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Edging towards a national minimum wage? Initial context, recent developments and the road ahead

Louis N. Christofides*

Professor Emeritus, University of Cyprus and University Professor Emeritus, University of Guelph.

Abstract

In Cyprus, a *national* minimum wage (MW) does not currently exist. Legally binding wage minima exist in the *non-union sector* and collectively bargained 'indicative' starting salaries provide (non-binding) benchmarks for the occupations of the *union sector*. However, a political momentum has developed towards the adoption of a national MW. A recent and unusual (trilateral) agreement for the *unionised* Hotel sector specifies binding MWs for 19 low-income occupations. The legal mechanism enforcing these minima is the one currently used in the *non-union sector* (a Ministerial Order). The Hotel agreement involves the government in micromanaging the occupational wage structure in the Hotel sector. But it also smooths the way towards the adoption of a national MW: it raises the lowest monthly salary in Hotels to the prevailing MW level in the non-union sector (EUR 870 pm) and shifts a large mass of Hotel employees from the left tail of the wage distribution to their new (January 2020) minima. This development leaves employees in restaurants, a large group with special needs, to be brought under the umbrella of a possible national MW. The Hotel agreement may ease-in a future national MW, but its philosophy may prove hard to retract. One large union wants this mechanism applied to the multitude of 'indicative' wage minima in the union sector, in effect giving some aspects of all CB agreements legal force. This paper considers possible architectures and levels for a possible national MW. It also discusses the labour market implications of and likely reactions to the Hotel agreement and to a possible national MW.

Keywords: unions, wage determination, national minimum wage, Cyprus

1. Introduction and background to the momentum for a national minimum wage in Cyprus

It is a standard phrase in economics that, in the context of a competitive market, the *imposition* of a price other than the equilibrium one will produce outcomes 'on the short side of the market': an 'effective' (i.e., above-equilibrium) minimum price will produce on outcome on the demand curve while an 'effective' (i.e., below equilibrium) maximum price will produce an outcome on the supply curve. In the context of a competitive labour market and an effective minimum wage (MW), the outcome on the labour demand curve will have features which will depend on its

*Corresponding Author Address: Department of Economics, University of Cyprus, P.O. Box 20537, 1678 Nicosia, Cyprus. Email: louis.christofides@ucy.ac.cy.

elasticity: employment will decline only marginally and the total earnings of workers will increase (relative to the competitive outcome) if the labour demand curve is inelastic, but employment and earnings will both decrease if it is elastic. Since a usual motive for minimum wages is the desire to improve the total earnings of workers, the possibility of reduced employment *and* total earnings has given pause to those contemplating the introduction of a minimum wage.

This analysis is normal fare for all first-year students. However, the path-breaking work of Card (1992), Card and Krueger (1995), and of many others has shown that, under certain conditions, a MW may even increase employment. The work of Manning (2003), reviewed in Kuhn (2004), has provided theoretical underpinnings in this direction: When a monopsonist pays a wage rate below the competitive one, a MW above the monopsony wage but below the competitive one will increase employment along the labour supply curve. Other labour market theorists have also addressed the effects of minimum wages in their models. Despite the nuancing of the classical competitive position about the effects of a MW, recent surveys, such as Brown and Hamermesh (2019) and Neumark (2018), report some negative employment effects which are sometimes statistically significant. Less is known about the introduction of, or large increases in, the level of MWs,[1] much less about the introduction of a *national* MW.

D. Card, in a press statement following his award of the 2021 Nobel Memorial Prize in Economics, in effect stressed that the main take-away of recent developments in this area is that the impact of the introduction or extension of a MW needs to be considered more broadly than for just its employment effects. The literature now explores questions such as: what is the labour market context where a MW is introduced (competitive or monopsonistic), who does the MW apply to (high or low-wage workers), who benefits and who loses (the firm, its consuming clients, workers themselves), what are the direct and indirect effects (including those on all prices and other wages), is this the best way to redistribute income to labour, what is the role of the social security context where a MW is introduced, and what are its overall welfare effects? The last question is particularly challenging. Ashenfelter et al. (2021) exemplifies the complexity of the issues involving the MW. Considering the recent momentum in Cyprus towards a national MW, it would appear useful to delve into some of these issues further, hopefully providing food for thought. Indeed, very little is known about the operation and effects of the MW in Cyprus. The much-appealed-to study by the International Labour Organisation (ILO), which appears to be guiding policy formation, is not available. The broader appreciation of the effects of the MW and the swing of the pendulum away from the singular focus on employment have prompted one analyst to characterise the MW as a "… 'risky' but potentially 'profitable' investment in redistribution" (Freeman (1996, p. 639).

A variety of national MW regimes exist in most European Union countries and only six (Austria, Cyprus, Denmark, Finland, Italy and Sweden) do not have a national, statutory, MW system in effect. The European Union adopted the European Pillar of Social Rights (EPSR) in 2017 and an Action Plan (2021) which provides that "Adequate minimum wages shall be ensured, in a way that provide for the satisfaction of the needs of the worker and his/her family in the light of national economic and social conditions, whilst safeguarding access to employment and incentives to seek work. In-work poverty shall be prevented." (item 6b, p.44, EPSR Action Plan

[1] See, however, Caselli et al. (2021).

(2021)).[2] The general dynamic for convergence in the EU and the wide disparities in per capita incomes generate political pressures for a MW. The President of Cyprus in his electoral manifesto[3] suggests that a national MW system will be discussed with the view to adoption when conditions of full employment return. Discussions at the Labour Advisory Board (consisting only of members of the Ministry of Labour, Welfare and Social Insurance (MLWSI), representatives of three trade unions (DEOK, PEO and SEK), and two employer organisations (KEBE and OEB)) are proceeding, though very little is known about their plans.

The aim of this paper is to review the existing architecture of the MW in Cyprus, to examine the recent application of the statutory MW in the unionised Hotel sector, to place these in the context of the collective bargaining and social security systems that currently run parallel with the statutory MW, and to consider how a *national* MW might be superimposed on the current wage determination process. The paper begins by reviewing the wage determination process in the unionised sector (section 2.1), outlines the existing application of the statutory MW to the non-union sector (section 2.2), describes the 2020 Hotel sector modification to this setup which blurs the distinction between the union and non-union sectors (section 2.3), considers what an appropriate architecture and level of a national MW might be (section 2.4), explores the wage distribution context within which a national MW might be introduced (section 2.5), and refers briefly to relevant items in the MW literature as they might pertain to Cyprus (section 2.6). A summarising and concluding discussion (section 3) overviews how a national minimum wage may be implemented and problems that might emerge in the process.

2. The wage-setting process in the union and non-union sectors

2.1 The union sector

Collective bargaining (CB) at the national level does not exist in Cyprus. Wage setting takes place in a complex pattern of institutional interactions at the sectoral, but also the individual-firm level. The 1977 Industrial Relations Code adopted the main ILO conventions, and it has circumscribed CB in Cyprus since then. Remuneration and other employment issues in the private, semi-private, and local authority sectors are set through CB between employer and worker organisations,[4] mainly at the industry/sector, but also at the enterprise level. A notable example of the latter are banks, which negotiate individually with ETYK; this union represents bank employees (surprisingly, including the employees of the Central Bank of Cyprus who are supposed to oversee the commercial banks). Wages in the public sector are set by law, following consultations between unions and the government. Special provisions regarding work-stoppages are in force regarding employees in essential services such as the police, the fire departments and detention centres. CB agreements are not legally binding, but they are generally adhered to. The Cyprus Crisis of 2013-2016 and the subsequent pandemic produced deviations from agreed CB terms and unions are keen to re-establish the primacy of CB. Employment protection legislation

[2]The nuanced proviso of continued access to employment and the significance of a member state's social context should be noted.

[3] "Στόχος μας, μετά και την επίτευξη συνθηκών πλήρους απασχόλησης, η έναρξη διαλόγου για τη θέσπιση του εθνικού κατώτατου μισθού, σε όλα τα επαγγέλματα." See Αναστασιάδης (2018).

[4] Two employer organisations (KEBE and OEB) represent a large number of firms, which employ about 62 % of the workforce. Seven large and a number of smaller unions represent workers with a coverage of about 45 % - see European Commission (2016).

complements CB agreements and may ensure that, in the case of private contracts which comply with CB terms, these have legal standing.

The sectoral CB agreements in the unionised sector specify 'indicative minimum starting wages' for a very detailed list of (about 180) occupations. Table 1 summarises these starting salaries. In the case of Agriculture/Animal Husbandry, employment typically involves accommodation and food, making the figures reported in Table 1 unrepresentative of the total value of the employment package. The Hotel and the Hospitality sectors[5] contain the lowest starting salaries at EUR 695 pm and EUR 669 pm respectively. Hotels pay their Head Cooks the maximum starting salary of EUR 1991 pm. In other sectors, the lowest starting salaries are generally around EUR 1000 pm and may approach twice that amount at their peak. It should be noted that these figures are 'indicative' and may not be adhered to by individual employers because CB agreements are not legally binding. Some unions are actively engaged in securing legal recognition for at least some features of CB agreements (e.g. wages). This is an important point in what follows.

TABLE 1

Indicative starting salaries in sectoral collective bargaining agreements[a,b]

(EUR per month, includes historical COLA)

Sector	Lowest Level/Highest Level	Lowest/Highest Paid
Construction	General duty/Skilled	1 502/1 777
Brick Factories	Assistants/Skilled	1 489/1 700
Woodworking	Apprentices aged 16+/ Skilled; Sculptor	1 011/1 550
Metal Works	Unskilled/Specialised	1 308/1 534
Imp. Mech., Vehicles	Apprentice "A"/Specialised	1 203/1 880
Electrical Installations	Newly hired 16+/ University Graduates	1 213/1 611
Clinics	Assistants/Nurse Level 1	897/1 205
Old Age Homes	Carer; Nurse	1 080/1 080
Agriculture/Animal Husbandry	Unskilled/Skilled	455/767
Printing	General duties/Printers	1 146/1 370
Hotels	Assistant Waiter/Head Cook	695/1 991
Hospitality	Kitchen Assistant/Chef	669/1 598

Source: MLWSI and Christofides (2019)

Notes: [a] Figures do not include the latest, small, amount of Cost of Living Allowance (COLA). Sectoral agreements may include other employment terms such as

(i) hours of work (mostly 38 per week except in Agriculture/Animal Husbandry and Hospitality, where they are 40)

(ii) whether a 13th month salary is offered

(iii) the number of working days per week (5 to 6), and

(iv) the number of recognised public holidays.

[b] In the very lengthy table available from MLWSI, about 180 categories are distinguished. The present table presents a summary picture.

[5] The Hotel sector deserves special mention because of its size, but also because it has been substantially affected by recent developments that are reviewed below. The Hospitality sector employs many third country workers, a fact which raises special issues which are discussed in section 3.

2.2 The non-union sector

In the case of occupations where workers are not unionised, legislation governs the MW, hours of work, and annual leave for workers. The Labour Advisory Board and other ad hoc groups of social partners would be consulted if changes in the level of the MW, or its architecture, were contemplated. The statutory nature of any consequent action takes the form of a Council of Ministers Order. MLWSI (2012) describes the pre-2020 terms and coverage of the relevant legislation on its webpage.[6] Please note that the first link given in the References, which contained the English quotation in footnote 6, does not currently function. The second link in the References leads to a 'Q and A' section of the MLWSI web page; this still describes, in Greek, the provisions in footnote 6. The complete law is also available, in Greek, at: https://www.sek.org.cy/images/pdf/nomothesies/Minimum_Wage_2012_doc.pdf

It should be stressed that, in Cyprus, the term 'MW' is generally understood to refer to the value of EUR 870 per month (pm), or EUR 924 pm for tenure over six months, or to the hourly wage rates in footnote 6, and not to the CB minima in Table 1. The former MWs are legally enforceable, while the latter are not (unless built into an explicit contract or characterised by continuous employment). Cleaners and security guards are paid by the hour. The MW of EUR 870 pm (or EUR 924 pm after six months) and the monthly minima have been fixed for several years. The Cyprus crisis brought in substantial wage cuts in the private sector but workers in this sector covered by the MW who were still employed did well relative to other private sector workers. The Memorandum of Understanding of 2013 and its later versions did not require any adjustments to the MW structure. In the public and semi-public sectors, the lowest-paid were largely protected from wage cuts, though some were subject to tax-like charges that reduced their net pay.

2.3 New MW developments in the Hotel sector

Having described how the MW has hitherto been applied to the non-union groups in footnote 6, mention must now be made of a significant, recent, development which has changed the architecture of the MW and has blurred the separation between CB outcomes in the unionised sector and the MW arrangements in the non-union sector.

An agreement was reached between MLWSI and social partners to specify minimum wages and hours of work for 19 low-income occupations in the Hotel sector (which is unionised). A Council

[6] "The Minimum Wage Order of 2012…is applicable for…shop assistants, clerks, child-care workers (assistant baby and child minders), [and] personal care workers (nursing assistants). Furthermore, the Order provides for a minimum hourly rate of pay for security guards, and cleaners of business/corporate premises.
The minimum monthly wage upon recruitment was revised to EUR 870, while the minimum monthly wage for employees who have completed a six-month period of employment at the same employer was revised to EUR 924.
The minimum wage for security guards was revised to an hourly rate of EUR 4.90 and upon completion of a six-month period of employment at the same employer is increased to EUR 5.20. The hourly rate of pay for newly recruited cleaners is EUR 4.55 and upon completing six months of employment at the same employer is increased to EUR 4.84.
It should be noted that the normal working hours of shop assistants…must not exceed 38 hours weekly and 8 hours daily, whilst for clerks the working hours should not exceed 44 hours in total per week (including any overtime) or 8 hours daily (normal working hours are usually 38 to 40 hours based on normal practice and agreement with each employer." MLWSI (2012).
Six months after their application, asylum seekers may work in restricted occupations, earning a minimum of EUR 425 pm. This provision is not part of the MW legislation but it derives from separate arrangements for refugee status claimants.

of Ministers Order imposing these provisions was issued on January 8, 2020 (Ε.Ε. Παρ. III(I), Αρ. 5201, 10.1. 2020, Αριθμός 6), putting the 19 occupations in the same legal position as those mentioned in footnote 6. In effect, the Council of Ministers Order makes the agreed minimum salaries and hours of work in the Hotel sector legally binding. Employers, who have traditionally opposed making the provisions of CB agreements legally binding, were persuaded to go along with these developments on the grounds that they secure a 'level playing field' and avoid undue and illicit competition among hoteliers. Some unions have already argued that the 'indicative' minima, described for sectors other than Hotels in Table 1, should come under the same statutory umbrella. Taken literally, this would involve the oversight and implementation of wage minima in the entire economy, a task that characterises centrally planned economies and well-beyond current MLWSI capabilities and resources.

An alternative interpretation is that the state could defer to the judicial system the task of enforcing contractual obligations. However, the judicial system is currently already overwhelmed and struggling to deal with backlogs that have made Cyprus rank extremely low in international comparisons, preventing foreign direct investment. Radical judicial reforms are currently being discussed and it would appear, at the very least, premature to consider a massive expansion of its workload. The Hotel innovation may come to haunt the authorities, if unions insist on this extension. The 'shoehorn' that is facilitating a move to a national MW may be hard to 'pull out' and may lead to industrial relations difficulties. As will be argued below, the intent to introduce a national MW may provide a 'way out' of having to enforce a multitude of wage minima throughout the economy.

The new provisions and MW levels for 19 Hotel sector occupations are described in Table 2 (columns 1, 2 and 3). A salary comparison with the CB 'indicative' starting salaries (Table 2, col. 4) *for the same or very similar occupations* (see Table 2, column 5, and the notes) is also made. The 2019 MLWSI lengthy table on CB 'indicative' starting salaries (of which Table 1 is a summary constructed by this author) contains approximately 115 distinct occupations and starting salaries in the Hotel sector; of these about 25 are low-salary levels (steps 1, 2 and 3 in the MLWSI original multi-page table). Some duplication of salaries exists, and the new MW arrangements apply to 19 low-earning hotel occupations. Presumably, the 6-occupation difference reflects the pre-existing duplication of salaries and lack of genuine distinctiveness between occupations. At this level of detail, classifications inevitably bring individual personalities into focus, clouding occupational distinctions based on skills, and raising questions about the role of the state in micromanaging occupational wage differentials.

Table 2 shows that the 19 low-earning occupations were granted immediate salary increases between EUR 74-EUR 244 pm. Thus, a low tenure 'Assistant receptionist' who, under the CB agreements of 2019 received a starting salary of EUR 796 pm, now earns EUR 870 pm, or a 9.3% increase. By contrast, an 'Assistant table waiter' with tenure above 6 months who had been earning EUR 796 pm now earns EUR 1040 pm, or a 30.7% increase. Are these dramatic differences from the negotiated 2019 salaries based on fundamentals that escaped the attention of negotiators one year earlier? Or do they reflect different realities in the labour market of 2020, one year later?

Setting detailed salaries in this administrative fashion may entail non-market-based considerations, which may lead to inefficiencies. Should a 'Receptionist B' earn a salary of EUR 1070 pm which happens to be EUR 170 pm higher than that of a 'Bar assistant waiter' with tenure up to 6 months? Should a 'Kitchen apprentice' with tenure above 6 months be making EUR 1040 pm? This is EUR 116 pm higher than the EUR 924 pm MW currently specified for a Clerk, or a

personal care worker (with the same tenure) in the non-unionised sector. The changes noted in Table 2 invite comparisons between occupational categories and build rigidities into a new MW architecture that may be regretted as conditions change in the future.

TABLE 2

New MWs by occupation in the Hotel sector, as per Council of Ministers' Order of 8/1/2020 (cols. 2 and 3); comparison with 'indicative' start salaries in CB agreements (col.4).

	Occupation as described in Order of 8/1/2020	*New MW 2020*		*Old CB salary 2019*	
		€ pm	€ ph approx 165 hrs	€ pm 'Indicative' basic salary	Match with Tab. 1
1	Porter, tenure up to 6 mos.	870	5.28	695	(i)
2	Porter, tenure greater than 6 mos.	935	5.68	796	(ii)
3	Assistant receptionist, tenure up to 3 mos.	870	5.28	796	Exact
4	Groom/Receptionist	935	5.68	796	(v)
5	Receptionist B	1070	6.50	868	Exact
6	Bar assistant waiter, tenure up to 6 mos.	900	5.47	n/a	
7	Bar assistant waiter, tenure greater than 6 mos.	1040	6.32	n/a	
8	Minibar attendant	1070	6.50	868	Exact
9	Assistant table waiter, tenure up to 6 mos.	900	5.47	695	(i)
10	Assistant table waiter, tenure more than 6 mos.	1040	6.32	796	Exact
11	Kitchen apprentice, tenure up to 6 mos.	900	5.47	695	(i)
12	Kitchen apprentice, tenure more than 6 mos.	1040	6.32	796	(ii)
13	Confection apprentice, tenure up to 6 mos.	900	5.47	695	(i)
14	Confection apprentice, tenure more than 6 mos.	1040	6.32	796	(iii)
15	Room attendant, tenure up to 3 mos.	920	5.59	796	(iv)
16	Room attendant, tenure greater than 3 mos.	970	5.89	868	(iii)
17	Cleaner	970	5.89	868	Exact
18	Laundry attendant	960	5.83	868	Exact
19	Pool attendant	960	5.83	868	Exact

Source: MLWSI and Christofides (2019)

Notes: Columns 1, 2 and 3 of this Table 2 are sourced from the Council of Ministers' Order of 2020 regarding MWs in the Hotel industry, based on Article 3(1) of the Minimum Wage Law (Ch. 183). The notes in column 5 refer to the closeness of the match between the occupations listed in Table 1 and those in the present Table 2. The word "Exact" indicates a perfect match between the occupation description listed in Tables 1 and 2. The remaining notes (i) to (v) indicate slight tenure or other differences between the descriptions of occupations in the two tables. The occupations in rows 6 and 7 do not have an obvious correspondence between Tables 1 and 2, but they are assessed like those in rows 9 and 10.

Note (i): For tenure up to 4 months rather than 6 months

Note (ii): For tenure above 4 months rather than 6 months

Note (iii): Tenure not specified

Note (iv): Tenure up to 1 month rather than 3

Note (v): Similar description, best match

Beyond this concern, there is the apprehension that demands for an extension of similar arrangements to other sectors may lie ahead, with adverse effects on price pass-through and competitiveness. This is not too far-fetched. To begin with, the increase in salaries for the low-paid in the hotel sector may generate demands for higher wages by hotel employees positioned at higher levels of pay; they may object that they now make little more than hotel workers at lower salary scales. These comparisons may generalise to other sectors and occupations. There is a shortage of labour *at currently prevailing wages*, to the point that employers are asking for more generous employment regulations for asylum seekers. This shortage may encourage higher wage demands in many sectors of the economy.[7]

A further implication of the change in legal status of the salaries for the 19 occupations in Table 2 is that these are now subject to inspection and enforcement by MLWSI. This will increase surveillance and the administrative burden of the Department of Labour Relations (DLR) in MLWSI, reducing the effective supervision and implementation of any new MW arrangements. The capacity of this department to inspect business premises has been re-structured to ensure that all relevant labour legislation, including the payment of MWs, is adhered to. Some information on the activities of DLR (not just on MW compliance), appears in Table 3, sourced from Christofides (2019) and an MLWSI (2019) web-page that is currently unavailable. The number of inspections generally exceeded the complaints received and was higher in 2018 (3205) than 2015 (2941). Most complaints came from non-Cypriots (EU and third country citizens), absolutely and relative to their employment. Several cases were heard in court. In 2018, 278 cases were examined, and fines of EUR 181,195 were imposed. Thus, the fine per case heard was a mere EUR 652; such penalties may not encourage compliance with MW Orders and unions are rightly demanding that higher penalties should be imposed.

TABLE 3

Statistics of Inspections held by the Department of Labour Relations 2015-2018

DLR Inspections	2015	2016	2017	2018
No. of Inspections	2 941	4 085	3 455	3 205
Total Complaints Submitted to the DLR	3 343	2 173	2 046	2 190
Cypriots	1 296	800	672	758
EU Citizens	1 159	779	697	752
Third Country Nationals	888	594	677	680

Source: Christofides (2019), based on an MLWSI (2019) web page which is currently unavailable.

[7] It is possible that, at a time when a substantial section of the population remains unvaccinated, occupations with high levels of customer contact may be deemed as particularly dangerous and may command a wage premium. Some of these tasks may be performed more cheaply in the underground economy. A recent assessment of its prevalence in Cyprus is contained in Andreou et al. (2021).

2.4 A possible architecture and level of a national MW

Possible paths towards a national, legally binding, MW are now considered, and a reasonable level of a possible national MW is explored. A complex MW system based on fine occupational distinctions (such as those in Table 2) suffers from the difficulties considered in the previous section: (i) determining and enforcing occupational wage differentials may prove rigid and inefficient as circumstances change, even if 'correctly' set at the outset, and (ii) a statutory wage setting needs to be enforced, an expensive task beyond both the DLR at MLWSI and the judicial system as currently structured. As a result, a system of occupational wage minima would degenerate into an unenforceable arrangement which might even lead individual employers to quit associations that negotiate unacceptable minima. Knowing this, employer associations would negotiate much harder, making CB agreements more difficult to reach and leading to industrial relations difficulties. An alternative plan, based on extending the current system of wage minima in the non-union sector to the broader labour market, is now explored. The dissatisfaction of unions with the degree to which employers honour the 'indicative' salaries in CB agreements needs to be addressed and some thoughts are offered below.

Prior to the Hotel agreement, the implementation of a national MW system, fashioned after the one now prevailing in the non-union sector, might have depended on a gradual increase in the wages paid in low-earning union occupations towards the current MW levels of EUR 870 pm and EUR 924 pm (with tenure greater than six months). A decline of the annual unemployment rate towards its pre-crisis level would also have helped. This approach would (i) produce a simple system, easy to set, enforce, and revise over time; (ii) depend on only two monthly salary levels, which would become 'floors' for all occupations; (iii) revolve around levels of the MW which have already been 'absorbed and digested' by the labour market; (iv) rely on levels of the MW which are higher than the Guaranteed Minimum Income (GMI) for several household classes, providing an incentive to work; and (iv) leave existing programmes for persons with disabilities, domestic workers, refugee claimants, and persons working in occupations where food and accommodation are provided, unaffected; these could be re-thought and revised separately, as need arises. The precise level of the national MWs is not material when discussing the overall architecture of the system, but some criteria for setting the appropriate levels are considered below.

Some unionists object to this model because they argue that it allows the state to claim it as a panacea for in-work poverty reduction, ignoring the complexity of the problems. They argue that a system based on CB and the Hotel agreement, would be more effective. This argument is not convincing as (i) the Hotel agreement was reached under very unusual pandemic circumstances, and (ii) the 'indicative' starting salaries for the Hotel and the Hospitality sectors in Table 1, reached only a year earlier, left union workers in these two sectors earning salaries much lower than the MW in the non-union sector! CB had failed to raise wages in those sectors.

As it happens, the subsequent Hotel sector agreement accelerated the timeline that might have occurred organically and has shifted low-wage employees from the left tail of the wage distribution not just to the non-union MW range but well-beyond it; for example, a Minibar attendant making EUR 1070 pm is now paid EUR 200 pm more than the starting MW of EUR 870 pm for a Clerk or a personal care worker in the non-union sector.

An important issue is whether the MW levels of EUR 870 pm and EUR 924 pm are still appropriate as elements of a national MW policy. Of course, these would not be set in stone and may,

following an appropriate process, be altered, even at the implementation stage. Nevertheless, it is useful to consider this issue in the context of the current system of social insurance and labour market realities. To begin with, the GMI programme offers minimum support to all eligible individuals. The level for a single individual is EUR 480 pm, for a beneficiary with one dependent (say a spouse) it is EUR 720 pm (EUR 480+240), and for the previous household plus a child under 14 it is EUR 864 pm (EUR 480+240+144).[8] Even this last household scenario produces a GMI below the starting MW of EUR 870 pm, let alone the MW after six months of tenure with the same employer. Of course, in cases of need, the GMI programme may supplement the above figures with emoluments for other needs, e.g. rent.

A *second* criterion that is sometimes used in discussing levels of MWs is an appropriate fraction of the median salary in a country. The ILO (2020, p. 110) reports that "Globally, …minimum wages are set, on average, at around 55% of the median wage in developed countries." Eurostat (2021) reports the 2018 (latest available) median monthly salary in Cyprus to be EUR 1477 pm, 55% of which is EUR 812 pm. In the appendix Table A1 (see below), the 2019 EU Survey of Income and Living Conditions (EU SILC) median is reported as EUR 1535 pm, which would produce an indicative MW of EUR 844 pm. Currently, median income may be somewhat higher, producing a higher MW benchmark. In this sense at least, the starting MW of EUR 870 pm is not unusually low, especially when combined with the raise to EUR 924 pm after six months with the same employer.

It should also be noted that in ILO (2020, Fig. 9.4, p. 107), the level in Cyprus of the starting nominal MW in standardised US dollars is the tenth highest in 'European and Central Asian' countries; it is nearly equal to Slovenia, but lower than Spain, and particularly the UK, France, The Netherlands, Belgium, Germany, Ireland and Luxemburg. By this *third* criterion, Cyprus is just below countries with a very high standard of living.

A *fourth* approach for fixing the starting level of a possible national MW, assuming that the figures for the MW set at the time of the last major Order in 2012 were correct, is to see what productivity and real wage changes have occurred since 2012. ILO (2020, Fig. 9.19, p. 124) reports the average annual growth of real minimum wages and labour productivity in Europe and Central Asia over the period 2010–19 (in percent). In the case of Cyprus, the starting *real* MW fell by a small amount equal to -0.1%, while productivity growth was only slightly positive at 0.2%. In other words, a small nominal increase in the MW levels (approximately 3%) may be justified on inflation and productivity grounds over the 10-year period 2010-2019.

Last, but not least, a national MW at EUR 870 pm would be equal to the lowest starting salary in Table 2 (Porter, Assistant Receptionist, rows 1 and 3, Table 2). A national MW would require no special enforcement provisions for these hotel groups. However, all other minima in Table 2 would be higher than a national MW at the EUR 870 pm. A higher national MW at EUR 1070 (the minimum for a 'Minibar attendant' in row 8, Table 2) would also resolve the enforcement issue for the higher-paid individuals in Table 2; however, the above considerations suggest that such a level may be judged to be too high as a national MW. A way forward may be for the government to claim that hoteliers have already agreed to starting minima above EUR 870 for some occupations in their sector and seek their co-operation in honouring them. It is not known whether the statutory imposition of the minima in Table 2 was a 'one-off', or whether a continuing commitment has been made. The introduction of a national MW may offer an opportunity to the

[8] See Christofides and Koutsampelas (2019).

government to avoid a long-standing commitment, given that the purpose of a national MW is to improve the lowest levels of pay and not to enforce CB provisions. As seen earlier, the starting salaries for the unionised Hotel and Hospitality sectors in Table 1, were much lower than the MW in the non-union sector.

These considerations suggest that the current starting and experience-adjusted MW levels of EUR 870 pm and EUR 924 pm do not appear to be blatantly out of line with international practices and local realities. Those who feel that these levels are disappointingly low, should note that these are minima which may be revised as conditions change, and do not prevent the market from generating higher wages. In any case, it would be prudent to see where the currently prevailing MWs fit in the wage distribution and the size of the mass that might be 'swept up' by the imposition of a national MW at these levels.

2.5 The wage distribution in Cyprus

The wage distribution in Cyprus is examined using the most recently available micro data in the EU SILC; this is useful for at least two reasons: first, it indicates relevant quantities, such as the mean and median wage earned. Second, it makes it possible to see whether existing MW legislation produces discernible spikes at the monthly income ranges that are likely to contain the levels specified by legislation, speaking to the size of the MW group and the degree of compliance. How many individuals earn the MW as the system is structured at the time of the EU SILC data collection, and how many more might be added as a result of any changes in the system?

It is important to note at the outset that the second objective may not be achieved with accuracy for various reasons: (i) the number of individuals subject to the minimum wage rate is limited to a small number of occupations and non-random samples may result, (ii) cleaners and security guards are paid by the hour and, depending on their hours worked, this could result in MW incomes that fall in a wide range of incomes, (iii) the legislation may not be observed, (iv) the MW specified in the legislation may become a popular reference point, generating observations near the MW in other low-wage sectors, (v) incomes may not be accurately recalled and/or reported and samples may not be representative, or large enough, and, finally (vi) a survey instrument may not report occupations at the level of detail needed to identify MW-eligible categories; this is the case for the EU SILC and Cyprus.

Keeping in mind these concerns and the narrow objective of inspecting the wage distribution, micro data for individuals from the 2015, 2016, 2017, 2018 and 2019 EU SILC surveys are examined. EU SILC appears to be the only recent survey of the needed scope and size. Of the universe of observations in the five years, only those of 'Employees working full-time' (PL031=1) are retained. Part-timers, the self-employed, the unemployed, students, retirees, the disabled, those in compulsory military or community service or fulfilling domestic or care tasks, and other inactive persons are omitted. Monthly income is determined as annual income from full time employment (PY010g) divided by the number of months spent in full time work as an employee (PL073). A total of 18,037 observations are possible with known wage and occupation information. Mean (median) income rises from EUR 2056 (1521) in 2015 to EUR 2089 (1535) in 2019. At the same time, the annual distributions become more concentrated, as the standard deviation declines over time (Appendix Table A1).

Gross monthly incomes for all five years are grouped into EUR 50 ranges between EUR 0 and EUR 1,800 (a limit that was judged high-enough for studying the MW-relevant area of the wage

distribution), and number-coded for ease of graphical presentation (Table A2). Table A3 provides the frequency distribution for the 18,037 observations. MW jobs at EUR 870 pm and EUR 924 pm should be in income codes 18 (EUR 851-900) and 19 (EUR 901-950). Cleaners and security guards, for whom the statutory MW is stated on an hourly basis, can only be classified with their hours and length of tenure known, but this is not possible. Other things equal, cleaners are likely to be located below security guards. It may be reasonable to expect MW mass not only at codes 18 and 19 but also around this area. Where a 13th salary is paid, division of annual income by the months worked (e.g., 12) would result in monthly salaries above the MW Order ones and produce mass at higher income codes than 18 and 19.

In Table A3, the percent of observations in code 18 is 2.87% and that in code 19 is 2.88%. However, relatively high frequencies also exist for codes 16 (1.9%) and 17 (1.82%), as well as codes 20 to 22 (3.21%, 2.69% and 3.41% respectively). These percentages are local maxima.[9] Note that the *cumulative* density at code 17, just prior to the strict starting MW in code 18, is 13.58%. This represents the proportion of all full-time employees earning less than the code where the current starting MW is located; allowing for all the uncertainties with the EU SILC data noted above, this may be the maximum number that will be swept up to a national MW, if it were in code 18. Indeed, since the EU SILC data predate the Hotel agreement, which should now have eliminated low-paid hotel employees from codes below 18, this figure is an overestimate of the current numbers that would be affected by a national MW. Figure A1 maps these observations, albeit not very clearly. As noted in the Appendix, it is preferable to omit the extreme minimum and maximum (1 and 37 respectively) income code observations and, at the same time, to focus separately on (i) the sample which is *likely* to contain MW individuals (definitions MWall=1 or MWsel=1 in the Appendix) and (ii) the sample which is *unlikely* to contain MW observations (MWall=0 or MWsel=0 in the Appendix).

Based on the MWall definition, where only Major Groups 4 (Clerks), 5 (Personal Service Workers), and 9 (Elementary Occupations) are deemed to populate the category of individuals on the MW (MWall=1), Table A4 and Figure A2 present similar information only for the 7,948 individuals presumed to be on the MW. Especially high spikes are observed at codes 18 to 20 (4.55%, 4.37% and 4.6% respectively). No doubt much of this mass is due to MW receipt. Interestingly, income codes 8 and 9 continue to display high mass (4.88% and 4.10% respectively). The cumulative density at code 17 is now 25.19%, suggesting that about a quarter of full-time employees *in Major Groups 4, 5, and 9* could be swept up to code 18 – should this be the range within which a national MW is located. This is higher than the 13.58% noted for the whole sample in the previous paragraph, because MWall=1 generally selects low-income Major Groups.

Table A5 and Figure A3 deal only with the sample of 10,089 individuals in occupations not likely to be subject to the MW (e.g. Professionals and Managers). For them MWall=0. Figure A3 displays a rather different pattern to that present in the MWall=1 Figure A2. There is no special concentration of mass at codes 18 and 19, though codes 20 and 22 still have relatively high mass. This suggests that, indeed, it is income codes 18 and 19 that contain the bulk of MW individuals – given that codes *other than 4, 5 and 9* (where MWall=0) generally contain higher-earning professionals. Note that codes 7 and 8 have no notable mass in this sample of higher-earning employees.

[9] A relatively high frequency is evident in code 8 (EUR 351-400), namely 2.18%. This may occur for a number of reasons; for example, it may be for full-time paid work which has other non-pecuniary benefits such as food and shelter, as might be the case in sectors such as agriculture and domestic work.

Turning to the MWsel definition, we note that the qualitative nature of the results above does not change substantially. Of greater interest is the breakdown by Major Group, 4 (Clerks), 5 (Personal Service Workers, and 9 (Elementary Occupations). The concentration of mass at the MW codes around 18 and 19 is very much more pronounced in Group 5 than in Groups 4 and 9. This suggests that despite the fact that the term 'Clerk' is mentioned in the MW Order, in practice this occupational category is diverse and may entail senior, high-paying, responsibilities. Group 9 is also diverse and includes individuals in positions that appear quite senior.

2.6 Brief review of recent international surveys of the literature and MW studies in Cyprus

Experience with various aspects of MWs in several European countries is contained in Brewer et al. (2019), Caliendo et al. (2018), Gautier et al. (2019), Low Pay Commission (2019), and Schmitz (2019). Cahuc et al. (2014), Brown and Hamermesh (2019), and Neumark (2018) review recent findings in MW research. Table 1 in Brown and Hamermesh (2019) presents results from a number of papers on teenagers and restaurant workers, who are often the subject of MW research: an increase in the MW will increase wages (a statistically significant result) and usually reduce employment; however, these employment effects are not always significant. Neumark (2018, p. 35), on the other hand, suggests that "…it is indisputable that there is a body of evidence pointing to job losses from higher minimum wages". These papers stress that less is known about (i) the *introduction* of a MW, (ii) *large* increases in the MW, and (iii) its application to individuals *other than low-paid workers*. In the context of Cyprus, where a national minimum wage is being contemplated, these issues are particularly relevant.

For Cyprus, only two related pieces appear to exist, viz. Mitsis (2013) and Mitsis (2015). The latter, studies the dynamic effects of the MW on total employment in a time series, VAR, model, where employment and the minimum wage are endogenous. It suggests that the MW creates large dis-employment effects. Mitsis (2013) examines the effects of the MW using micro data from four Household Budget Surveys over 1990-2009. Wages and the probability of employment are examined in separate equations. Looking at all workers earning within 25% of the MW, he reports that a 1% increase in the MW will lead to a 0.9% increase in the wages of individuals in both the MW-covered and the MW-uncovered private sectors (Table 3.3, p. 82). From the employment Probit equation, he suggests that a 1% increase in the MW will reduce the probability of employment (by about -0.712%); this result is statistically significant only at the 10 % level. Rather surprisingly, more negative and significant effects exist in the uncontrolled sector (Table 3.4, p. 84). The negative employment results are larger than in Brown and Hamermesh (2019, Table 1) and suggest that care should be exercised in setting a high national MW.

3. Summary and conclusions

In Cyprus, the historical role of minimum wages (MWs) has been to ensure adequate compensation for individuals in a small number of professions that are not represented by unions, viz. shop assistants, clerks, child-care workers, and personal care workers. While monthly wages of EUR 870 pm and EUR 924 pm (after six months with the same employer) are specified for the above professions, cleaners and security guards are also covered by the Minimum Wage Order of 2012, but they are paid on an hourly basis – footnote 6. In the union sector, minimum 'indicative' starting salaries are agreed upon, through collective bargaining (CB), between employers and unions for about 180 occupations, of which over 100 are in the Hotel sector. These

CB agreements may be largely adhered to, but they are not legally binding. This system prevailed during, and has survived, the Troika period of 2013-2016; however, it is generally believed that adherence to the terms of CB agreements weakened during this and the pandemic period that continues.

Meanwhile, academic empirical work, which has largely studied MWs in low-income situations, has produced *at best* muted evidence of dis-employment effects. Theoretical work has explored conditions under which the competitive analysis and conclusions would not hold, providing some further momentum in exploring the effects of MWs. The ILO (2020) reports that most countries run some form of MWs and, in the EU, only six countries (including Cyprus) do not have a statutory national MW. The European Pillar of Social Rights Action Plan (European Commission (2021)), while mindful of possible dis-employment effects, stresses the social significance of MWs. The election manifesto of the current President of Cyprus includes a promise to discuss a national MW once conditions of full employment return.

Unions in Cyprus, some of which have long sought to make provisions of CB agreements legally binding, have been working towards this goal by backing an extension of MW provisions to 19 low-income Hotel occupations. At least one union is now demanding that this arrangement be generalised to all CB 'indicative' starting salaries that will be negotiated in the future, in effect gaining legal protection for some CB provisions.

Notwithstanding the Hotel agreement, which was negotiated under pandemic conditions, employers have traditionally opposed making CB agreements legally binding, leading unions to argue that they are not negotiating in earnest and not intending to honour their commitments. This mistrust might be ameliorated if employer associations clarified to their members, and secured from them, strong support for any CB commitments. However, unions must also recognise that if members of an employer association were obliged to honour CB agreements, they might reject proposals brought to them, or leave their association altogether. In any case, union demands would be scrutinised and perhaps opposed much more strenuously if CB agreements had legal force.

The Hotel agreement, enforced by a Ministerial Order issued in January 2020, was consensual, we understand, yet it has modified the extant architecture of wage determination in a surprising way. It is not clear if this Order is a single extraordinary event, or whether a long-standing commitment to update it has been made. Nor is it clear whether the new Hotel sector arrangements would continue if a national MW were adopted. This agreement has introduced a variety of wage increases, some small and some very large, to the 'indicative' starting salaries previously agreed for Hotels through CB (Table 2). And it has adjusted wages at a micro-occupational level, distinguishing, for example, between a Porter (MW of EUR 870 pm) and a Bar Assistant Waiter (MW of EUR 900 pm), both with tenure up to six months.

In principle, these fine distinctions would need to be enforced and it is not clear whether the state should have a role to play at this level of occupational detail. Moreover, these wage increases may encourage increased wage demands by others, both in the Hotel sector and elsewhere, compromising competitiveness in the tradable sector. In the non-tradable sector, where external pressure is not a factor to the same extent, price increases may occur. Since the labour market is tightening up considerably, these concerns may prove real.

The Hotel agreement has raised the lowest starting salary for some occupations to the level of the starting MW (EUR 870 pm) in the non-union sector, making this starting salary a focal one and

possibly a candidate for a simple national MW system. How does its level compare with international MW standards, conditions in the labour market of Cyprus, and its social safety net? Section 2.4 considers several criteria. The conclusion in that section is that a *national* starting MW at EUR 870 pm, rising to EUR 924 pm after six months with the same employer, is not unduly low. Of course, the argument here is not that these are necessarily the appropriate levels for a national MW system, only that they can be supported by several relevant arguments.

Explorations of the wage distribution in section 2.5, using EU SILC data that pre-date the Hotel agreement, suggest that up to 13.58% of the number of full-time employees earning monthly salaries below the current starting MW of EUR 870 pm, could (depending on compliance) be 'swept up' to a national MW set at that level. The Hotel agreement has, intentionally or otherwise, paved the way for the adoption of a national MW by reducing the number of workers that would be affected by its introduction, so that the figure of 13.58% should now be an overestimate.

Table 1 suggests that the main remaining problem area in the union sector may be Hospitality (last row, Table 1),[10] where starting salaries agreed by unions are currently well below the MW in the non-union sector. The Hospitality sector also relies on large numbers of third country workers. The proper channel for the employment of these workers is a two-year renewable contract, whose provisions (including the minimum salary) are regulated by the government - for a more complete discussion see Christofides (2018, p.4). A national MW would increase the wage cost of all EU workers and may require that more attention be paid to the terms of employment for third-country workers. Hospitality is a sector where the effects of a national MW may be felt: employment and firm profits may be affected, restaurant prices may rise,[11] but also wage increases may improve worker commitment and productivity, ameliorating some of these effects.

The quest for a national MW entails a clear political element and motivation. The redistributive element (political in origin but also entailing significant economic implications), if it can be achieved without compromising overall competitiveness and employment, is one that many would support. This would be more likely if the burden of a national MW can be minimised and shared widely. A level that has been 'digested' by the labour market such as the currently prevailing initial MW is a natural starting point for discussion.

In addition, a national MW could obviate the need for the government to continue micromanaging occupational distinctions and enforcing the new minima in the Hotel sector. However, unions would like the government to venture even further and enforce all 'indicative' CB starting salaries (see Table 1) in the union sector. The 'shoehorn' of the Hotel agreement, which is facilitating the introduction of a national MW, may prove hard to retract if unions press this demand. Such an arrangement would imply that either MLWSI or the judicial system must oversee and enforce these salaries throughout the economy, a task which is clearly beyond them, and a philosophy that society is likely to reject. For the prevailing view of the role of MWs is that they should provide incentives to work, redistribute income to poorly paid sections of society, and reduce in-work poverty.

The question in the political arena appears to no longer be whether a national MW rate should be introduced. The political momentum for this policy change, feeding on diverse motives, may be

[10] Rewards in Agriculture/Animal Husbandry often entail non-pecuniary benefits such as food and shelter, making the entry in Table 1 unrepresentative of total earnings.

[11] For an investigation of price effects arising from the MW in Hungary, see Harasztosi and Lindner (2019).

strong enough to carry it through. The level of a national MW and how it should be adjusted should ideally be determined following advice from a truly independent advisory board, which can bring technical considerations and the national interest to the table. The Labour Advisory Board contains lobby groups which are certainly affected (government, employers, and the unions) but lacks the detachment that independent economic and labour market experts can bring. Independent experts should be sufficient in number to have an impact on possible recommendations, though governments would have the ultimate say concerning these proposals. Current discussions on a national MW have interpreted the meaning of the term 'social partners' too narrowly and are proceeding as if (i) expertise in labour economics and wage determination is not available elsewhere, (ii) a national MW has no impact on consumers and other members of society, and (iii) redistribution and the reduction of in-work poverty by elected governments require input from trade unions and employer associations, to the exclusion of specialised social scientists and relevant civic groups.

An independent advisory body is the model followed in several countries - information on the UK's Low Pay Commission is available in the References. Its recommendations and the reasons for them (including the advice contained in professional studies) should be in writing and made public, so that society can share in the process and accept the proposed actions, reducing compliance problems.

Almost three decades ago, but after the new research on minimum wages had begun, Freeman (1996, p. 648) provided a summary on the subject of MWs which is as relevant today as it was then: "A minimum wage is not a panacea to poverty and low wages. It does not, in general, increase national output or the rate of growth of productivity. It redistributes income. It can improve the well-being of some low-wage workers and limit the tide of rising earnings inequality … As with other redistributive interventions, however, the minimum carries with it some risks of inefficiency losses and may not always help those it is intended to help. The higher the level of the minimum, the greater is the redistributive benefit, but also the greater the risk of job loss … the long-term well-being of workers in the lower rung of the earnings distribution depends ultimately on increasing their productivity."

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Appendix on EU SILC Microdata (2015-2019)

Wage Distributions

The data below derive from the EU SILC public use micro data, after only full-time employees have been selected.

TABLE A1

Sample summary statistics

	2015	**2016**	**2017**	**2018**	**2019**	**2015-2019**
Number of observations	3519	3372	3629	3691	3826	18037
Gross Monthly Income Mean	2055.52	2034.7	2038.06	2045.93	2089.17	2053.29
Gross Monthly Income Median	1521	1528.5	1528	1528	1534.5	1528
Standard Deviation	2657.96	2456.5	2482.73	2428.7	2255.81	2456.04

TABLE A2

Income codes

Monthly Income Code	**Gross Monthly Income Ranges**
1	0-50
2	51-100
3	101-150
4	151-200
5	201-250
6	251-300
7	301-350
8	351-400
9	401-450
10	451-500
11	501-550
12	551-600
13	601-650
14	651-700
15	701-750
16	751-800
17	801-850
18	851-900
19	901-950

Monthly Income Code	**Gross Monthly Income Ranges**
20	951-1000
21	1001-1050
22	1051-1100
23	1101-1150
24	1151-1200
25	1201-1250
26	1251-1300
27	1301-1350
28	1351-1400
29	1401-1450
30	1451-1500
31	1501-1550
32	1551-1600
33	1601-1650
34	1651-1700
35	1701-1750
36	1751-1800
37	1801+

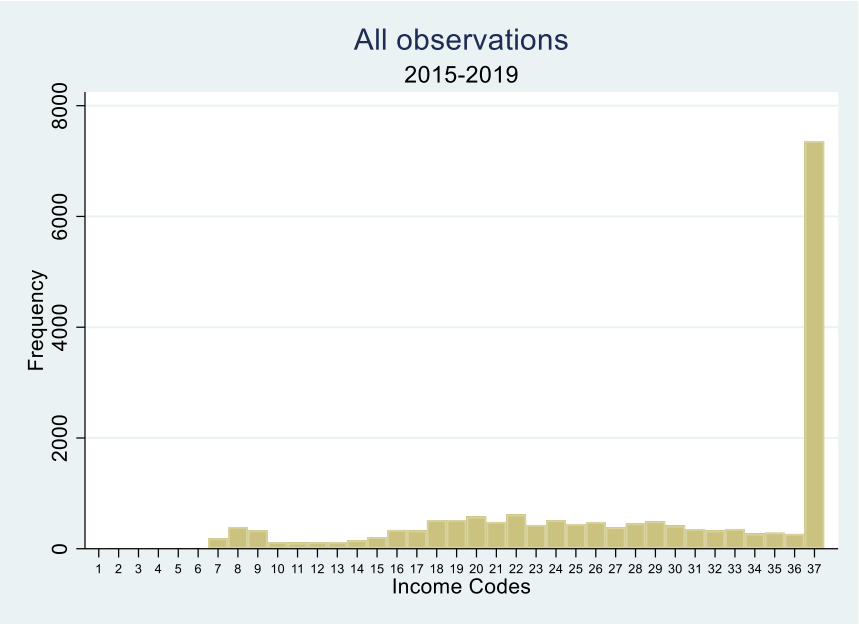
TABLE A3

Frequency data per income range. All observations (2015-2019)

Income Code	Freq.	Percent	Cum.
1	0	0	0
2	5	0.03	0.03
3	2	0.01	0.04
4	5	0.03	0.07
5	2	0.01	0.08
6	17	0.09	0.17
7	188	1.04	1.21
8	394	2.18	3.40
9	332	1.84	5.24
10	121	0.67	5.91
11	110	0.61	6.52
12	120	0.67	7.19
13	123	0.68	7.87
14	152	0.84	8.71
15	209	1.16	9.87
16	342	1.90	11.76
17	328	1.82	13.58
18	518	2.87	16.46
19	520	2.88	19.34
20	579	3.21	22.55
21	485	2.69	25.24
22	615	3.41	28.65
23	431	2.39	31.04
24	515	2.86	33.89
25	448	2.48	36.38
26	484	2.68	39.06
27	387	2.15	41.20
28	458	2.54	43.74
29	494	2.74	46.48
30	416	2.31	48.79
31	356	1.97	50.76
32	328	1.82	52.58
33	358	1.98	54.57
34	271	1.50	56.07
35	291	1.61	57.68
36	270	1.50	59.18
37	7,363	40.82	100.00
Total	18,037	100.00	

FIGURE A1

Frequency distribution (Table A3, col. 2)



Two refinements:

(i) Omitting income codes 1 and 37 in Table A2 to achieve better graphical representations

Data from these two, min and max, income codes do not allow for a clear view of the relevant MW income ranges and have been excluded from the figures shown.

(ii) Summary of two MW definitions (without ('all') and with (selected, or 'sel') 2-digit restrictions imposed)

The EU SILC data do not report the occupational categories of recipients at the 4-digit level; it is this fine level of detail that might identify individuals subject to the MW statutes. EU SILC provides a level of occupational detail limited to 2-digit categories (Major Sub-Groups). However, even these are so broad as to be of limited use for a study of the MW experience. In consequence, the only option for attempting refinements in the identification of MW individuals is to exclude or include *entire* 2-digit Major Sub-groups. This has not proved helpful and, in general, we present most results using 1-digit Major Group definitions. We report only briefly some results which attempt use of the 2-digit information, as described below. For MWall, no 2-digit information is used for this method of identifying individuals likely to be on the MW. For MWsel, an attempt is made to use 2-digit information and some very limited results are reported.

MWall: All observations in Major Groups 4, 5, and 9 are set to 1, and all others to zero.

MWsel: All observations in Major Group 4, all observations in Major Group 5 except those in the two-digit Major Sub-Group 54, and all observations in Major Group 9 except those in the two-digit Major Sub-Group 93, are set to 1 and all others are set to zero.

We proceed along the lines described above.

TABLE A4

Frequency data per income range. All observations for which MWall=1 (2015-2019)

Income Code	Freq.	Percent	Cum.
1	0	0	0
2	2	0.03	0.03
3	1	0.01	0.04
4	5	0.06	0.10
5	1	0.01	0.11
6	9	0.11	0.23
7	182	2.29	2.52
8	388	4.88	7.40
9	326	4.10	11.50
10	109	1.37	12.87
11	75	0.94	13.81
12	98	1.23	15.05
13	87	1.09	16.14
14	106	1.33	17.48
15	142	1.79	19.26
16	245	3.08	22.35
17	226	2.84	25.19
18	362	4.55	29.74
19	347	4.37	34.11
20	366	4.60	38.71
21	306	3.85	42.56
22	335	4.21	46.78
23	249	3.13	49.91
24	282	3.55	53.46
25	224	2.82	56.28
26	253	3.18	59.46
27	225	2.83	62.29
28	274	3.45	65.74
29	282	3.55	69.29
30	196	2.47	71.75
31	159	2.00	73.75
32	140	1.76	75.52
33	136	1.71	77.23
34	127	1.60	78.82
35	136	1.71	80.54
36	103	1.30	81.83
37	1,444	18.17	100.00
Total	7,948	100.00	

FIGURE A2

Frequency distribution (Table A4, col. 2)

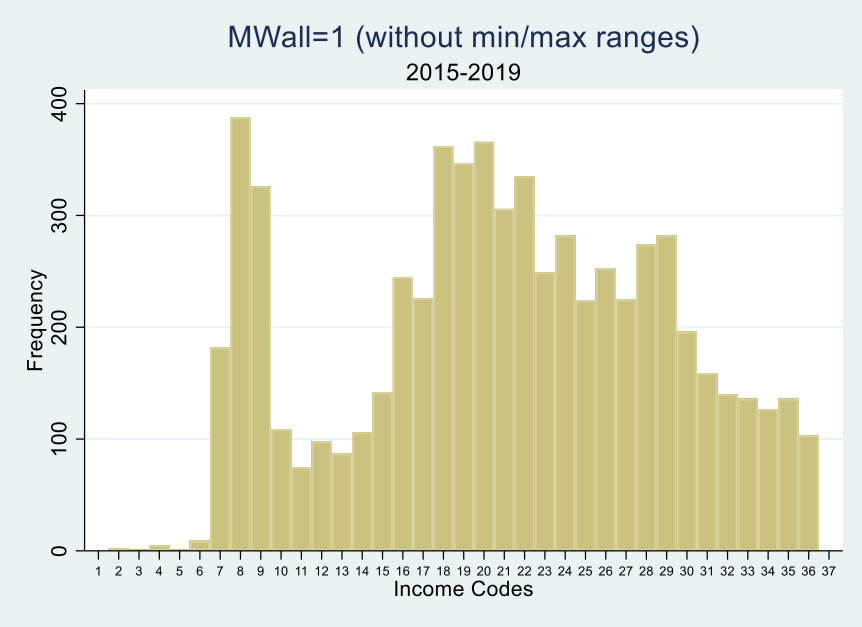


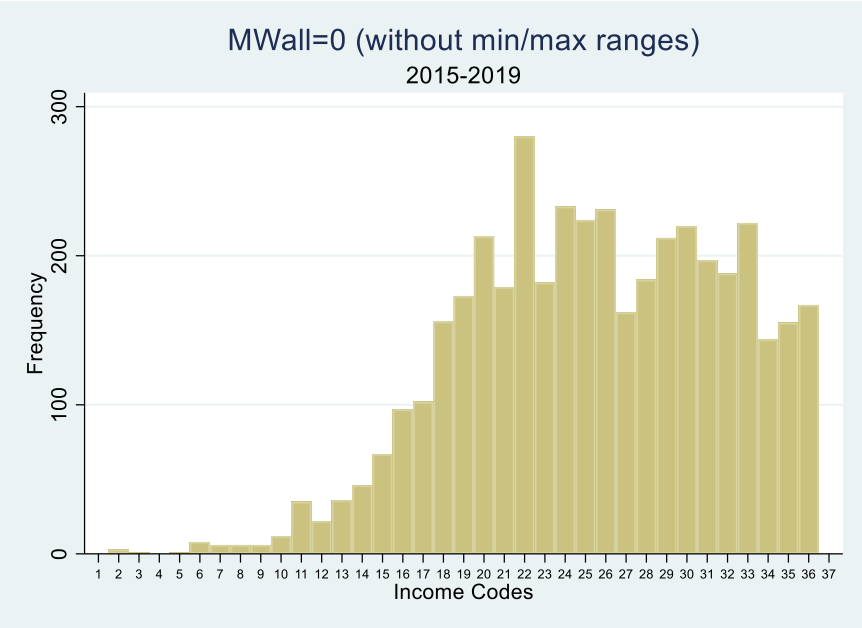
TABLE A5

Frequency data per income range. All observations for which MWall=0 (2015-2019)

Income Code	Freq.	Percent	Cum.
1	0	0	0
2	3	0.03	0.03
3	1	0.01	0.04
4	0	0	0.04
5	1	0.01	0.05
6	8	0.08	0.13
7	6	0.06	0.19
8	6	0.06	0.25
9	6	0.06	0.31
10	12	0.12	0.43
11	35	0.35	0.77
12	22	0.22	0.99
13	36	0.36	1.35
14	46	0.46	1.80
15	67	0.66	2.47
16	97	0.96	3.43
17	102	1.01	4.44
18	156	1.55	5.99
19	173	1.71	7.70
20	213	2.11	9.81
21	179	1.77	11.59
22	280	2.78	14.36
23	182	1.80	16.17
24	233	2.31	18.48
25	224	2.22	20.70
26	231	2.29	22.99
27	162	1.61	24.59
28	184	1.82	26.41
29	212	2.10	28.52
30	220	2.18	30.70
31	197	1.95	32.65
32	188	1.86	34.51
33	222	2.20	36.71
34	144	1.43	38.14
35	155	1.54	39.68
36	167	1.66	41.33
37	5,919	58.67	100.00
Total	10,089	100.00	

FIGURE A3

Frequency distribution (Table A5, col. 2)



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