this population were working simultaneously, and even that only lasted for one hour (between 10:00 and 11:00).

Furthermore, within couples, the partners seek to coordinate their schedules so that they are able to spend time together (Hamermesh, 2002), which results in increased synchronisation of their sleep. Regardless of the year in question, the sleep synchrony of couples is 10 points higher

than that of pseudo-couples – established by randomly pairing a man and a woman[4] (see Online Appendix, Figure C-I). This difference confirms the existence of a trend towards the synchronisation of sleep within couples, as highlighted by Ricroch (2012), a trend that persists throughout the entirety of the period studied. Given the degree of stability of this synchrony, and in order to ensure that we have a large enough headcount to allow for sufficiently detailed analyses, we then aggregated the three surveys.

Sleep synchrony is not the same in all social classes (Table 1): 82% of the sleep by couples made up of two executives[5] is synchronised; this number falls to 73% among couples made up of two blue-collar workers. At first glance, this 10-point difference may appear small, but given the high level of sleep synchronisation among the French population, it is certainly not insignificant; moreover, the difference is the same as that between couples and pseudo-couples.

However, the proportion of discordant sleep between partners does not reveal the true extent of desynchronisation;[6] it needs to be looked at together with the duration of their sleep, which differs depending on their social status.

Homogamous female blue-collar workers sleep an average of 20 minutes longer than homogamous female executives, while homogamous male blue-collar workers sleep an average of 30 minutes longer than homogamous male executives. However, there is no significant difference in the amount of time that the partners spend sleeping together between these two categories of couple. The additional sleep enjoyed by blue-collar workers when compared with executives therefore results mainly in an increase in the time spent by the partners sleeping alone: the desynchronisation of homogamous executives accounts for an average of 1 hour 45 minutes, whereas that of homogamous white-collar workers amounts to an average of 2 hours and 45 minutes, while the figure among homogamous blue-collar workers is 3 hours (Figure I).

However, these static indicators alone, namely the synchrony and duration of the (de)synchronisation of couples, only partially capture sleep management and do not take account of the chronology of the conjugal organisation of sleep. Identical sleep synchrony can mask different ways of organising sleep, resulting from preferences for particular arrangements or limitations, particularly professional, that impact upon the couple's ability to manage their time. Not all couples are equal in terms of time; they have varying degrees of flexibility when it comes to managing their time use depending on the employment status of the partners and the freedom that they have in determining their working hours (Lesnard, 2008). The (de)

4. In the interest of ensuring consistency with the population studied, which is made up entirely of heterosexual couples, the random couples are also exclusively heterosexual.

5. The socio-professional classifications (PCS) of the couples are defined in Appendix 1.

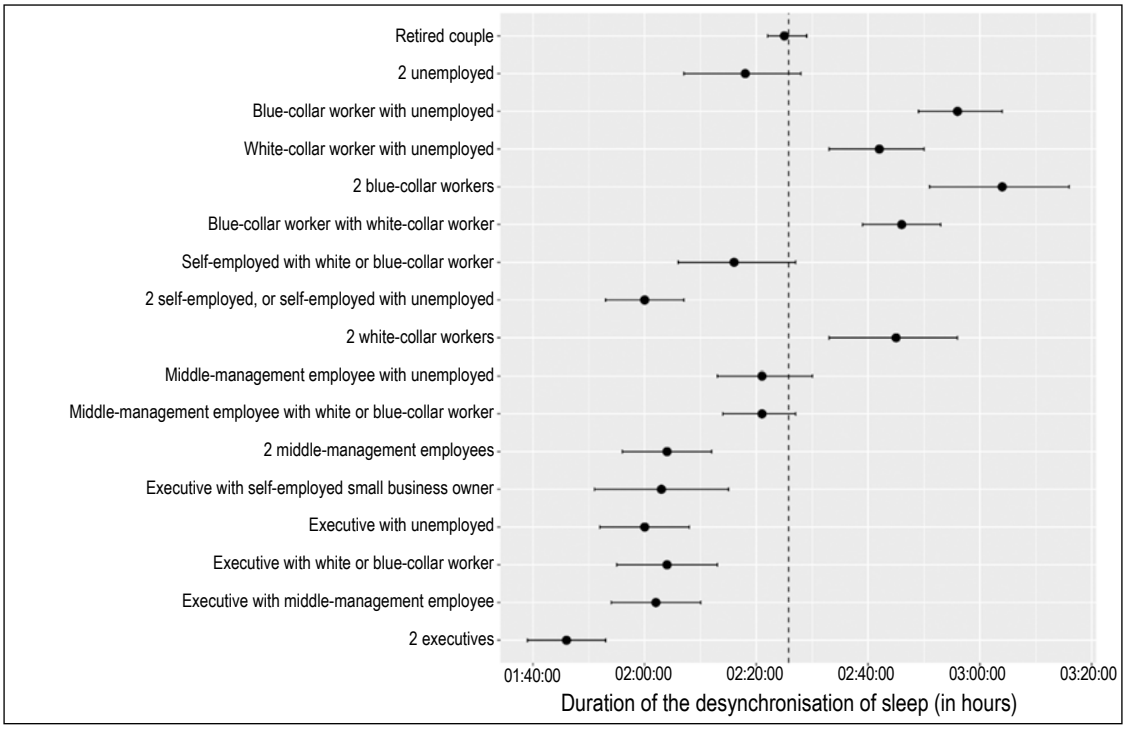
6. In the remainder of the article, unless otherwise specified, (de)synchronisation is used in reference to the (de)synchronisation of sleep in the same way as synchrony refers to sleep synchrony.

Table 1 – **Sleep synchrony by social class of the couple (in %)**

Partners' social category	Synchrony
2 executives	81.9
1 executive and 1 middle-management employee	79.8
1 executive and 1 white or blue-collar worker	79.7
1 executive and 1 unemployed	80.3
1 middle-management employee or executive and 1 self-employed	79.7
2 middle-management employees	80.0
1 middle-management employee and 1 white or blue-collar worker	78.0
1 middle-management employee and 1 unemployed	77.7
2 white-collar workers	74.6
1 self-employed and 1 self-employed or unemployed	80.3
1 self-employed and 1 blue or white-collar worker	79.2
1 blue-collar worker and 1 white-collar worker	74.8
2 blue-collar workers	72.9
1 white-collar worker and 1 unemployed	75.4
1 blue-collar worker and 1 unemployed	74.0
2 unemployed	79.6
2 retired	79.2
Total	78.1

Reading Note: On average, 79.2% of the sleep of retired couples is synchronised.
Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 19,076 heterosexual couples, Metropolitan France.

Figure I – **Average duration of sleep desynchronisation by couples' social category (PCS)**



Note: The dotted vertical line represents the average duration of desynchronisation across the sample as a whole. The segments represent the 95% confidence interval.
Reading Note: The average duration of desynchronisation for couples combining an executive and an unemployed partner is two hours.
Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 19,076 heterosexual couples, Metropolitan France.

synchronisation of sleep within couples may therefore reflect these social inequalities.

1.3. A Typology of the (De)synchronisation of Sleep Within Couples

In order to study in more detail the factors behind desynchronisation and how they have changed between the mid-1980s and the late 2000s, we establish a typology for the organisation of sleep within couples by means of a sequence analysis (see Box and Figure II). Three broad types of organisation emerge: synchronised sleep, partially desynchronised sleep and largely desynchronised sleep.

1.3.1. Synchronised sleep

The three most synchronous types of organisation with a sleep synchronisation rate of around 80% are *long synchro nights*, *short synchro nights* and *night owl partners* (Table 2). Synchronised

Box – **Establishment of the Typology of the Temporal Organisation of Sleep Within Couples**

The diaries filled in by couples can be considered as sequences of activities carried out over 288 five-minute periods. By analysing these sequences, it is possible to compare the ways in which different couples use their time (see sub-section 1.1.3.) and then to establish a typology for the organisation of sleep within the couples. The analysis takes place in two stages: first a matrix is defined for the distance between the couples' time uses, then they are grouped into the most homogeneous classes possible.

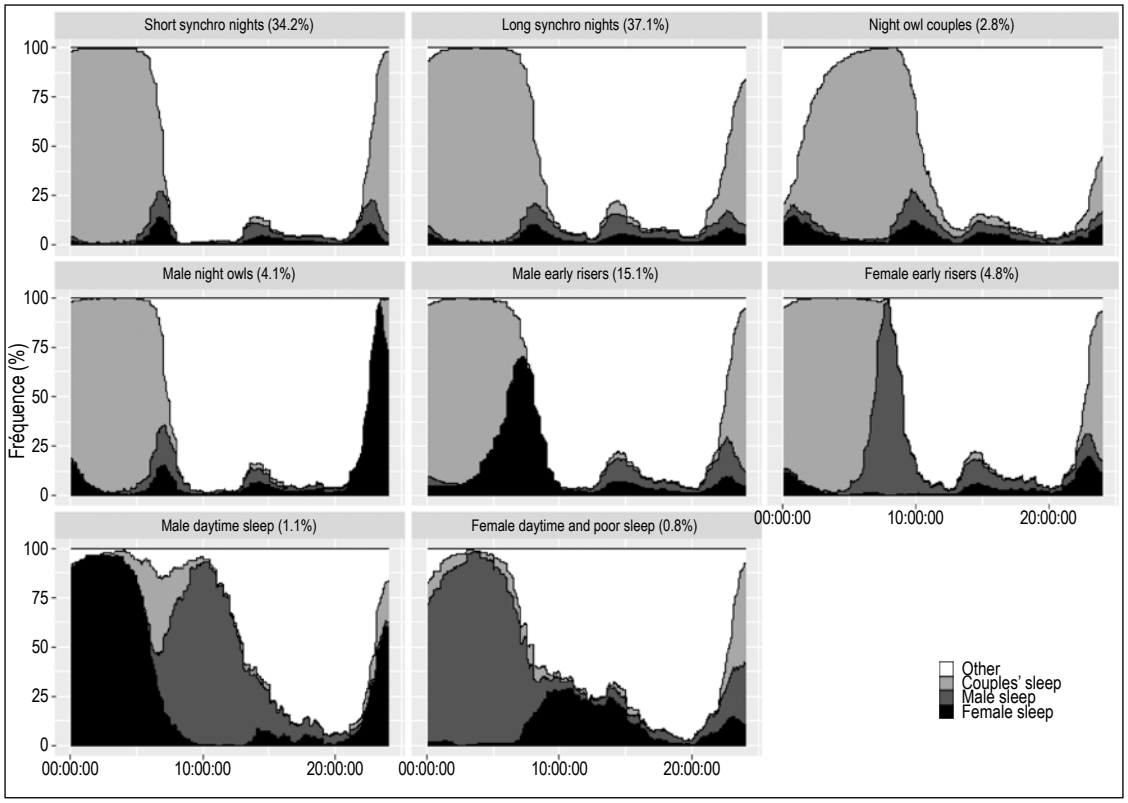
The distance between the time uses is defined using the Dynamic Hamming method (Lesnard, 2010), which allows the temporal structure of the time use to be preserved and takes account of the fact that sleeping rather than doing something else has different consequences depending on the time of day.

We then carry out the classification on the basis of the distance matrix obtained using the PAM (Partition Around Medoids) method. This method allows for the identification of *k* medoids and then the assignment of each observation to the nearest medoid. The aim is to find the *k* medoids that minimise the distance between the observations and these medoids.

Having defined 15 classes using the PAM algorithm, we make the relevant groupings manually, using the chronograms for each class and the time uses of the medoids, comparing their structure. This results in 8 classes [(a)].

[(a)] The initial typology in 15 classes and the correspondence table are provided in the Online Appendix (Figures C-II and C-III and Table C2-2). A typology of activities carried out over a 24-hour period from 21:00 to 21:00 on the basis of the 2009 survey produced very similar results.

Figure II – **Typology of the organisation of sleep within couples**



Reading Note: Among couples that include a *male early riser*, at 08:30, the female is sleeping alone in 30% of couples.
Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010;19,076 heterosexual couples, Metropolitan France.

sleep accounts for three quarters of couple days (Table 3). Half of the individuals belonging to the *long synchro nights* and *short synchro nights* are in bed by 22:40 (Table 4).[7] The difference between these two groups are the times that they wake up: the median rising time for persons in the *short synchro nights* group is 06:50, whereas half of those in the *long synchro nights* group are still asleep at 08:00. Naps are also more common within the *long synchro nights* group. The *night owl partners* are also highly synchronised, but are up later than the previous groups. The result of this high level of synchrony is that the amount of time spent sleeping is almost identical for both partners.

1.3.2. Partially Desynchronised Sleep

Couples made up of *female early risers*, *male early risers* and *male night owls* represent a quarter of the sample. Around two-thirds of couples' sleep is synchronised in this case. In couples with a *female early riser*, the median bedtime of both men and women is identical. However, the median rising time for women is two hours earlier than for men (06:50 *vs.* 09:00). The median difference in sleep time between the partners is two hours in favour of men.

7. The difference when compared with the median bedtime of "short-night" women is not significant.

Table 2 – **Characteristics of sleep by type of organisation**

	Duration of sleep (in hours)		Duration of desynchronisation (in hours)	Synchrony (%)
	Women	Men		
Long synchro nights	9 hours 44 minutes	9 hours 56 minutes	1 hour 53 minutes	83.9
Short synchro nights	8 hours 12 minutes	8 hours 20 minutes	1 hour 31 minutes	84.2
Night owl partners	9 hours 16 minutes	9 hours 8 minutes	2 hours 12 minutes	79.8
Female early riser	8 hours 7 minutes	10 hours 30 minutes	4 hours 7 minutes	65.1
Male early riser	9 hours 35 minutes	7 hours 36 minutes	4 hours 1 minute	63.1
Male night owl	8 hours 57 minutes	7 hours 27 minutes	3 hours 10 minutes	68.7
Male daytime sleep	8 hours 38 minutes	7 hours 18 minutes	12 hours 44 minutes	11.2
Female daytime and poor sleep	3 hours 39 minutes	8 hours 49 minutes	9 hours 54 minutes	11.6

Reading Note: The women in couples with *long synchro nights* sleep for an average of 9 hours 44 minutes.
Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 19,076 heterosexual couples, Metropolitan France.

Table 3 – **Composition of the types of sleep organisation (%)**

	Long synchro nights	Short synchro nights	Night owl partners	Female early riser	Male early riser	Male night owl	Male daytime sleep	Female daytime and poor sleep	Total
Total	37.1	34.2	2.8	4.8	15.1	4.1	1.1	0.8	100.0
Year									
1985	35.8	37.8	1.9	4.5	14.7	3.4	1.3	0.6	100.0
1998	37.5	34.3	2.7	4.6	15.6	4	0.9	0.3	100.0
2009	37.8	30.6	3.9	5.3	14.9	4.9	1.2	1.4	100.0
Average age of the couple									
< 25	36.2	20.7	11.8	5.0	20.6	2.3	3.1	0.2	100.0
25-34	33.7	31.4	5.2	5.5	17.4	4.1	1.9	0.8	100.0
35-44	29.6	38.9	3.1	4.5	16.0	5.4	1.6	0.9	100.0
45-54	29.4	40.0	2.1	5.0	17.5	4.3	1.1	0.6	100.0
55-64	41.4	34.5	1.1	4.8	12.6	4.3	0.3	0.9	100.0
65+	54.2	28.0	0.6	3.9	10.0	2.5	0.0	0.7	100.0
Employment status of the couple									
Unemployed	53.7	27.3	1.3	4.3	9.7	3.0	0.1	0.6	100.0
Both employed	28.5	40.7	3.7	4.7	15.3	4.7	1.6	0.8	100.0
Only the woman is employed	36.4	33.5	2.9	11.7	8.4	5.5	0.2	1.4	100.0
Only the man is employed	32.5	30.1	3.1	3.2	24.6	3.9	2.0	0.6	100.0
Type of work day									
Did not work	55.4	22.1	4.4	4.8	9.6	2.9	0.1	0.6	100.0
Both partners worked	14.9	59.4	0.7	2.5	13.8	6.0	1.8	0.9	100.0
Only the woman worked	26.8	38.9	2.0	18.6	5.0	6.1	0.4	2.2	100.0
Only the man worked	19.7	34.3	1.7	1.9	34.4	4.1	3.2	0.6	100.0

Reading Note: 53.7% of unemployed couples belong to the *long synchro nights* group.
Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 19,076 heterosexual couples, Metropolitan France.

Table 4 – **Sleep schedules by type of organisation**

	Median bedtime		Median difference in bedtimes	Median rising time		Median difference rising times
	Women	Men		Women	Men	
Long synchro nights	22:40	22:40	10 minutes	08:00	08:00	30 minutes
Short synchro nights	22:45	22:40	15 minutes	06:50	06:50	30 minutes
Night owl partners	01:35	01:50	10 minutes	10:00	10:00	30 minutes
Female early riser	23:00	23:00	30 minutes	06:50	09:00	2 hours 10 minutes
Male early riser	22:40	22:30	25 minutes	08:00	06:00	2 hours 5 minutes
Male night owl	22:30	00:00	1 hour 30 minutes	07:00	07:00	40 minutes
Male daytime sleep	22:45	07:00	6 hours 40 minutes	07:15	13:02	6 hours
Female daytime and poor sleep[a]		22:50			07:30	

[(a)] as the sleep was observed over two half-nights and due to the less atypical nature of the organisation of sleep during the second half-night, the median times at which the women in this category got up and went to bed cannot be interpreted.
Notes: The times at which persons got up and went to bed are calculated for periods of night-time sleep (or daytime sleep for those who work nights); bedtime: first period of sleep from 20:00, with the exception of *night owl partners*, whose bedtime corresponds to the first period of sleep after midnight; rising time: last period of sleep before noon, except for *i)* male and female *night owl partners*: last period of sleep before 14:00; *ii)* men undertaking *male daytime sleep* and women undertaking *female daytime sleep*: last period of sleep before 16:00. Median bedtime (rising time): time at which half of the individuals have gone to bed (got out of bed). Median difference in bedtimes (rising times): median difference in the times that the partners go to bed (get out of bed).
Reading Note: Half of the women in the *long synchro nights* type are in bed by 22:40.
Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 19,076 heterosexual couples, Metropolitan France.

The opposite is true for *male early riser* couples: the partners go to bed at similar times, but half of the men are up at 06:00, while half of the women are still sleeping at 08:00. The median difference in sleep time between partners is 1 hour 50 minutes in favour of women.

In couples with a *male night owl*, women begin their night alone: half are in bed by 22:30, while half of the men are still up at midnight. However, the desynchronisation is less marked at the end of the night: the median rising time is the same for both men and women (07:00). This partial desynchronisation results in a median difference in sleep time of 1 hour 20 minutes in favour of women.

1.3.3. Largely Desynchronised Sleep

The types *male daytime sleep* and *female daytime and poor sleep* take account of a highly

discordant organisation of sleep: 90% of the couples' sleep is desynchronised. *Male daytime sleep* describes a situation in which a woman sleeps during the night and her partner sleeps during the day. Once again, this desynchronisation results in a median difference in sleep time of 1 hour 10 minutes in favour of women. *Female daytime and poor sleep* takes account of the opposite situation, where the man sleeps during the night and the woman during the day. However, the organisation of sleep within this group suggests that some women have barely slept at all, which explains the large difference in sleep time between partners (median of 6 hours in favour of men).

Therefore, in a quarter of the couple days studied, at least a third of the couple's sleep is desynchronised. With the exception of sleep schedules where one of the partners sleeps during the day, the desynchronisation of sleep occurs primarily at the time of going to bed or the time of getting up, with the delay by one of the partners being only partially cancelled out. The fact that one of the partners goes to bed later does not necessarily mean that they get up the same amount of time later, and vice versa. For example, among couples made up of a *female early riser* and a *male early riser*, the median desynchronisation of bedtimes is around half an hour, whereas the desynchronisation of rising times is a little over two hours. This partial desynchronisation of bedtimes therefore results in the partners having different sleep durations.

1.4. The Social Gradient of Sleep Synchronisation

The temporal organisation of sleep differs between social categories, as illustrated by the correspondence factor analysis (CFA) carried out on the typology of sleep (de)synchronisation and the professions and socio-professional categories within couples. The first axis of the CFA is heavily polarised by retired couples,[8] who are very different from all the other couples, with the exception of the unemployed and the homogamous executives. As regards sleep, *long synchro nights* are different from all of the other ways of organising sleep. Due to the strong polarisation of this first axis and the fact that retired couples include all retired persons, who present the particularity of no longer being in employment, we performed a second CFA, creating an additional option for retired couples.

The first axis of this new CFA (Figure III) reveals that the situation of unemployed couples or those that are predominantly executives is very different from that of couples who are predominantly blue-collar workers. The former are associated with synchronised sleep and the latter with a desynchronised organisation of sleep (with the exception of *male night owl* couples). The second axis compares two ways of organising synchronised sleep with different durations: *long synchro nights* and *short synchro nights*. The latter are associated with self-employed couples or couples made up of one self-employed partner and one unemployed partner, while *long synchro nights* are associated with couples made up of two unemployed partners or combining one unemployed partner and one white or blue-collar worker.

The conjugal organisation of sleep therefore forms part of the social space. Couples comprised of retired persons and unemployed persons under the age of 60, and the most privileged employed persons are associated with synchronised sleep, while those occupying the least privileged positions have the most desynchronised sleep. Does this difference reveal different preferences with regard to the synchronisation of sleep or, conversely, differing time constraints, particularly in connection with professional activities? The least well-off individuals are more likely to work shifts, which results in a desynchronisation of working hours within the couple, while couples with a more favourable social standing have more opportunity to establish synchronous working days (Lesnard, 2008). The desynchronisation of partners' working hours can also result in the desynchronisation of sleep schedules. We will now also look at the composition of this desynchronisation in order to determine the extent to which sleep-parallel activities are limited or chosen.

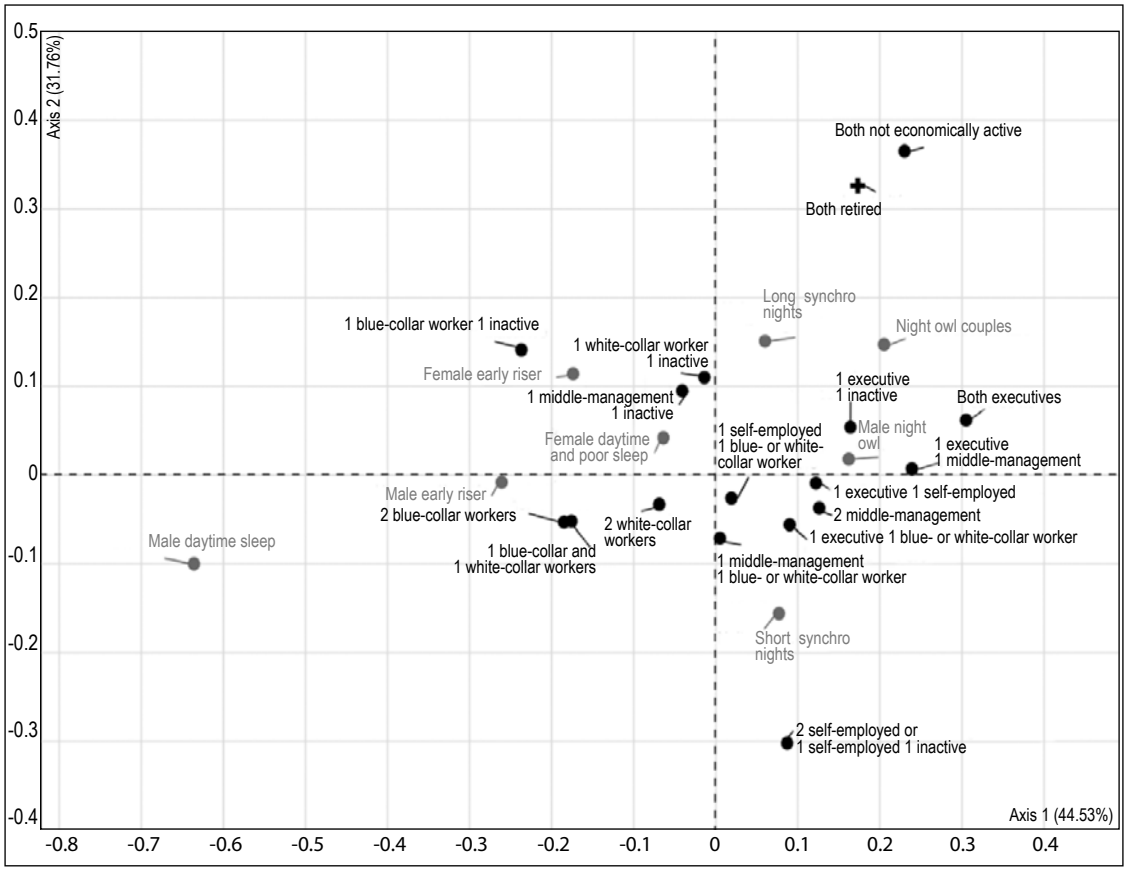
2. Structure of the Desynchronisation of Sleep Within Couples

2.1. A Reduction in the Synchronisation of Sleep Between Partners

Given the stability of the average synchronisation between the three surveys, our typology is established on the basis of all of the surveys. However, under closer scrutiny, it can be seen that this stability actually masks some changes that cancel one another out if we limit ourselves to looking at average trends over a period of 25 years.

8. Retired couples contribute to 60% of the variance in the position of the couples' socio-professional categories for the first axis.

Figure III – **Social space and organisation of sleep**



Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 19,076 heterosexual couples, Metropolitan France.

Between the mid-1980s and the late 2000s, the structure of the population of individuals in couples has been changing. Couples are getting older: the proportion of couples aged under 25 fell between the mid-1980s and the late 1990s, but then remained stable until the late 2000s; the proportion of couples aged over 60 increased due to the increase in life expectancy at older ages (Daguet & Niel, 2010[9]).

As a result of this ageing of couples and the increase in employment among women, the distribution of couples by employment status is also changing. In 2009, unemployed couples accounted for one-third of couples, whereas they only accounted for one-quarter of couples in 1985. Of the couples where at least one of the partners is employed or a student, in the share of those with both partners are employed increased, from 60% of couples in 1985 to 66% of couples in 2009. Conversely, the proportion of couples in which only the man is employed is decreasing, from one-third to one-fifth.

There has therefore been an increase in the number of couples with the strongest tendency to synchronise. However, between the mid-1980s and the late 2000s, average sleep synchrony actually decreased. In 2009, partners spent an average of 7 hours 35 minutes sleeping together, 13 minutes less than in 1998 and 1985. This reduced synchronisation can be seen in almost all social classes.[10]

At the same time, the organisational landscape of sleep is being partially rebuilt (see Table 4). The most synchronised ways of organising sleep account for 72% of the 2009 couple days, compared with 76% in 1985. However, the changes to synchronised nights are not uniform: although the proportion of *short synchro nights* has decreased by 20%, there were twice as many *night owl partners* in 2009 as there were in 1985 and the proportion of *long synchro nights* has remained relatively stable.

Within couples for whom desynchronisation results from a shift in the sleep schedules of men, only *male night owls* couples are more prevalent, increasing by 40%. There has been a more significant increase in

9. It should be noted that we are reasoning at the couple level, by considering the average age of the partners, whereas Daguet & Niel reason at the individual level.

10. Desynchronisation remains stable in couples where both partners are executives, couples combining a self-employed partner and a white or blue-collar worker, retired couples and couples combining a blue-collar worker and an unemployed partner.

desynchronisation resulting from a shift in women's sleep schedules: *female early riser* couples have increased by 18% and, although they remain a marginal group, couples with *female daytime and poor sleep* account for 2.3 times more couples in 2009 than in 1985 and are now equal in number *male daytime sleep* couples. The *female daytime sleep* configuration saw its greatest increase between 1998 and 2009, which may be explained by the fact that night work is increasing at a faster rate among women than among men (Bué, 2005). The reduced levels of synchronisation among couples could therefore be partly attributable to a change in working hours. However, this does not explain the reduction in synchronisation among retired couples.

2.2. An Increase in Desynchronisation Linked to an Increase in the Amount of Time Spent Watching Television

The fall in sleep synchronisation between the mid-1980s and the late 2000s has not brought about a proportional increase in each of the activities performed in parallel with sleep. It is primarily the result of an increase in the amount of time spent in front of the television while the other person is sleeping: in 1985, television accounted for desynchronisation of 15 minutes; by 2009, this had increased to half an hour. This change can be observed in all types of sleep organisation and across all social classes, with the exception of couples made up of two executives and couples combining a self-employed partner and a partner in an executive or middle-management role.

However, the average amount of time spent working in parallel with sleep remains stable. Whichever year we look at, professional activity[11] accounts for an average of 30 minutes of desynchronisation. This stability can be seen within each type of organisation and each social class; there were no significant changes from one survey to the next. The additional desynchronisation observed between 1998 and 2009 therefore appears to be the result of voluntary desynchronisation to carry out a leisure activity rather than desynchronisation suffered as a result of greater time constraints. Nevertheless, the differences between social classes persist. The change in the structure of desynchronisation concerns almost all types of sleep organisation and social classes; we then reason on the basis of the three surveys simultaneously in order to identify the activities that can be used to differentiate between the different ways of organising sleep.

2.3. Organisation of Desynchronisation

When we look at all years and all types of organisation combined, the activities that account for the majority of desynchronised time are paid work and the associated commutes (31 minutes), television (23 mins), hygiene activities (22 mins), household chores (21 mins) and regular meals (12 mins).

However, the frequency of activities parallel to sleep does not remain uniform throughout the day (Figure IV), and the desynchronisation of getting out of bed is greater than that of going to bed: the median difference between bedtimes is 20 minutes; the difference between the times that the partners get out of bed is twice as long.

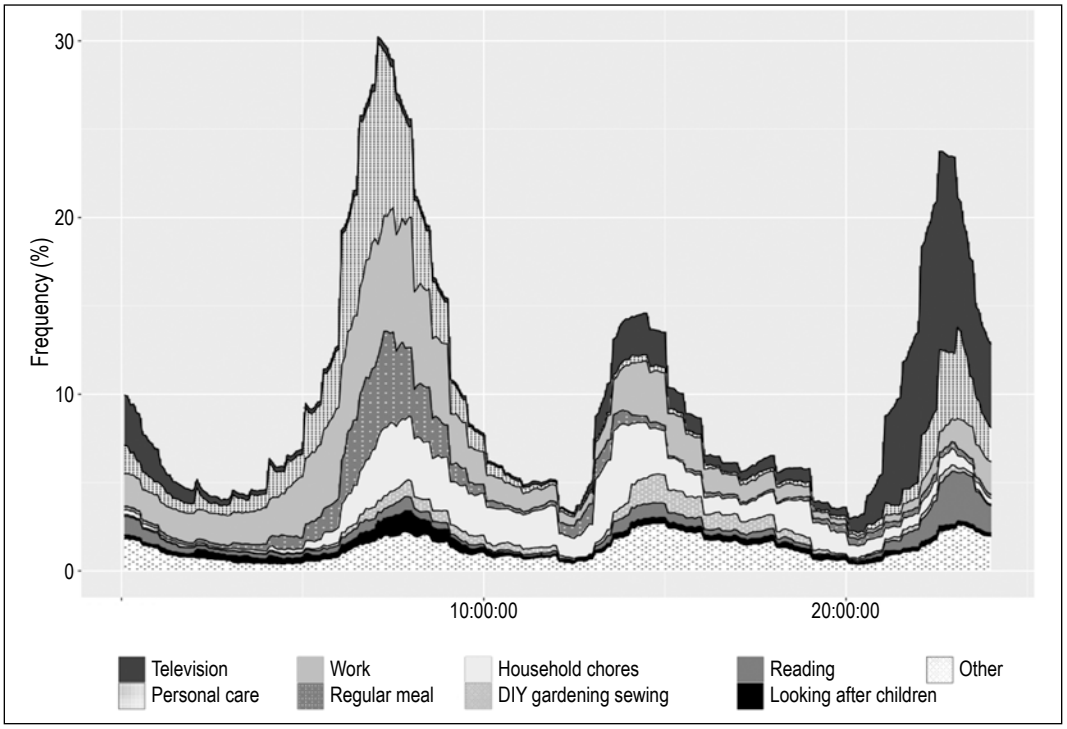
Morning desynchronisation is largely accounted for by work, whether it be paid or unpaid, meals and hygiene activities. By contrast, evening desynchronisation primarily involves television. Reading also features here, something that is almost absent in the morning. Morning desynchronisation is therefore largely linked to essential or restrictive activities, while evening desynchronisation mainly involves leisure activities. The desynchronisation at the start and the end of the day therefore differs in nature. The discordance in the time that partners get out of bed is therefore endured, largely as a result of professional activity, whereas the discordance in bedtimes appears, in the majority of cases, to result from voluntary behaviours, increasing the amount of time spent watching television in particular.

The desynchronisation in the early afternoon is also characterised by its composition: the absence of hygiene activities, but the presence of work (paid or domestic), leisure and semi-leisure activities. This composition, which falls between the morning and evening desynchronisations, can be explained by the specific origin of this desynchronised sleep: it relates to naps, which, according to the typology of the organisation of sleep within couples, is more solitary than other forms of sleep.

Similarly, the structure of desynchronisation differs depending on the type of conjugal sleep involved (Figures V and VI). Baseline desynchronisation made up of household chores, hygiene activities, meals and, to a lesser extent, television, is present regardless of the way in which sleep is organised; however, the frequency

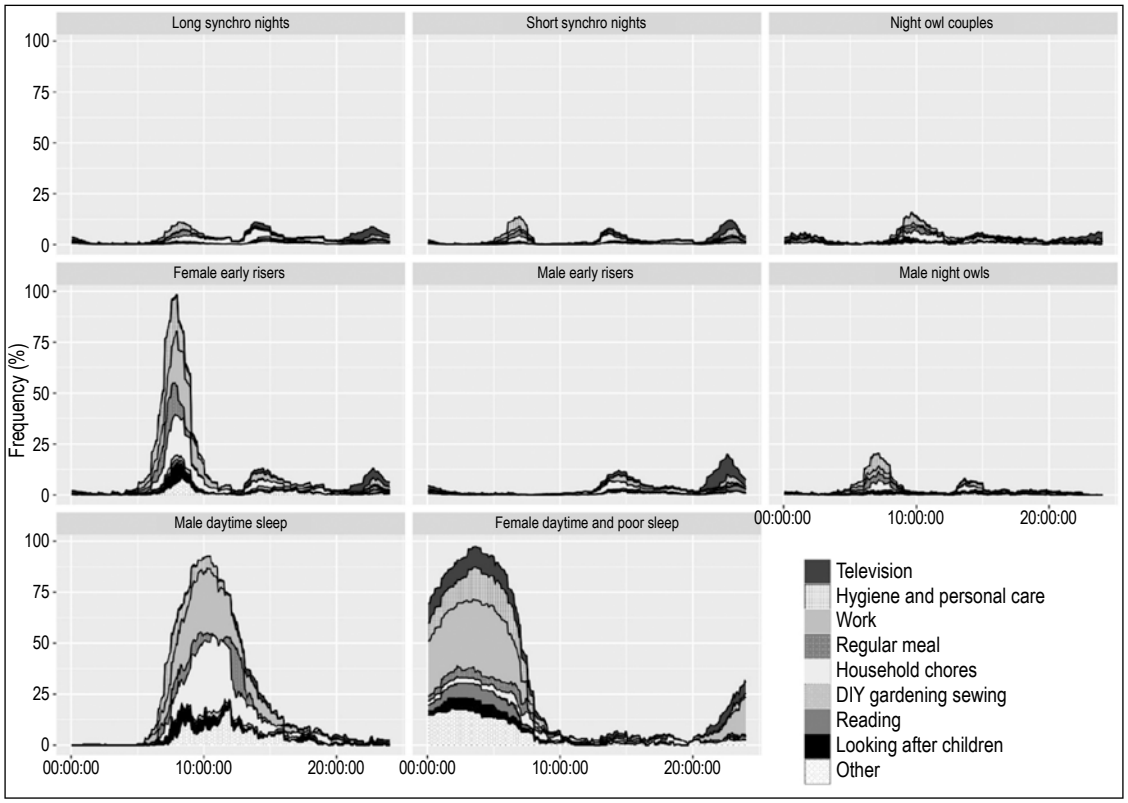
11. We consider work to be all professional activities, studying by students and the commutes associated with these activities, which are inseparable time constraints.

Figure IV – **Composition of the desynchronisation**



Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 19,076 heterosexual couples, Metropolitan France.

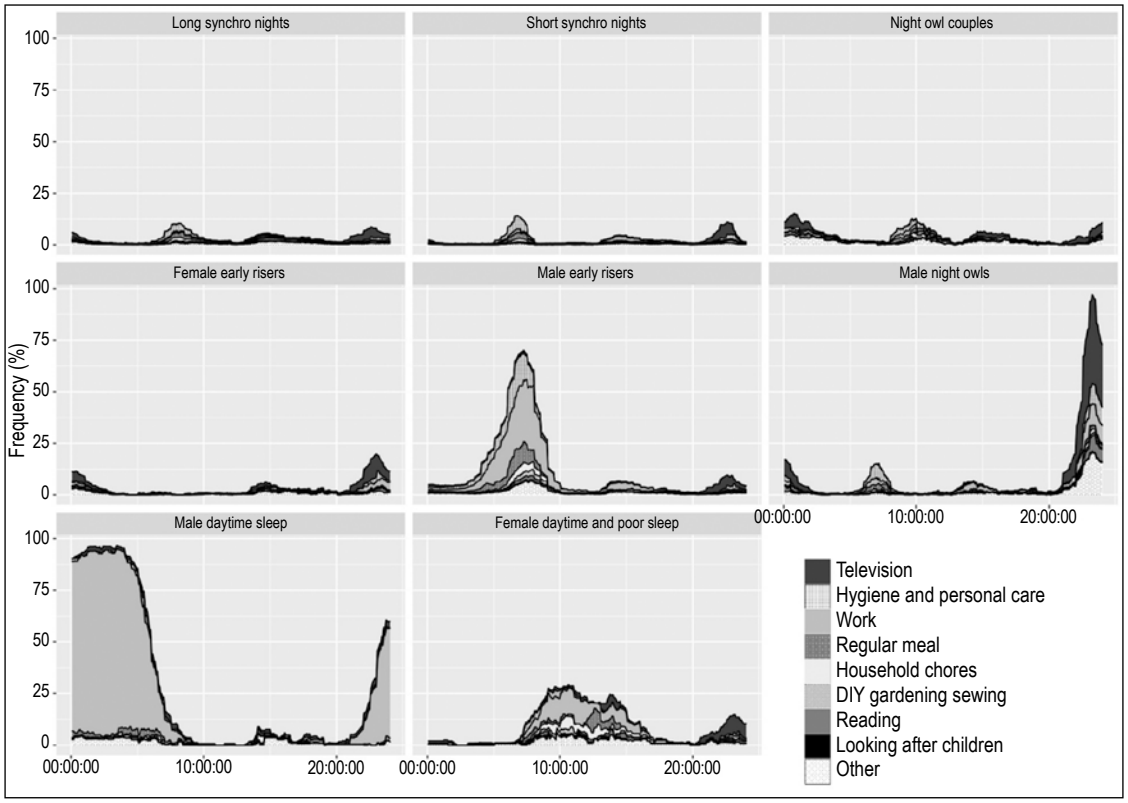
Figure V – **Frequency with which activities are performed by women while their partner is sleeping**



Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 19,076 heterosexual couples, Metropolitan France.

of these activities varies between classes. The desynchronised types are characterised in particular by the presence of paid work. For *female early riser* couples, work accounts for 56 minutes, so 20% of the desynchronised time; for *male daytime sleep* couples, professional activity accounts for 7 hours 30 minutes, so 60% of the desynchronised time. On the other hand, paid work is virtually absent where sleep is organised in a highly synchronised manner,

Figure VI – **Frequency with which activities are performed by men while their partner is sleeping**



Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 19,076 heterosexual couples, Metropolitan France.

accounting for less than quarter of an hour. Couples with a *male night owl* have a somewhat peculiar profile, since television accounts for a significant proportion of the desynchronisation.

3. The Desynchronisation of Sleep, the Result of Social Inequalities

As the organisation of sleep is closely linked to social standing, the extent of desynchronisation differs depending on social class, as does its composition: the amount of time devoted to each parallel activity is not proportional to the total duration of desynchronisation. In other words, the proportion of these activities does not remain stable across social classes (see Online Appendix, Table C-2): watching television accounts for an average of 12 minutes of desynchronisation among couples made up of executives (or 9% of their desynchronisation), 20 minutes among couples made up of two white-collar workers (or 14%) and 25 minutes among couples where one partner is a white-collar worker and the other a blue-collar worker (or 15%). As for professional activity, this represents 11% of the desynchronisation among executives, but 23% of that among couples made up of two white or blue-collar workers or couples where one partner is a white-collar worker and the other a blue-collar worker. A comparison of the amount of time allocated to the desynchronised activities within each of the socio-professional categories appears to reinforce the difference between these couples. Professional activity accounts for an average of 15 minutes of desynchronisation among couples made up of two executives, compared with an hour among white or blue-collar couples or couples where one partner is a white-collar worker and the other a blue-collar worker.

Nevertheless, it is important to bear in mind that the working time measured here does not take account of professional activities that are actually performed while one of the partners is sleeping. In reality, work has a much greater impact on the desynchronisation of sleep. Indeed, an individual does not leap out of bed and immediately start work. At the very least, they perform their morning routine activities, which include hygiene activities and breakfast (for those who do not skip this meal). These habits, which should be considered more as pre-empting the end of the night, must therefore be taken into account.

As a result, the unequal synchronisation between social classes is reflected less by a proportional adjustment of the duration of activities parallel to sleep than by a divergence in the amount of time

devoted to two activities in particular: television and, to an even greater extent, work.

The major differences in synchronisation between different types of organisation and social classes are therefore brought about by the performance of a professional activity in parallel with the sleep of one of the partners, which suggests that the discordance in sleep schedules more often than not results from constraints impacting upon the organisation of time rather than partners deliberately opting for staggered schedules. Also, in the following sub-section, we will look more closely at the link between the conjugal organisation of sleep and professional constraints.

3.1. Desynchronisation of Work, Desynchronisation of Sleep

3.1.1. Professional Constraints and Sleep Synchronisation

As is suggested by the position of retired couples in the social space of the organisation of sleep, the most synchronised couples are those in which neither partner is employed. However, the greatest influence on the synchronisation of the partners, more so even than their employment status, is the type of day: the landscape of the conjugal organisation of sleep differs depending on whether both partners, one partner or neither partner worked on the day of the survey.

Sleep is synchronised to the greatest degree during non-working days, with average synchrony of 80%. Four out of every five non-working couple days are found within the three most synchronised classes, and half of these are among the *long synchro nights*. The days on which both partners worked fall in the middle, with three quarters being among the most synchronised ways of organising sleep. Finally, the most desynchronised are those where only one of the partners worked, particularly in cases where only the man went to work. The average synchrony on these days is 73% and a third of the couples involved are those with a *male early riser*. There are also four times as many *female early risers* for the days on which only the woman went to work than are seen in the sample as a whole.

However, taken in isolation, the observation of a correlation between the organisation of sleep and the fact of having worked or not provides limited information with regard to the extent to which professional activity can affect sleep. The times at which people start and end their working day provide an initial indication of the influence this can have on the conjugal organisation of sleep. Half of couples with a *male early riser* who worked started their working day at 06:50 or earlier, so 45 minutes before their peers in the *short synchro nights* couples, and two hours before those in the *long synchro nights* couples (Table A2-1 in the Appendix). Men belonging *male daytime sleep* couples also have median start and end times for their working day that correspond to night work. In addition, if we limit ourselves to only looking at couples in which both partners worked, the median time between the start of the partners' working day is three hours among *male early riser* couples, whereas it was just 40 minutes among couples with *long synchro nights*.[12] These differences in the types and organisation of sleep suggest that the start of the working day in the morning dictates the time at which individuals get up.

3.1.2. Tell Me How You Sleep, I Will Tell You How You Work

The above results suggest that partners' sleep schedules and the options they have for coordinating them are strongly linked to the organisation of their working days. In order to more closely analyse the influence of professional activity on sleep synchronisation, we will look at the extent to which couples who organise their sleep in a similar way also have similarly organised professional lives.

In order to do so, by restricting our analysis to couples in which both partners work,[13] we are cross-referencing the typology of sleep organisation with a typology of the working days of the couples, established using the same method: the activities of each of the partners are dichotomised into *work* and *non-work*, then the couple's activities are coded as *female work, male work, couple's work and non-work*. They include 13 types of day (see Figure A2 in Appendix 2). We performed a correspondence factor analysis (CFA) on the table cross-referencing the types of sleep organisation and the types of working days.

The first axis of the CFA represents half of the inertia of the point cloud linking *male daytime sleep* to the *male night-female day* way of organising work. These very specific ways

---

12. The median difference in the time at which couples who worked got out of bed was 2 hours 10 minutes among those with a male early riser *and 20 minutes among those with* short synchro nights.

13. Couples in which both partners work correspond in this case to couples where the two partners are employed or are students. We retain all couples meeting this condition, regardless of whether or not they worked on the day of the survey.

of organising work and sleep are the opposite to all the others and highlight the reversal of the diurnal rhythm brought about by night work. Sleep is normally a night-time activity and only becomes a daytime activity under the constraint of nocturnal professional activity.

In order to better differentiate between the other types of organisation, we performed a second CFA (Figures VII and VIII) by positioning *male daytime sleep* and the *male night-female day* way of organising work as additional variables.[14]

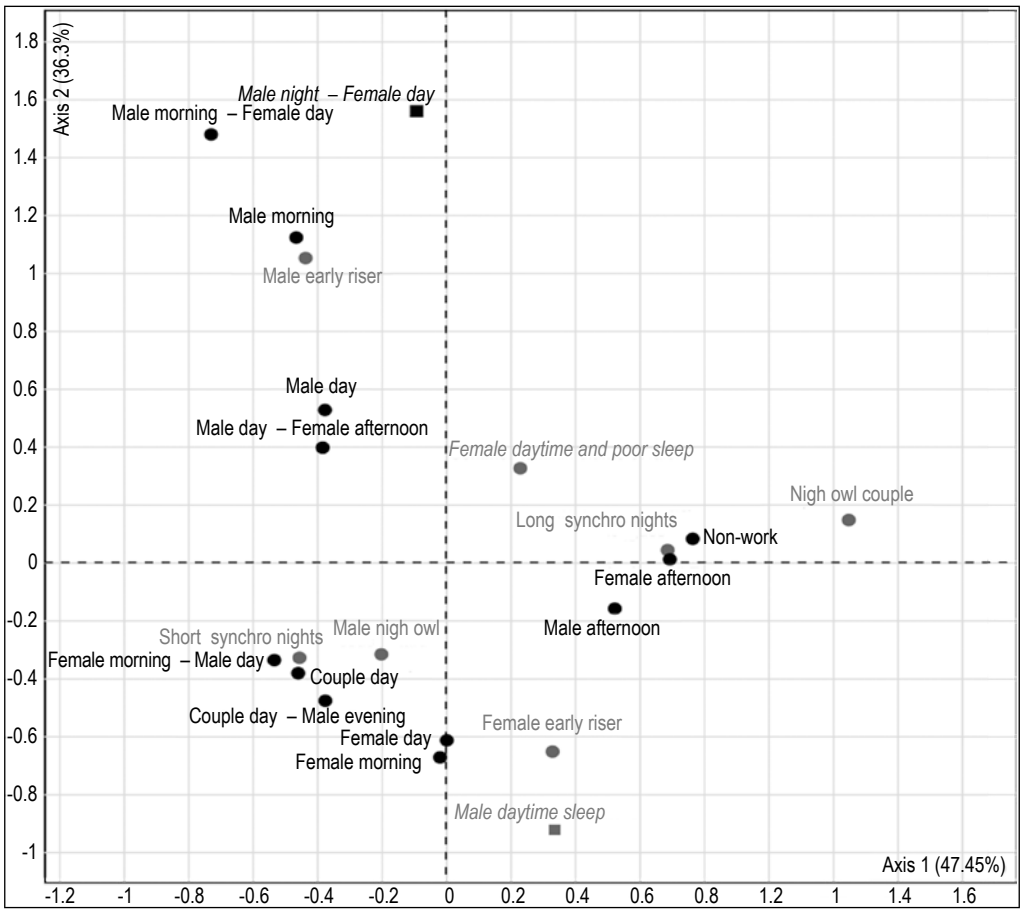
The first axis differentiates between synchronised working days and non-working days. The latter are associated with *long synchro nights* and *night owl partners*, whereas the working days are associated with *short synchro nights*. This axis differentiates between two types of work synchronisation: through the (relatively) synchronised working hours of the partners or by the joint absence of work. Both are associated with synchronous sleep, but on different schedules.

The second axis takes account of the influence of desynchronisation on working days as a result of the man's working hours and the conjugal organisation of sleep. Days during which the man commences his working day very early or is the only partner who goes to work, which are associated with *male early riser* couples are different from the more synchronised working days (*couple days*) associated with *short synchro night* couples and *female early riser* couples. The third axis takes account of the opposite situation, which characterises the desynchronisation brought about by the woman's working hours. Days on which only the woman works, which are associated *female early riser* couples differ from the more synchronised working days (*couple days*).

The CFA therefore highlights coherence between the conjugal organisation of sleep and work. The tendency towards the synchronisation of sleep is undermined when the partners' working hours are too desynchronised or atypical: excessive discordance in their working days results in discordance in their sleep schedules. The more

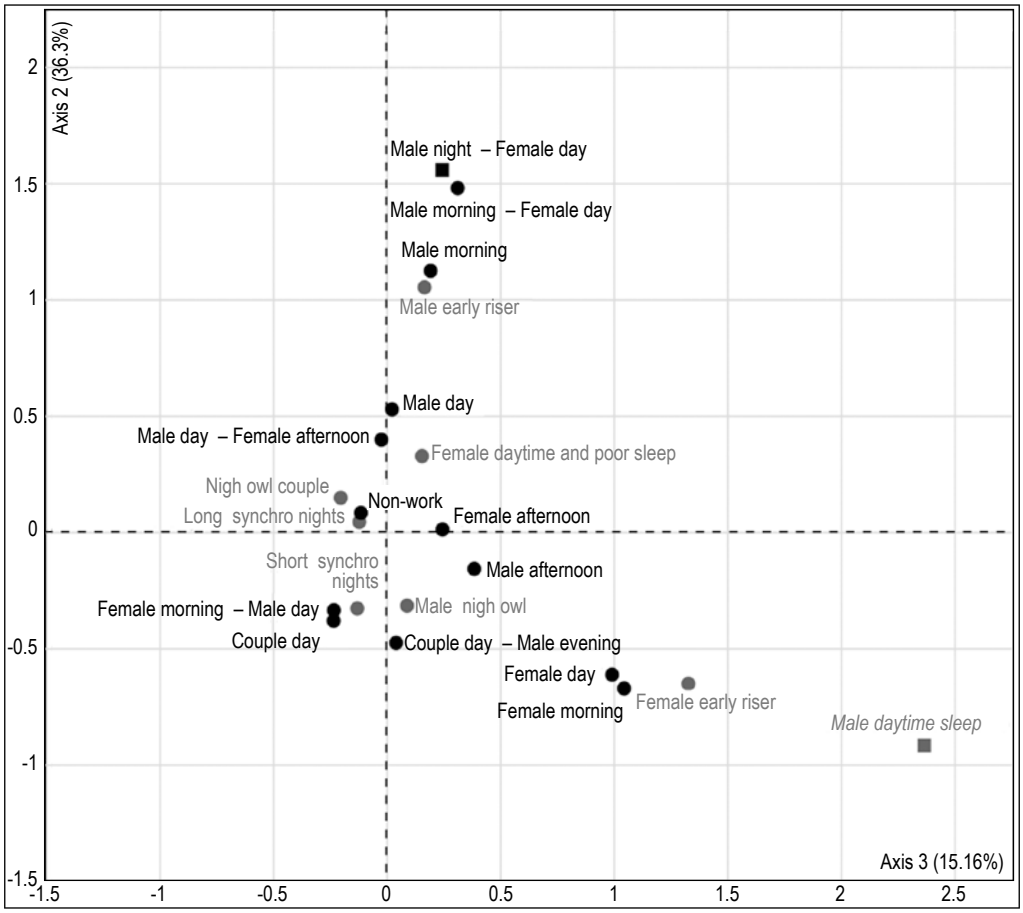
14. We retained the first three axes, which represent 47.4%, 36.3% and 15.2% of the total inertia, respectively.

Figure VII – **Organisation of sleep and work, plotting of the first two axes of the CFA**



Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 8,762 heterosexual couples within which the two partners are employed or students, Metropolitan France.

Figure VIII – **Organisation of sleep and work, plotting of axis 2 and 3 of the CFA**



Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 8,762 heterosexual couples within which the two partners are employed or students, Metropolitan France.

desynchronised their working hours, the more out of sync their sleep becomes.[15] By imposing its schedule, professional activity restricts the ability of individuals to organise their daily activities and, of course, their sleep.

The more freedom the partners have in setting their own working hours, the more synchronised their sleep (Table A2-2 in Appendix 2). Among the couples in which both partners worked, 86% of those who are able to set their own working hours enjoyed a night of synchronised sleep, compared with 72% of those who both have restrictive working hours. The synchronisation of sleep within couples therefore reflects the way in which their working days are organised: the less their working hours coincide, the less time the partners spend together (Lesnard, 2008) and the less they are able to coordinate their sleep. As is the case with the synchronisation of working hours, sleep synchronisation reflects the inequality suffered by individuals on the labour market. The least qualified individuals are most likely to have working hours that conflict with those of their partner and the same is true of their sleep schedules.

3.2. The Gender of Desynchronisation

Sleep desynchronisation reflects another type of inequality: gender inequalities regarding the division of labour within couples. Indeed, the composition of desynchronisation varies depending on the gender of the person who is awake. Men spend more time at work than women, while the latter perform more household chores. Across all types of organisation, women devote an average of 20 minutes to household chores while their partner is sleeping, four times longer than is spent by men on these tasks while their partner is sleeping. However, men spend an average of 22 minutes working while their partner is sleeping, compared with 9 minutes for women. This gendered difference in the composition of desynchronised activities is stable across all three surveys, even though the gap between men and women for these two activities is narrowing (Brousse, 2015).

15. Within couples in which both partners work and indeed worked on the day of the survey, the coefficient of determination between the sleep synchronisation rate and the work synchronisation rate is 0.52; in other words, half of the variance in the sleep synchronisation rate is explained by its correlation with the synchronisation of work.

The gender inequalities present in the desynchronisation are most visible in the two types of morning desynchronisation (couples that include a *female early riser* and couples that include a *male early riser*). These are organised in very similar ways: one partner ends the night alone; however, this quasi-symmetry in the organisation of sleep is not seen when it comes to the organisation of sleep around work. Although *male early riser* couples are primarily associated with days on which only the man works, *female early riser* couples are associated with days worked by women and synchronised working days. It therefore does not appear that professional activity is the only factor behind women getting out of bed early, as is the case for men.

By separating out the duration of activities according to gender, women belonging to *female early riser* couples perform 48 minutes of paid work and 54 minutes of household chores, while men belonging to *male early riser* couples perform 1 hour 18 minutes of paid work and 12 minutes of household chores. Men and women therefore do not get up earlier than their partners for the same reasons.

In order to compare the share of personal activities with the share of joint activities during the desynchronised time, we calculate a ratio measuring the personalisation of the desynchronised time spent awake between midnight and noon: (work + hygiene + meals + reading + television) / (work + hygiene + meals + reading + television + household chores + looking after children)

Only the duration of the activities performed while the other partner is sleeping is taken into account when calculating the ratio. The higher the ratio, the higher the share of personal activities in the desynchronised time spent awake. We compare the personalisation of activities within *male early riser* and *female early riser* couples.

Between midnight and noon, 90% of the desynchronised activities performed within *male early riser* couples have no direct joint purpose; however, this is only the case for two thirds of the activities performed within couples that include a *female early riser*. The share of personal activities in the desynchronised time spent awake is 1.4 times greater among men than among women.

However, the days among *female early riser* couples and *male early riser* couples are not perfectly comparable: half of women within the former did not work on the day in question, compared with a third of men in the latter. The lower frequency of professional activity among *female early riser* couples could therefore mechanically reduce the personalisation of their activities. Also, in order to measure the gender-specific effect on the personalisation of the time spent awake, we will estimate a multiple linear regression model with an interaction effect between gender and the type of day (working day or non-working day) and an interaction effect between gender and the presence of at least one child under the age of 7 in the household (Table 5).

The interaction effect between gender and the type of day is significant, which highlights that it is not just professional activity that determines the composition of desynchronisation; the gender of the partner who is awake also has an influence. We now reason on the basis of the adjusted mean predictions, obtained by setting the modalities of certain variables and taking the mean values observed for the other variables, which are easier to understand than those of the interaction coefficients.

The predicted personalisation ratio is consistently lower for women than for men and it presents greater variation (Figure IX-A). The absence of work on a given day does not bring about an identical reallocation of time among men and women and the difference in the activities performed is greater on non-working days. The rate of personalisation of the activities carried out by men on non-working days does not differ significantly from that of women on working days. Even if they worked on the day of the survey, women allocated a larger proportion of the time they spent awake and alone on domestic tasks than men did.

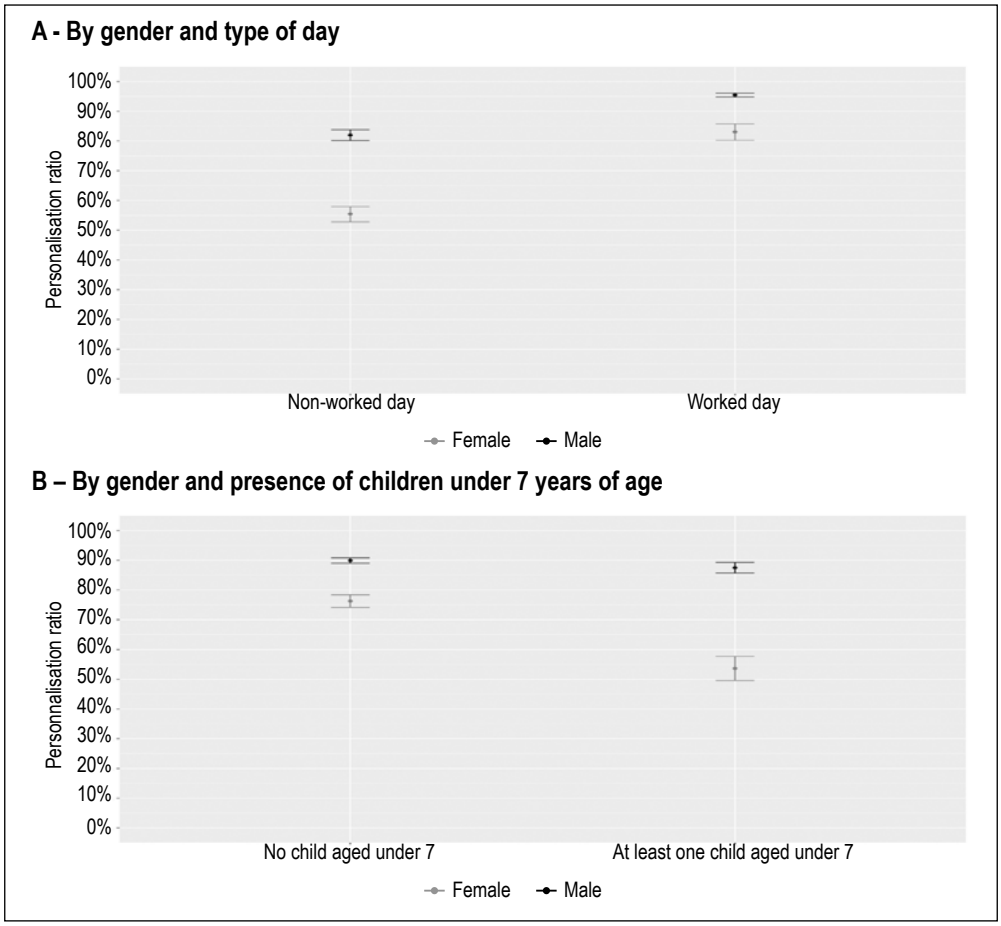
The presence of young children also has an effect on the gender of the individual who gets up early. Having at least one child under the age of 7 significantly reduces the personalisation of

Table 5 – **Multiple linear regression modelling the personalisation of time spent awake and alone**

Constant	0.887 ***
Male	0.071 ***
Non-working day	-0.277 ***
At least one child under the age of 7	-0.226 ***
Male×non-working day	0.154 ***
Male×at least one child under the age of 7	0.202 ***
R^2	0.327
R^2 adjusted	0.327

Reading Note: On a non-working day and for individuals without children, being a man rather than a woman increases the personalisation of time spent awake by 7 percentage points. Significance: ***< 0.001. Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 4,300 individuals belonging to *male early riser* and *female early riser* couples.

Figure IX – **Adjusted mean predictions of the personalisation ratio**



Reading Note: (A) On working days, the predicted personalisation ratio for women is 83%. (B) For women who do not have a child aged under 7, the predicted personalisation ratio is 76%.
Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 4,300 individuals belonging to the *male early riser* and *female early riser* groups.

the activities performed by women, but does not have any significant effect on men (Figure IX-B), which reinforces the gender inequalities in the composition of desynchronised activities.

The composition of desynchronisation within couples in which one of the partners gets up significantly earlier than the other therefore reflects the gender inequalities in the division of work within couples. Although men and women get up earlier to go to work, women also get up earlier to complete domestic tasks.

* *
*

Highly synchronised across the French population as a whole, sleep tends to be even more synchronised within couples. Nevertheless, not everybody enjoys the same degree of freedom when it comes to harmonising their schedules and the typology of conjugal sleep organisation allows us to highlight ways in which partners' sleep is mismatched. Synchronised nights are contrasted with more discordant ways of organising sleep, in which one partner goes to bed later or gets up earlier, or those that are fully discordant, where one partner sleeps at night and the other during the day.

Among couples, professional activity is the main reason for unequal opportunities to synchronise the partners' sleep schedules. By imposing its schedule, work restricts the ability of individuals to organise their sleep. At the level of the couple, where the discordance in the working days of the partners is too great, this results in the desynchronisation of sleep. As a result, the desynchronisation of sleep schedules reflects that of working hours, which offers a new perspective on the individual inequalities in the economic system at the level of couples.

Within couples, the discordance in sleep schedules also reflects inequalities in the division of paid work and domestic tasks. Men and women do not perform the same activities while their partner is sleeping: more time devoted to household chores

for women and more time spent at work for men. The differences in the way men and women use their time is also reflected in the organisation of sleep schedules at the individual level.

However, it is inequalities in labour market positions that produce the greatest degree of inequality in the synchronisation of sleep at the level of couples. The more favourable a person's employment situation is, the more opportunity they have to match their working hours to those of their partner, and the greater the opportunity for the couple to synchronise their sleep. □

Link to Online Appendices: https://www.insee.fr/en/statistiques/fichier/5347218/ES-522-523_Rauch_Online_Appendices.pdf

BIBLIOGRAPHY

Amossé, T. (2019). Rénovation de la PCS - 2018-2019 – Propositions du Groupe de travail du Cnis – Document provisoire présenté lors de la réunion de la Commission Emploi Revenu. https://www.cnis.fr/wp-content/uploads/2019/01/DPR_2019_1re-reunion_ComEmploi_R%C3%A9novation-PCS-2018-2019_Note-d%C3%A9taill%C3%A9e.pdf

Aubert, V. & White, H. (1959a). Sleep: A Sociological Interpretation. I. *Acta Sociologica*, 4(2), 46–54. https://doi.org/10.1177/000169935900400207

Aubert, V. & White, H. (1959b). Sleep: A Sociological Interpretation. II. *Acta Sociologica*, 4(3), 1–16. https://doi.org/10.1177/000169935900400301

Biddle, J. E. & Hamermesh, D. S. (1990). Sleep and the Allocation of Time. *Journal of Political Economy*, 98(5, Part 1), 922–943. https://doi.org/10.1086/261713

Brousse, C. (2015). La vie quotidienne en France depuis 1974. Les enseignements de l'enquête Emploi du temps. *Économie et statistique*, 478(1), 79–117. https://doi.org/10.3406/estat.2015.10559

Bué, J. (2005). Travail de nuit et du soir depuis dix ans: une progression plus rapide pour les femmes que pour les hommes. *Premières informations et premières synthèses*, 40(2). http://www.epsilon.insee.fr:80/jspui/handle/1/3985

Burgard, S. A. & Ailshire, J. A. (2013). Gender and Time for Sleep among U.S. Adults. *American Sociological Review*, 78(1), 51–69. https://doi.org/10.1177/0003122412472048

Cha, S.-E. & Eun, K.-S. (2014). Gender Difference in Sleep Problems: Focused on Time Use in Daily Life of Korea. *Social Indicators Research*, 119(3), 1447–1465. https://doi.org/10.1007/s11205-013-0550-1

Cha, S.-E. & Eun, K.-S. (2018). Convergence in Sleep Time Accomplished? Gender Gap in Sleep Time for Middle-Aged Adults in Korea. *International Journal of Environmental Research and Public Health*, 15(4), 803. https://doi.org/10.3390/ijerph15040803

Chatzitheochari, S. & Arber, S. (2009). Lack of sleep, work and the long hours culture: Evidence from the UK Time Use Survey. *Work, Employment and Society*, 23(1), 30–48. https://doi.org/10.1177/0950017008099776

Coveney, C. M. (2014). Managing sleep and wakefulness in a 24-hour world. *Sociology of Health & Illness*, 36(1), 123–136. https://doi.org/10.1111/1467-9566.12046

Daguet, F. & Niel, X. (2010). Vivre en couple. La proportion de jeunes en couple se stabilise. *Insee Première*, (1281).

de Saint Pol, T. (2006). Le dîner des français : Un synchronisme alimentaire qui se maintient. *Économie et statistique*, 400(1), 45–69. https://doi.org/10.3406/estat.2006.7111

Degenne, A., Lebeaux, M.-O. & Marry, C. (2002). Les usages du temps : Cumuls d'activités et rythmes de vie. *Économie et Statistique*, 352(1), 81–99. https://doi.org/10.3406/estat.2002.7394

Emploi du temps (EDT) – 1985-1986, Insee (producteur), ADISP (diffuseur)

Emploi du temps (EDT) – 1998-1999, Insee (producteur), ADISP (diffuseur)

Emploi du temps, (EDT) – 2009-2010, Insee (producteur), ADISP (diffuseur)

Fisher, K. & Robinson, J. P. (2010). Daily Routines in 22 Countries: Diary Evidence of Average Daily Time Spent in Thirty Activities. Centre for Time Use Research.

Hamermesh, D. S. (2002). Timing, togetherness and time windfalls. *Journal of Population Economics*, 15(4), 601–623.

Hislop, J. & Arber, S. (2003). Sleepers Wake! the Gendered Nature of Sleep Disruption among Mid-life Women. *Sociology*, 37(4), 695–711. https://doi.org/10.1177/00380385030374004

Insee (2017). Enquête Emploi du temps et Décisions dans les couples 2009-2010 – Dictionnaire des codes.

Lesnard, L. (2008). Off-Scheduling within Dual-Earner Couples: An Unequal and Negative Externality for Family Time. *American Journal of Sociology*, 114(2), 447–490. https://doi.org/10.1086/590648

Lesnard, L. (2010). Setting Cost in Optimal Matching to Uncover Contemporaneous Socio-Temporal Patterns. *Sociological Methods & Research*, 38(3), 389–419. https://doi.org/10.1177/0049124110362526

Maume, D. J., Hewitt, B. & Ruppanner, L. (2018). Gender Equality and Restless Sleep Among Partnered Europeans: Gender Equality and Restless Sleep. *Journal of Marriage and Family*, 80(4), 1040–1058. https://doi.org/10.1111/jomf.12488

Maume, D. J., Sebastian, R. A. & Bardo, A. R. (2009). Gender Differences in Sleep Disruption among Retail Food Workers. *American Sociological Review*, 74(6), 989–1007. https://doi.org/10.1177/000312240907400607

Maume, D. J., Sebastian, R. A. & Bardo, A. R. (2010). Gender, Work-Family Responsibilities, and Sleep. *Gender & Society*, 24(6), 746–768. https://doi.org/10.1177/0891243210386949

Mauss, M. (1936). Les techniques du corps. *Journal de psychologie*, 32(3-4), 271–293.

Meadows, R., Arber, S., Venn, S. & Hislop, J. (2008). Engaging with sleep: Male definitions, understandings and attitudes. *Sociology of Health & Illness*, 30(5), 696–710. https://doi.org/10.1111/j.1467-9566.2008.01088.x

Méda, D. (2001). Centralité du travail, plein emploi de qualité et développement humain. *Cités*, 4(8), 21–33.

Ricroch, L. (2012). En 25 ans, le temps passé à dormir la nuit a diminué de 18 minutes. *In: Insee Références. France, portrait social 2012* (107–118).

Robinson, J. P. & Michelson, W. (2010). Sleep as a victim of the « time crunch » – A multinational analysis. *Electronic International Journal of Time Use Research*, 7(1), 61–72. https://doi.org/10.13085/eIJTUR.7.1.61-72

Schwartz, B. (1970). Notes on the Sociology of Sleep. *The Sociological Quarterly*, 11(4), 485–499. https://doi.org/10.1111/j.1533-8525.1970.tb01320.x

Taylor, B. (1993). Unconsciousness and society: The sociology of sleep. *International Journal of Politics, Culture and Society*, 6(3), 463–471. https://doi.org/10.1007/BF01415970

Venn, S., Arber, S., Meadows, R. & Hislop, J. (2008). The fourth shift: Exploring the gendered nature of sleep disruption among couples with children. *The British Journal of Sociology*, 59(1), 79–97. https://doi.org/10.1111/j.1468-4446.2007.00183.x

Williams, S. J. (2002). Sleep and Health: Sociological reflections on the dormant society. *Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine*, 6(2), 173–200. https://doi.org/10.1177/136345930200600203

Léger, D., Giordanella, J.-P., Frioux, D., Hardy, A., Hebel, P., Fatoux, F. & de Saint Pol, T. (2016). *Retrouver le sommeil, une affaire publique*. Terra Nova.

APPENDIX 1

PROFESSIONS AND SOCIO-PROFESSIONAL CATEGORIES AT THE COUPLE LEVEL

In order to build our nomenclature for the PCS at the level of couples, we draw upon that used for the household PCS, established by the Cnis working group on the revision of the classification of occupations and socio-professional categories (PCS, 2018-2019) (Amossé, 2019). Contrary to the nomenclature established by the working group, retired persons are not included in their former social group, as we wish to study the organisation of sleep in connection with the specific features of the professional situation of couples.

Table A1 – **Couple's social category (PCS)**

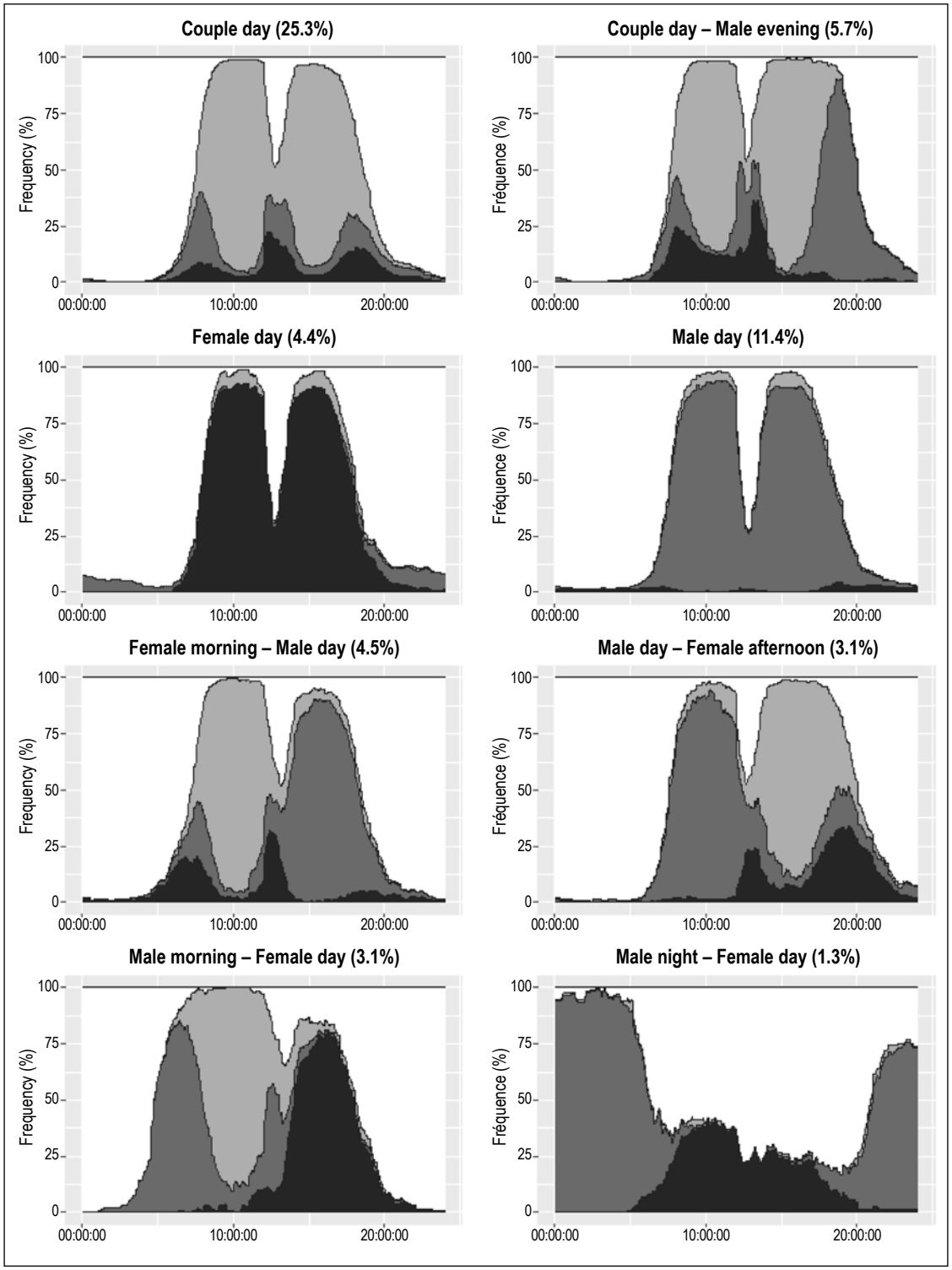
Couple's level PCS	Partners' PCS
Executive	Both partners executives Executive and middle-management employee
Middle-management employee and executive	Executive and white or blue-collar worker Executive and unemployed[a] Middle-management employee or executive and self-employed Both middle-management employees
Couples with a dominant white-collar worker and middle-management employee	Middle-management employee and white or blue-collar worker Middle-management employee and unemployed[a] Both white-collar workers
Couples with a dominant self-employed worker	Both self-employed workers or self-employed and unemployed[a] Self-employed and white or blue-collar worker
Couples with a dominant blue-collar worker	Blue-collar worker and white-collar worker Both blue-collar workers
White or blue-collar worker and unemployed or comparable unemployed	White-collar worker and unemployed[a] Blue-collar worker and unemployed[a] Both unemployed[b]
Retired couples	Retired couples

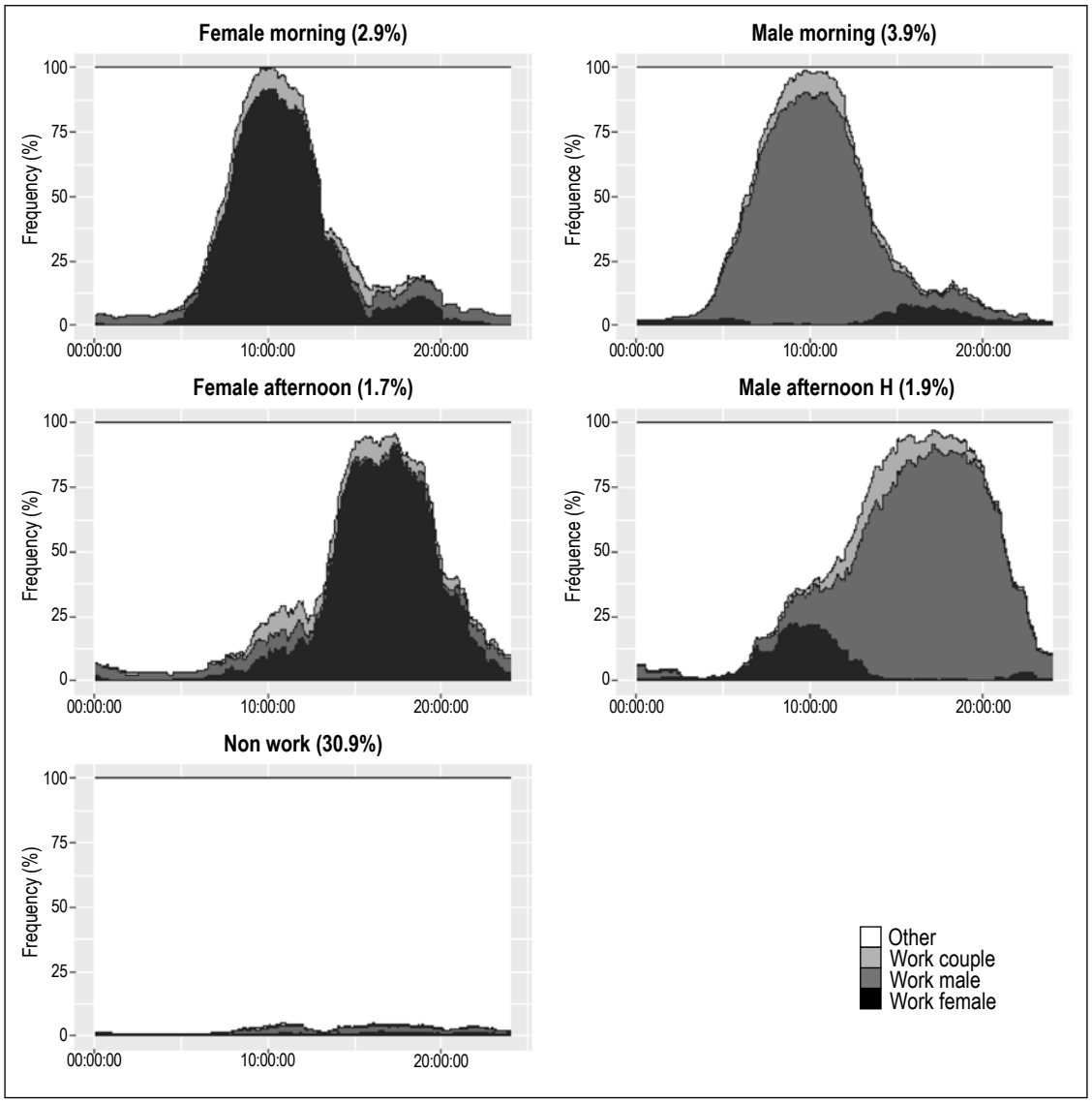
(a) unemployed or retired
(b) under 60 years of age

APPENDIX 2

TYPOLOGY OF WORKED DAYS AND ADDITIONAL STATISTICS

Figure A2– **Typology of worked days within economically active* couples**





* Including students
Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 8,762 heterosexual couples, Metropolitan France.

Table A2-1 – **Working hours according to types of sleep organisation**

	Median work start time		Median work end time	
	Women	Men	Women	Men
Long synchro nights	09:05	08:55	18:12	18:40
Short synchro nights	08:00	07:35	17:50	18:20
Night owl partners	14:13	12:32	20:00	20:00
Female early riser	07:50	11:35	17:40	20:00
Male early riser	09:05	06:50	18:05	17:40
Male night owl	08:05	08:05	17:40	19:08
Male daytime sleep	08:05	20:49	17:20	05:55
Female daytime and poor sleep	20:12	08:05	07:45	18:30

Reading Note: Within the *short synchro nights* group, half of women start working at 8:00.
Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 5,691 women and 7,812 men who worked on the day of the survey, Metropolitan France.

Table A2-2 – **Distribution of the types of organisation according to the degree of freedom to set their own hours (%)**

	Long synchro nights	Short synchro nights	Night owl partners	Female early riser	Male early riser	Male night owl	Male daytime sleep	Female daytime and poor sleep	Total
Free for both	20.6	65.0	0.6	0.6	6.7	5.3	0.4	0.7	100
Imposed for one, free for the other	15.0	59.7	0.6	2.2	13.6	6.4	1.5	1.1	100
Imposed for both	11.2	60.3	0.3	2.6	16.3	5.2	2.6	1.5	100
Total	14.2	61.1	0.5	2.1	13.6	5.6	1.8	1.2	100

Reading Note: 65% of couples who are free to determine their own working hours belong to the *short synchro nights* group.
Sources and Coverage: Insee, Time Use Surveys 1985-1986, 1998-1999, 2009-2010; 4,127 heterosexual couples within which both partners worked on the day of the survey, Metropolitan France.

N° 520-521 (2020) – **VARIA**

N° 517-518-519 (2020) – **AU-DELÀ ET AUTOUR DU PIB : QUESTIONS A LA COMPTABILITÉ NATIONALE / *BEYOND AND AROUND GDP: QUESTIONS TO NATIONAL ACCOUNTING***

N° 514-515-516 (2020) – **JEUNES ET TRANSITIONS VERS L'ÂGE ADULTE / *YOUTH AND TRANSITIONS TO ADULTHOOD***

• Le soutien financier aux jeunes par les transferts sociaux et fiscaux – Scénarios de défamilialisation / *Financial Support for Young Adults Through Tax and Social Transfers – Defamilialisation Scenarios* – Adélaïde Favrat, Vincent Lignon & Muriel Pucci

• Argent et sentiments. Une interprétation des déterminants de l'aide financière des parents aux jeunes adultes / *Money and Feelings: An Interpretation of the Factors of Financial Support from Parents to Young Adults* – Marie-Clémence Le Pape, Mickaël Portela & Élise Tenret

• Les décisions des jeunes dans la transition vers la vie adulte en France : l'influence de facteurs familiaux / *Young People's Decisions in the Transition to Adulthood in France: Influence of Family Factors* – Audrey Rose Menard & Vincent Vergnat

• À quoi rêvent les jeunes salariés ? Qualité du travail, aspirations professionnelles et souhaits de mobilité des moins de 30 ans / *What do Young Employees Dream of? Quality of Work, Career Aspirations and Desire for Mobility among the Under 30s* – Christine Fournier, Marion Lambert & Isabelle Marion-Vernoux

• Risque d'exclusion sociale et ressources des jeunes NEET / *Risk of Social Exclusion and Resources of Young NEETs* – Claire Bonnard, Jean-Francois Giret & Yann Kossi

• Inégalités des chances dans le recours aux soins des jeunes adultes en France / *Inequalities of Opportunity in the Use of Health Care by Young Adults in France* – Doriane Mignon & Florence Jusot

• Les opinions des jeunes adultes sur le rôle social de l'État ont-elles changé depuis la crise de 2008 ? / *Did the 2008 Crisis Change Young Adults' Views on the Social Role of the State?* – Adrien Papuchon

N° 513 (2019) – **VARIA**

• Les supporters français de football sont-ils sensibles à l'incertitude du résultat ? / *Are French Football Fans Sensitive to Outcome Uncertainty?* – Luc Arrondel & Richard Duhautois

• Les discriminations dans l'accès au logement en France : un testing sur les aires urbaines métropolitaines / *Discriminations in Access to Housing: A Test on Urban Areas in Metropolitan France* – Julie Le Gallo, Yannick L'Horty, Loïc du Parquet & Pascale Petit

• Les liens entre taux d'épargne, revenu et incertitude : une analyse à partir de l'enquête Budget de famille 2011 / *The Links between Saving Rates, Income and Uncertainty: An Analysis based on the 2011 Household Budget Survey* – Céline Antonin

• Quatre décennies d'achats alimentaires : évolutions des inégalités de qualité nutritionnelle en France, 1971-2010 / *Four Decades of Household Food Purchases: Changes in Inequalities of Nutritional Quality in France, 1971-2010* – France Caillavet, Nicole Darmon, Flavie Létoile & Véronique Nichèle

• L'élasticité-prix de la demande d'électricité en France / *Price Elasticity of Electricity Demand in France* – Stéphane Auray, Vincenzo Caponi & Benoît Ravel

N° 510-511-512 (2019) – **NUMÉRO SPÉCIAL 50ème ANNIVERSAIRE / *50th ANNIVERSARY SPECIAL ISSUE***

◦ Éditorial / *Editorial* – Jean-Luc Tavernier

◦ Cinquante ans de résumés d'Economie et Statistique / *Fifty Years of Abstracts in the Journal* Economie et Statistique – Julie Djiriguian & François Sémécurbe

◦ Préface – Les temps ont changé / *Preface – Times Have Changed* – Daniel Cohen

• Évolutions de la part du travail dans les pays de l'OCDE au cours des deux dernières décennies / *Labour Share Developments in OECD Countries Over the Past Two Decades* – Mathilde Pak, Pierre-Alain Pionnier & Cyrille Schwellnus

• La part du travail sur le long terme : un déclin ? / *The Labor Share in the Long Term: A Decline?* – Gilbert Cette, Lorraine Koehl & Thomas Philippon

• Croissance économique et pouvoir d'achat des ménages en France : les principales évolutions depuis 1960 / *Economic Growth and Household Purchasing Power in France: Key Changes Since 1960* – Didier Blanchet & Fabrice Lenseigne

• Inégalités de revenus et de richesse en France : évolutions et liens sur longue période / *Income and Wealth Inequality in France: Developments and Links over the Long Term* – Bertrand Garbinti & Jonathan Goupille-Lebret

• Les grandes transformations du marché du travail en France depuis le début des années 1960 / *The Major Transformations of the French Labour Market Since the Early 1960s* – Olivier Marchand & Claude Minni

• Égalité professionnelle entre les femmes et les hommes en France : une lente convergence freinée par les maternités / *Gender Equality on the Labour Market in France: A Slow Convergence Hampered by Motherhood* – Dominique Meurs & Pierre Pora

• Quarante ans d'évolution de l'offre et de la demande de travail par qualification – Progrès technique, coût du travail et transformation sociale / *Forty Years of Change in Labour Supply and Demand by Skill Level – Technical Progress, Labour Costs and Social Change* – Dominique Goux & Éric Maurin

• Intelligence artificielle, croissance et emploi : le rôle des politiques / *Artificial Intelligence, Growth and Employment: The Role of Policy* – Philippe Aghion, Céline Antonin & Simon Bunel

• Quelle valeur donner à l'action pour le climat ? / *What Value Do We Attach to Climate Action?* – Alain Quinet

• Inférence causale et évaluation d'impact / *Causal Inference and Impact Evaluation* – Denis Fougère & Nicolas Jacquemet

• L'émergence et la consolidation des modèles de microsimulation en France / *The Emergence and Consolidation of Microsimulation Methods in France* – François Legendre

Economie et Statistique / Economics and Statistics

Objectifs généraux de la revue

Economie et Statistique / Economics and Statistics publie des articles traitant de tous les phénomènes économiques et sociaux, au niveau micro ou macro, s'appuyant sur les données de la statistique publique ou d'autres sources. Une attention particulière est portée à la qualité de la démarche statistique et à la rigueur des concepts mobilisés dans l'analyse. Pour répondre aux objectifs de la revue, les principaux messages des articles et leurs limites éventuelles doivent être formulés dans des termes accessibles à un public qui n'est pas nécessairement spécialiste du sujet de l'article.

Soumissions

Les propositions d'articles, en français ou en anglais, doivent être adressées à la rédaction de la revue (redaction-ecostat@insee.fr), en format MS-Word. Il doit s'agir de travaux originaux, qui ne sont pas soumis en parallèle à une autre revue. Un article standard fait environ 11 000 mots en français, y compris encadrés, tableaux, figures, annexes et bibliographie, non compris éventuels compléments en ligne. Aucune proposition initiale de plus de 12 500 mots (11 000 pour les soumissions en anglais) ne sera examinée.

La soumission doit comporter deux fichiers distincts :

- Un fichier d'une page indiquant : le titre de l'article ; le prénom et nom, les affiliations (maximum deux), l'adresse e-mail et postale de chaque auteur ; un résumé de 160 mots maximum (soit environ 1 050 signes espaces compris) qui doit présenter très brièvement la problématique, indiquer la source et donner les principaux axes et conclusions de la recherche ; les codes JEL et quelques mots-clés ; d'éventuels remerciements.
- Un fichier anonymisé du manuscrit complet (texte, illustrations, bibliographie, éventuelles annexes) indiquant en première page uniquement le titre, le résumé, les codes JEL et les mots-clés.

Les propositions retenues sont évaluées par deux à trois rapporteurs (procédure en « double-aveugle »). Les articles acceptés pour publication devront être mis en forme suivant les consignes aux auteurs (accessibles sur https://www.insee.fr/fr/information/2410168). Ils pourront faire l'objet d'un travail éditorial visant à améliorer leur lisibilité et leur présentation formelle.

Publication

Les articles sont publiés en français dans l'édition papier et simultanément en français et en anglais dans l'édition électronique. Celle-ci est disponible, en accès libre, sur le site de l'Insee, le jour même de la publication ; cette mise en ligne immédiate et gratuite donne aux articles une grande visibilité. La revue est par ailleurs accessible sur le portail francophone Persée, et référencée sur le site international Repec et dans la base EconLit.

Main objectives of the journal

Economie et Statistique / Economics and Statistics publishes articles covering any micro- or macro- economic or sociological topic, either using data from public statistics or other sources. Particular attention is paid to rigor in the statistical approach and clarity in the concepts and analyses. In order to meet the journal aims, the main conclusions of the articles, as well as possible limitations, should be written to be accessible to an audience not necessarily specialist of the topic.

Submissions

Manuscripts can be submitted either in French or in English; they should be sent to the editorial team (redaction-ecostat@insee.fr), in MS-Word format. The manuscript must be original work and not submitted at the same time to any other journal. The standard length of an article is of about 10,000 words (including boxes if any, tables and figures, appendices, list of references, but not counting online complements if any). Manuscripts of more than 11,000 words will not be considered.

Submissions must include two separate files:

- A one-page file providing: the title of the article; the first name, name, affiliation-s (at most two), e-mail et postal addresses of each author; an abstract of maximum 160 words (about 1050 characters including spaces), briefly presenting the question(s), data and methodology, and the main conclusions; JEL codes and a few keywords; acknowledgements.
- An anonymised manuscript (including the main text, illustrations, bibliography and appendices if any), mentioning only the title, abstract, JEL codes and keywords on the front page.

Proposals that meet the journal objectives are reviewed by two to three referees ("double-blind" review). The articles accepted for publication will have to be presented according to the guidelines for authors (available at https://www.insee.fr/en/information/2591257). They may be subject to editorial work aimed at improving their readability and formal presentation.

Publication

The articles are published in French in the printed edition, and simultaneously in French and in English in the online edition. The online issue is available, in open access, on the Insee website the day of its publication; this immediate and free online availability gives the articles a high visibility. The journal is also available online on the French portal Persée, and indexed in Repec and EconLit.

N° 522-523 - 2021

Economie ET Statistique

Economics AND Statistics

Prochain numéro / Next Issue

Varia

ISBN 978-2-11-162325-5 - ISSN 0336-1454 - ECO 522-523
Parution avril 2021 - PRIX : 17,20 €