

Statutory minimum wages in the EU:

Institutional settings and macroeconomic implications*

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Abstract

This paper analyses some macroeconomic implications of the statutory minimum wage in the member states of the European Union and assesses how its institutional design influences these outcomes. First, the paper looks at the institutional dimensions of statutory minimum wage setting. On the basis of this information, an indicator of institutional stringency is built to characterise the degree of predictability of minimum wage setting. Second, it explores the interactions of the minimum wage with macroeconomic variables.

Keywords: Minimum wage; Statutory minimum wage; Composite indicator; Poverty; In-work poverty; European Union.

JEL codes: J38; J52; E24; I32.

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1. Introduction

There is a high and increasing interest in the minimum wage as a policy tool to reward work, improve the income distribution and provide families relief from poverty. In the Political Guidelines for the Commission, President Juncker (2014) said “(...) I believe it is necessary for all EU Member States to put in place a minimum wage”. Wages (including the minimum wage) is one of the 20 policy domains included in the European Pillar of Social Rights. In the context of the European Semester, several countries have received a Council Recommendation to improve the transparency of their minimum wage setting, or to ensure that their levels are supportive of job creation and competitiveness.

The minimum wage sets a floor to earned labour income and in that way can reduce the risks of in-work poverty associated with low pay. It may also reduce wage inequality, especially at the bottom of the wage distribution. As the labour market gets concentrated and certain types of labour fragmented, the relative bargaining power shifts in favour of the employer. In this case, the minimum wage would re-establish a balance in the bargaining position between the employer and workers. By contributing to levelling the playing field, a minimum wage, if not too high, could lead to higher wages and higher employment. ⁽¹⁾ It may also provide incentives to search for a job more intensively, thereby overcoming the costs of job-search. On the other hand, if too low, the minimum wage might be an ineffective wage floor.

Yet, it interacts with various aspects of the economic and social situation. If too high, the positive effects on labour incomes of an increase in the minimum wage are offset by the negative effect on employment of those with productivity below the minimum wage, as predicted by the perfectly competitive labour market model (e.g. Cahuc et al. 2014, Manning, 2016).

The minimum wage may affect the broader wage distribution, putting upward pressure in particular on wages slightly above the minimum wage. By compressing the wage distribution, it may create distortions, for instance, reducing the incentives for upskilling or pushing low-wage activities into the informal economy. At the same time, its level and rate of change may also serve as a reference for further wage settlements, thus providing guidance for a significant part of the wage distribution, especially when wage-setting institutions are weak.

Minimum wages affect the broader economic context through their impact on consumer prices and aggregate consumption. In competitive labour and product markets, minimum wage updates increase the cost of labour and consumer prices. This effect is potentially stronger in sectors with a high share of minimum wage earners. Thus, the impact on consumption is ambiguous and depends on the impact of minimum wage increases on consumer prices, wages, employment and the interaction with the tax-benefit system. The negative effects on employment through higher labour costs can however be mitigated by demand effects: increased purchasing power of low-wage earners may increase the demand

⁽¹⁾ In the monopsony model (Stigler, 1946), the wage paid to the additional hired worker is below its productivity and wages and employment outcomes are below those of a perfectly competitive labour market. Similarly, the presence of information asymmetries leads workers to refuse a job if the wage is too low.

for labour of other low-wage earners. Overall, the employment effect of the minimum wage is theoretically ambiguous, and it is left for empirical studies to estimate its effect.

The empirical evidence, mainly on the US, concludes that the effects on employment from minimum wage rises are of a small magnitude. Indeed, potential negative effects on the demand for labour are mitigated by a number of possible ways in which labour markets may depart from the hypothetical model of perfect competition, including, for instance, the bargaining of employers in their relationship with employees.

Finally, minimum wages also have an impact on how the economy adjusts to shocks and fluctuations and can contribute to the emergence or narrowing of macroeconomic imbalances. This underlines the importance of the minimum wage as a policy tool, especially considering that governments play a key role in the design of the minimum wage setting and in statutory minimum wage decisions, while they can only indirectly influence, if at all, other private sector wages. In more detail, for example, minimum wages may cushion fluctuations in aggregate demand and help avoiding the risk of wage undershooting, i.e., wages falling below levels warranted by fundamentals, or the risk of deflation. On the other hand, it may also hamper addressing an overshooting of wages, and have a bearing on the adjustment of the economy towards tradable sectors when that is necessary to absorb high unemployment.

The rest of this paper is structured as follows. The next section provides an overview of the institutional framework for minimum-wage setting in the different EU Member States. Section 3 presents a first look at the effect of minimum wage setting institutions on minimum wage outcomes. Section 4 it studies the interactions between minimum wage policies and macroeconomic variables over time. The last section concludes.

2. Institutional dimension of minimum wage policy

This section provides an overview of the different institutional frameworks for minimum wage setting in place in EU Member States. As a start, it reviews the institutions in place for setting wage floors, distinguishing between countries with and without a statutory minimum wage. Thereafter, it studies the different approaches in statutory minimum wage setting systems in more detail by discussing three important dimensions: (1) the actors involved and the level of government discretion in the decision-making process; (2) the timing of updates, including frequency and predictability; and (3) the criteria that should be taken into account in case of an update. Finally, for countries with a statutory minimum wage, an indicator of institutional flexibility is developed, based on characteristics of the minimum wage setting process.

2.1. Institutional framework for wage floors: Current situation in the EU

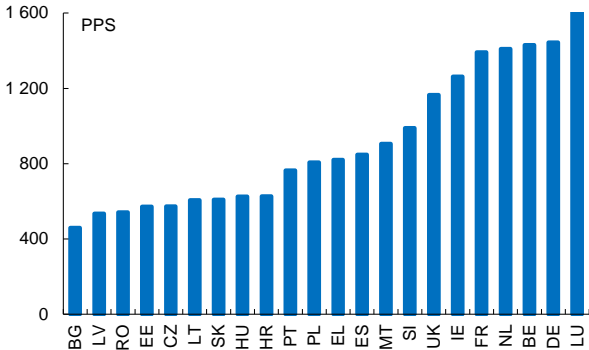
2.1.1. Countries with statutory minimum wage

In the EU, 22 Member States have a national statutory minimum wage in 2016: this is a legal or regulatory instrument making that wage floor legally binding for all workers in dependent

employment. Some EU countries have introduced it in the recent past: the UK (1999), Ireland (2000), and Germany (2015).

The level of the minimum wage varies widely across countries; this is the case even when controlling for differences in price levels (i.e. by making minimum wage figures comparable across countries in terms of their purchasing power) (Graph 1).

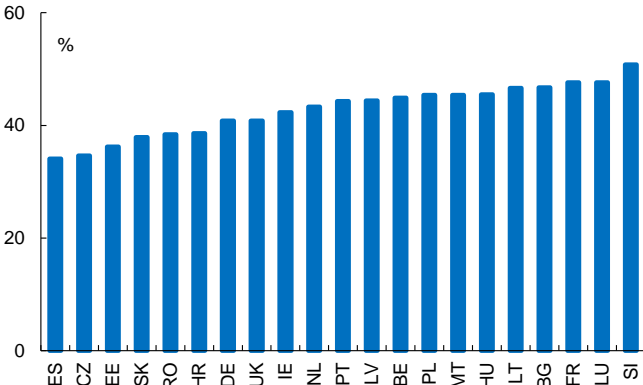
Graph 1: Minimum wage levels: July 2016 (PPS)



Note: Minimum wage data for Portugal for January 2016. Price levels expressed in purchasing power standard (PPS).
Source: European Commission, Eurostat

There is a substantial variation in the ratio of minimum wage to average, the so-called Kaitz ratio. For instance, while in Spain the proportion of the minimum wage over the mean wage is the lowest in the EU at only 33%, it is around 50% in France, Luxembourg and Slovenia (Graph 2).

Graph 2: Kaitz index: minimum wage as a proportion of the mean wage in 2015 (%)



Note: 2016 data for Germany, Malta and Slovenia; 2014 for Belgium, Estonia, France, Latvia, Luxembourg, Hungary, Netherlands and Romania.
Source: European Commission, Eurostat

Some countries allow a differentiation of statutory minimum wage for certain categories of workers; sub-minimum rates or exemptions from minimum wage provisions can be set for certain groups, for instance youth, apprentices, labour market entrants, disabled workers, or

long-term unemployed. Sub-minima tend to be defined as a share of the standard statutory minimum wage and thereby changes to the latter lead also to adjustment of the sub-minima.

This possibility of hiring at rates below the standard minimum wage can be justified to prevent the loss of employment of those groups whose productive capacity is below that of the average minimum wage earner.

Most minimum wage exceptions concern sub-minima for youth or apprentices. At least nine Member States provide for these exceptions. In other countries, the statutory minimum wage is differentiated on the basis of the difficulty of the occupation (e.g., Czech Republic or Slovakia), skills or qualifications (Hungary or Luxembourg), employment tenure (Greece), or on their status of (re-)entrants into the labour market (Ireland, Poland or Germany with sub-minima in the first two cases and exemptions in the third one). For the same worker, these exceptions have a limited duration, either explicitly – e.g. in Germany long-term unemployed are exempted from minimum wage provisions for six months – or implicitly, with the youth sub-minima not being applicable once a certain age is reached.

In other cases, inability-to-pay clauses are foreseen to take into account the employer's financial situation. For instance, in Ireland, Luxembourg, Malta and the Netherlands, employers in difficulties may temporarily undercut the minimum wage if authorised to do so by a public authority (government or court depending on the country) (ILO, 2014). Collective agreements can undercut the statutory minimum wage by 5% in Croatia.

2.1.2. Countries without a statutory minimum wage

Six Member states do not have a nation-wide statutory minimum wage. Instead, wage floors are only set in collective agreements often at sector level, which altogether tend to cover a high share of the labour force. This is the case of Austria, Denmark, Finland, Italy and Sweden. In Cyprus, the government sets statutory minimum wages only for certain occupations where workers are considered to be in a weak bargaining position.

The scope of collectively-bargained wage floor regimes depends on the robustness and coverage of collective bargaining. Countries with such bargained wage floor regimes generally have a comprehensive collective bargaining system, with high densities of both unions and employers associations (higher or even much higher than in most other EU Member States). As a result, a large proportion of workers are directly covered by a collective agreement.

Statutory minimum wages and collectively agreed wage floors are not directly comparable. The statutory minimum wage is a single floor for the whole nation, which is under the direct control or influence by national authorities. It is a minimum guaranteed pay for those employees who are not covered by the (higher) wage floors laid down in collective agreements. Collectively-bargained wage floors are the outcome of bi-partite negotiations, which can be related to hundreds or even thousands of different agreements that in turn can, and often do, foresee quite complex and differentiated pay schedules, both at sectoral, firm or territorial level.

Statutory minimum wages and collectively-agreed wage floors can co-exist in the same country: the existence of minimum wage does not prevent sub-national wage bargaining. Instruments like the extension of collective agreements to non-signatory parties can broaden the coverage of collective agreements and wage floors set by those agreements, even in countries with statutory minimum wage and low social partners' density.

The relationships between collective bargaining and statutory minimum wage may be multiple. For instance, a high minimum wage may leave less room for bargaining and lead to lower social partners' density. However, high collective bargaining coverage and high density of social partners can help to make a better informed minimum wage policy.

Recent studies show that collectively bargained wage floors tend to be set higher as a percentage of the average wage than statutory minimum wages. ⁽²⁾ High wage floors under collective bargaining may come at the expense of non-coverage. Kampelmann et al. (2013) find evidence of a trade-off between high wage floors and more people being paid below those minima under collectively bargained minimum wages regimes.

This may result from low-paying sectors, firms and individuals not covered by collective bargaining. Thus, if a large and increasing share of the workforce is not covered by collectively agreed minima, the case for introducing a statutory minimum wage becomes stronger. In this perspective, discussions on the introduction of a statutory minimum wage took place recently in Cyprus and Germany just introduced it.

2.2. The institutional features of statutory minimum wage setting systems

The mechanism used to fix the minimum wage in EU countries can be characterised along three dimensions: (1) government discretion and actors involved in the decision-making process; (2) timing of updates, including frequency and predictability of updates; and (3) criteria to be taken into account in case of an update. This section looks at these dimensions more in detail before providing a numerical characterisation of Member States' minimum wage setting regime.

2.2.1. Role of government and other actors in the decision process

There is a considerable cross-country variation in the role of the government, social partners and other actors in the decision-making process. Decisions on minimum wage levels can come from bilateral negotiations between social partners or tripartite agreements or just unilateral government decisions. In some countries, indexation to prices or wages or both are a dominant element of minimum wage setting.

Based on an extensive study of the national frameworks, three stylized models for minimum wage setting are identified on the basis of the role of government and other actors in the decision making process:

⁽²⁾ See studies by Boeri (2012); Kampelmann et al. (2013); and Schulten et al (2015). Boeri (2012) states that, especially in countries with high unemployment, governments setting a statutory minimum wage are more likely to internalise macro-economic constraints and fiscal implications of an increase as compared to parties engaged in fragmented collective bargaining. To the extent that membership is more encompassing and collective bargaining is more strongly coordinated, negotiating parties are more likely to take such constraints into account when setting wage floors.

- Institutionalised decisions,
- Indexation to prices or wages, and
- Non-institutionalised processes.

Table 1 summarises the different country cases.

Table 1: Role of the government and other actors in the decision-making process

Statutory minimum wage							
Institutionalised decisions					Indexation	Non-institutionalised decisions	Non-statutory minimum wage
Independent experts-led process	Bilateral / social partners experts led process	Gov't following tripartite consultations process	Gov't after consulting social partners	Bipartite/tripartite negotiations possible, else government decides			
EL	DE	HU	ES	EE	BE	BG	AT
IE		LT	HR	PL	FR	CZ	CY
UK		LV	RO	SK	LU		DK
		PT			MT		FI
					NL		IT
					SI		SE

Source: Own compilation based on national legislation; ILO Working Conditions Laws Database / Minimum wage fixing database.

Institutionalised decisions

The key feature here is that the decision making process is well-established with relatively specific roles for the main actors. Still, it can include markedly different variants and combine bargaining, negotiation and consultations to different extents.

For example, the process can be led by a specialised body or emphasis can be put on consultation in a tri-partite format, with the final decision taken by the public authorities. Moreover, in some countries, negotiations between social partners or tri-partite deals have priority over government intervention (e.g. Slovakia in the former case, Poland in the latter), while in others negotiations are an option but a unilateral decision by the government is possible.

Admittedly, the distinction between different models is not so neat, especially once the actual behaviour of the players is taken into account. For example, in some cases requirements on consultation may be formal with consulted actors risking not having real influence on the minimum wage adjustment; the opposite may happen where the eventual decision is carefully prepared, despite a loosely-defined process.

In the UK, an independent specialised body – the Low Pay Commission (LPC) – plays a leading role in making recommendations to the government on the annual minimum wage adjustment. ⁽³⁾ The LPC makes only recommendations, with the final decision staying with the government; yet, if the latter deviates from the recommendations it has to lay a report

⁽³⁾ The *LPC* consists of 9 members appointed by the government having a composition balanced between 3 profiles: trade unions, employers and independent experts, but all serving in their personal capacity.

before the Parliament on the reasons for such a decision. So far, the UK government has always followed the LPC proposals. ⁽⁴⁾

Ireland adopted in 2015 an approach similar to the UK's with a LPC which plays the same role as the LPC in the UK. The LPC advises the Minister, who can deviate from the LPC recommendation but has to justify his/her decision before the Parliament.

In Greece, newly adopted legislation (to enter into force as of 2017) foresees that the minimum wage will be set by the government after consultations with and advice from social partners and experts. As in the UK and Ireland, experts would play a specific role in making non-binding proposals after consultation with social partners and research institutions. In addition, consultations with and advice from social partners are foreseen as one of the steps of the procedure. Germany represents another case where a specialised body plays an important role. A committee appointed by social partners will propose updates to the level of the minimum wage. ⁽⁵⁾ The government can adopt or reject the commission's proposal, but it cannot change it. ⁽⁶⁾ The development of average wages laid down in collective agreements is a decisive benchmark to be taken into account. Overall, the minimum wage setting mechanism has a strong bargaining component owing to the bilateral nature of the social partners' committee as well as of the explicit call to take into account developments in recent collective agreements.

Tri-partite approaches with the final decision being with the government characterise the system in Hungary, Lithuania, Latvia and Portugal – in the latter, an institutionalised tripartite body has to be consulted before the government takes a final decision.

Spain, Croatia and Romania share characteristics with the previous group of countries. Yet, the consultations with social partners do not have to take place in an institutionalised setting; instead the requirement is only to consult social partners, with the approach to consultations being left to government will; only in the case of Spain does the law go further and require the government to consult the most representative social partners.

In all, broad public consultations and disclosure of information on minimum wage policies add transparency, predictability and should allow for better consideration of the possible implications of minimum wage policies. Social partners' representatives and other stakeholders are also well-suited to voice the concerns of those more directly affected. Independent experts may be well-placed to make broader economic and social considerations, including on the necessary links between minimum wage choices and other relevant policy areas and their implication for working age groups.

Rule-based indexation

⁽⁴⁾ In April 2017, the UK is introducing a National Living Wage as the pay floor for those aged 25 and over. When announcing it last autumn, the government set as objective to have it at 60% of median earnings by 2020 (GBP 9 per hour) subject to sustained growth. The path to get to such a target will still be proposed by the LPC like the wage floors for those younger than 25.

⁽⁵⁾ The committee is composed of 7 social partners' representatives and 2 no-voting advisors with academic backgrounds and proposed by social partners.

⁽⁶⁾ This process will take place with the first minimum wage update in January 2017; the initial minimum wage level that came into force in 2015 was set by the government.

In 6 Member States, minimum wage updates are largely driven by indexation to prices, wages or both. That is the case at present of Belgium, France, Luxembourg, Malta, the Netherlands and Slovenia. Often, it is also possible to make discretionary changes on top of what is due to indexation.

In Belgium, indexation to consumer prices is the key driver of minimum wage updates and widely used also for other wages, even if the exact modalities vary across sub-national collective agreements. More specifically, the minimum wage is agreed within the framework of a bi-partite national collective agreement every other year (which is automatically extended to the whole economy). A specific consumer price index – the health index - is used (excluding items like tobacco, alcohol, petrol, diesel and the impact of taxes on energy products).

Luxembourg indexes wages to headline consumer price inflation, which is triggered when inflation reaches 2.5%. By law, all wages in the private and public sectors are subject to indexation. Every two years, the government reports on changes to the overall economic conditions and incomes, and on that basis it may propose increasing the minimum wage; the law does not set a role for social partners in these decisions.

In Slovenia, the minimum wage is adjusted every year by at least the increase in consumer prices in the previous year. The exact amount of the minimum wage is determined by the labour minister after prior consultation with the social partners.

Malta has a particular system of wage indexation: each year the government issues a national standard order increasing all salaries, including the minimum wage, by an absolute amount. This fixed pay increase known as the cost-of-living adjustment (COLA) reflects the change in the retail price index applied to a reference base wage, which is somewhat higher than the minimum wage. The exact minimum wage level is set by the government after recommendations by the Employment Relations Board (which includes government's representatives as well as social partners and independent experts).

In the Netherlands, the indexation is relative to the average wage increases in recently-signed collective agreements and takes place twice a year (on 1 January and 1 July). However, there is the possibility of not updating the minimum wage rate if either the minimum wage revision implied by the average wage rise in collective agreements is considered too high with the risk of leading to higher unemployment or if the increase would lead to higher expenditure on social benefits (indexed to the minimum wage) with the risks of rising taxes or contribution to ensure financing of higher benefits.

In France, the minimum wage is linked to both price and wage developments: it should at least be indexed to the evolution of the consumer price index (for a consumption basket representative of those at the bottom 20% of the income distribution) plus 50% of the increase in the purchasing power of the wages for workers and employees. There is also the possibility of topping up – so-called *coupe de pouce* – those increases by government decision after (sequential) opinions by groups of independent experts on the minimum wage and by the tripartite collective bargaining commission where unions and employers representatives seat

(La Commission Nationale de la Négociation Collective – CNNC); the government may also submit its own report to the CNNC.

Indexation can be seen from different perspectives. It protects real wages against increases in the cost of living and may reduce uncertainty and conflict, providing a focal point for (minimum) minimum wage updates negotiations. Yet it makes real wages more rigid with negative implications for low wage employment. Real wage rigidity delays labour market adjustment in the case of temporary aggregate or permanent sector-specific productivity shocks that require, respectively, changes in aggregate or relative wages. This is an issue in particular when the minimum wage level is high and the possibility of inability to pay clauses limited or no-existent in practice. Finally, indexation can lead to wage-price spirals and make nominal shocks (e.g., a change in commodities prices in world markets) more persistent (see also European Commission, 2011).

A rigid indexation can be problematic especially when inflation is far away from the desired rate (from below or above) – risking consolidating deflationary or inflationary expectations respectively – and in times of low productivity and rising unemployment. In addition, indexing minimum wages to average wages may also be problematic, inter alia, when minimum wage earners have productivity developments different from the average.

Non-institutionalised processes

The minimum wage setting is non-institutionalised when governments can determine the adjustment of the statutory minimum wage, without any formal obligation of negotiations or consultation. In Bulgaria and the Czech Republic, the government determines the adjustment of the minimum wage without specific rules and any form of negotiations or institutionalised consultation with the social partners or with experts.

This does not mean that in other countries, notably those with more loosely defined processes, it cannot de facto boil down to unilateral government decision when bilateral negotiations did not bear fruit. At the same time, the lack of tri-partite agreements may also reflect a strategic behaviour whereby some players count more on a fall-back government decision than on consensual solutions.

The lack of transparent principles and guidelines can lead to unpredictability of outcomes. This can introduce too much volatility in minimum wages, making their setting more dependent on the electoral cycle or any other factor that steers minimum wage rates in an unchecked way instead of linked to underlying economic fundamentals. While on the one hand, in a wider discretionary framework, policy makers could be able to design the optimal policy response to unforeseen circumstances, on the other hand too much discretion may raise the risk of opportunistic decisions and no internalisation of economic constraints, with no checks and balances to foster sound decisions.

Thus, a rules-based framework forces the different players (including of course, politicians and social partners) to adhere to a consistent course of action across circumstances. Indeed, if the minimum wage setting regime is insulated from short-term electoral or other motivations,

then the outcomes of minimum wage policies can be time consistent, meaning that the policy setting makes consistent short-term (e.g. income support and poverty alleviation) and broader long-term outcomes (i.e. sustainable job creation and economic dynamism).

2.2.2. Frequency of adjustment

The frequency and predictability of minimum wage adjustments affect how sensitive the minimum wage is to a changing context, while keeping its objectives intact across times and changing circumstances. EU countries differ considerably in their frequency of revising the minimum wage (see Table 2). In most cases, the minimum wage is adjusted once a year, sometimes with precisely set calendars; in other cases, only the annual frequency is prescribed and within this group some member states, prescribe the date of entry into force of the update (often January as for instance in France, Malta or Slovenia).

Table 2: Frequency of the minimum wage adjustments

Infra-annual	Annual			Every 2 years	Other	Not specified
	<i>With set calendar and procedures</i>	<i>Only date of kick start or of entry into force is set</i>	<i>Without calendar or key dates set</i>			
NL (Jan & July)	EL IE LV PL ¹ SK	CZ FR ² HR MT SI	ES HU PT	DE BE ³ LU ³	UK ⁴	BG EE LT RO

Notes: 1: twice a year (Jan-July) if inflations exceeds 5%;
 2: (additional) automatic indexation whenever inflation exceeds 2% from the previous MW update;
 3: on the top of indexation to consumer prices;
 4: from time to time.
Source: Own compilation based on national legislation; ILO Working Conditions Laws Database / Minimum wage fixing database.

In the Netherlands, the possible update takes place every six months (January and July). Germany sets minimum wage to be revised every two years as of 2017 the same frequency as in Belgium and Luxembourg – on top of the regular indexation. In the UK, the legal provisions require irregular minimum wage updates ("from time to time"), but in practice the minimum wage is revised every October. Finally, a few countries have not set any adjustment frequency (Bulgaria, Estonia, Lithuania, and Romania).

2.2.3. Criteria to be taken into account

The criteria or parameters taken into account for minimum wage updates guide the fixing of the actual minimum pay rates. In that way, they can foster stability of the minimum wage setting process and a balanced and widely-accepted choice of criteria can help in confirming the broad objectives of the minimum wage policy.

Labour market and economic conditions, overall wages and prices developments are the most common criteria in the national legislations (Table 3). In some cases, workers' purchasing power and indexation to past inflation (in the cases of rule-based indexation) or productivity are also considered. On the other hand, social benefits or labour taxation are usually not taken into account. The same holds for minimum wage coverage.

Table 3: Criteria taken into account in the minimum wage setting process

		BE	BG	CZ	DE	EE	IE	EL	ES	FR	HR	LV	LT	LU	HU	MT	NL	PL	PT	RO	SI	SK	UK
Labour market	Employment/ unemployment/ Job creation				*		*	*							*			*			*	*	*
Broad economic situation	Economic developments and situation							*	*	*		*			*			*			*		
	Productivity						*	*	*									*	*				
	Trade, exchange rate, competitiveness, developments in trading partners						*	*				*											*
	Social benefits / Taxes and contributions / Fiscal impacts											*						*	*				
Wages and incomes	Other wages			*				*	*	*	*							*			*	*	*
	Retrospective collective-agreements wage developments				*													*					
	Purchasing power / incomes & needs of MW earners or workers / income & prices policies						*	*	*									*	*			*	
Prices	Consumer prices (other than rule-based indexation)			*			*	*			*							*	*			*	
	Indexation and /or COLA	*								*				*		*					*		
	Consumer prices (next year's)						*											*					

Overall, the requirements are not exhaustive. Minimum wage legislations make only broad reference to them without stating how these parameters have to be used in practice. For instance, there is a general reference to the need of taking into account wage developments, but only for two Member States the legislation makes a link with the outcome of collective bargaining.

2.3. Creating an indicator of institutional stringency of minimum wage setting framework

Table 4 puts together the three dimensions reviewed above (discretion, frequency of revisions, and criteria).

Based on this qualitative information, an indicator of institutional stringency has been developed. This indicator provides a measure of the restrictiveness of the decision making process. Lower values point to more flexibility, higher ones to more stringency (i.e. less room for discretion and more predictability).

Table 4: Summary of the three institutional dimensions of the minimum wage setting framework

		Statutory minimum wage						p.m.: Non-statutory minimum wage	
		Taxonomy							
		Non-institutionalised decisions	Institutionalised decisions				Indexation		
Gov't after consulting social partners	Gov't following tripartite consultations process		Bipartite/Tripartite negotiations possible, else government decides	Bilateral / social partners experts led process	Independent experts-led process				
Frequency of revision	Infra-annual						NL	AT	
	Annual	With set calendar and procedures		LV	PL		EL		CY
		Only date of kick start or of entry into force is set	CZ	HR	SK		IE	FR	DK
		Without calendar or key dates set		ES	HU			MT	FI
	Every 2 years			PT				SE	
	Other				DE			BE	
	Not specified						UK	LU	
		BG	RO	LT	EE				

0	1	2	3	4	5	6 or more
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Colour legend / number of criteria

The index is based on the conversion of qualitative information on three components of the legal minimum wage setting framework: government discretion in the decision process, timing of the update (frequency and predictability of the updating process) and the criteria used for the update. The information is collected in the course of an intensive literature review and relates to the institutional framework in place in the 22 EU Member states that have a statutory minimum wage in early 2016. The qualitative information on each of the dimensions is transformed into numbers on a scale (0-6) as indicated in Table 5.

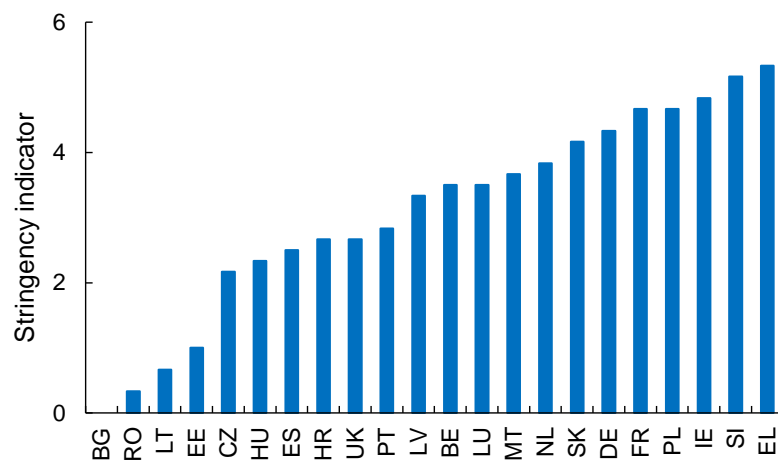
The ranking is built to reflect the degree of discretion of the government in setting the minimum wage: lower ratings are assumed to reflect more flexibility (full flexibility at the extreme) while higher readings reflect less room for discretion, in other words, more stringency. Whereas there is of course some subjectivity in this choice of indicators and their weighting, the index allows a holistic view and especially a systematic way of characterising the flexibility or stringency of the minimum wage setting. The ratings just reflect the restrictiveness of the framework and do not have a normative value attached.

Table 5: Detailed items used to compile the stringency indicator

1. Government discretion, weight: 33.3 (in %)		Ratings
Non-institutionalised decisions		0
Institutionalised	Gov't after consulting social partners	1
	Gov't following tripartite consultations process	2
	Bipartite / tripartite negotiations possible, else	3
	Bilateral / social partners experts led process	4
	Independent experts-led process	5
Rules-based indexation to past prices or wages inflation or both		6
2. Timing of update, weight: 33.3 (in %) consisting of:		
2a. Frequency of update, weight: 16.6 (in %)		
Not specified		0
Infra-annual		2
Annual		4
Every 2 years		6
2b. Predictability of updating process, weight: 16.6 (in %)		
Without set calendar		0
Only data of entry into force is set		3
With set calendar (and procedures)		6
3. Number of criteria called for a decision on the update, weight: 33.3 (in %)		
0		0
1		1.5
2		3
3		4.5
4		6

Graph 3 presents the value of the indicator for the EU Member States with a statutory minimum wage. On the basis of this indicator, the minimum wage setting process is more tightly regulated in Greece, Slovenia, Ireland, France and Poland. In contrast, it is the most flexible (i.e. less predictable) in Estonia, Lithuania, Romania and Bulgaria.

Graph 3: Indicator for the stringency of the minimum wage decision-making framework



Intermediate values of the indicator may reflect a trade-off between the different dimensions of the indicator with stringency or flexibility in one or two dimensions being offset by stringency or flexibility in other dimensions.

3. Effects of the institutional stringency of the minimum-wage setting framework: *prima facie* evidence

This subsection provides some *prima facie* evidence on the determinants and effects of the institutional stringency of the minimum-wage setting framework. Graph 4 shows the relationship between stringency and the Kaitz index (i.e., the level of the minimum wage as a ratio of the average wage). At a first glance, countries with higher minimum wages (in terms of the Kaitz index) have more rigid minimum wage setting systems. ⁽⁷⁾

⁽⁷⁾ The correlation coefficient between the Kaitz index and the indicator of institutional stringency of the minimum wage setting system is 0.5. Moreover, about ¼ of the difference across countries in the Kaitz index is explained by the indicator of institutional stringency. These are simple correlations, which do not provide any information on the causality.

Graph 4: Correlation between the stringency indicator and the level of the minimum wage

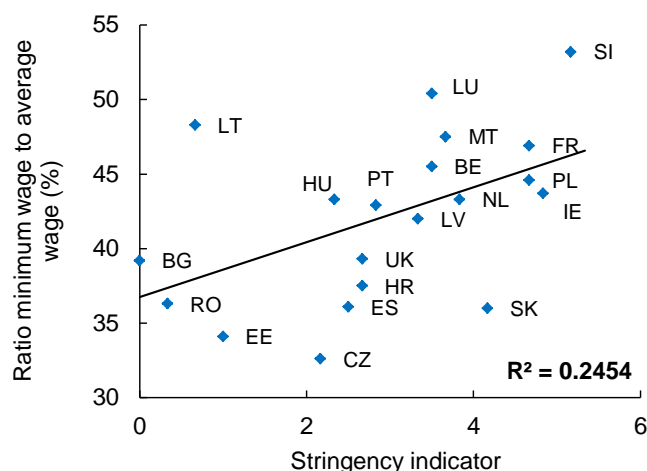


Table 6 shows the correlation between the Kaitz index and various sub-components of the minimum wage stringency index. Only the correlation with government discretion (0.7) is statistically significant, while the other categories have small but statistically insignificant values. A positive correlation implies that the minimum wage is higher (relative to the median) when there is limited discretion by the government (i.e. or the minimum wage setting is mainly rule based).

Table 6: Correlation among sub-indices of indicator of minimum wage setting stringency and with Kaitz index

	Flexibility of Minimum wage setting regime - sub-indices			
	Government discretion	Frequency of Update	Predictability	Criteria called for a decision
Government discretion	1			
Frequency of Update	0.4	1		
Predictability	0.2	0.4	1	
Criteria called for a decision	0.3	0.5	0.6	1
Kaitz index	0.7	0.3	0.04	0.2

Notes: High values of the Kaitz index imply a high minimum wage as percentage of the median wage. For sub-indices of minimum wage stringency, a low value means high discretion, low frequency and predictability of updating, and a low number of criteria to be considered when updating the minimum wage.

The high correlation between the Kaitz index and the overall index of institutional stringency of the minimum wage setting is driven by the high correlation with the sub-complement government discretion in minimum wage setting. The relation between low government discretion and high levels of the minimum wage is influenced by the fact that the Kaitz index is high in countries where updates of the minimum wage occur mainly via indexation (e.g., Slovenia, Luxembourg and Malta). In addition, with intermediate degrees of institutionalisation, having more players and less discretion might lead to more moderate

minimum wage changes as the interest of wide groups of workers are taken into account. Thus, in cross-country comparisons more rule-based minimum wage updating systems lead to a higher Kaitz index. ⁽⁸⁾

Table 7 explores how the increase of minimum wage responds to changes in underlying macroeconomic variables (column 1) controlling for the political cycle (column 2) and for the characteristics of the minimum wage setting process identified on the basis of the stringency indicator (columns 3-10). ⁽⁹⁾ Values of the indicator below median represent regimes where the discretion in setting minimum wage is relatively high and the predictability low. A number of facts emerge from these estimates based on a panel of EU countries.

Table 7: Determinants of minimum wage changes

Dependent variable: Minimum wage growth	(1)	(2)	Countries with Institutional stringency index							
	Basic specification	Years following legislative elections	higher than median	lower than median	higher than median	lower than median	higher than median	lower than median	higher than median	lower than median
Average wage growth	0.39 *** (0.13)	0.48 *** (0.23)	0.013 (0.16)	0.49 *** (0.17)	0.012 (0.16)	0.55*** (0.18)	0.019 (0.15)	0.48 *** (0.17)	-0.20 (0.13)	0.58*** (0.16)
average wage growth in the year following elections									0.89*** (0.16)	-0.09 (0.32)
Consumer price inflation	0.39*** (0.13)	0.28 (0.23)	1.03*** (0.15)	0.29 * (0.16)	1.02*** (0.16)	0.16 (0.17)	1.03*** (0.15)	0.28* (0.16)	1.3 *** (0.15)	0.12 (0.16)
Consumer price inflation in the year following elections					0.013 (0.11)	0.13 (0.08)			-1.14 *** (0.21)	0.21 (0.81)
Lagged employment growth	0.33*** (0.12)	0.015 (0.27)	0.22** (0.11)	0.35 * (0.18)	0.22** (0.12)	0.33* (0.18)	0.44*** (0.13)	0.15 (0.23)	0.30 *** (0.12)	0.14 (0.23)
Lagged employment growth in the year before the elections							-0.48*** (0.17)	0.60*** (0.35)	-0.32*** (0.16)	0.52 (0.35)
Constant	0.021 *** (0.004)	0.028 *** (0.007)	0.015 *** (0.004)	0.028 *** (0.004)	0.015*** (0.004)	1.3*** (0.63)	0.013 *** (0.004)	0.028 *** (0.004)	0.015 *** (0.004)	0.029 *** (0.005)
Observations	383	103	192	163	192	163	192	163	192	163
R-squared	0.80	0.85	0.72	0.82	0.71	0.83	0.72	0.82	0.77	0.83
Number of countries	18.0	18.0	9.0	8.0	9.0	8.0	9.0	8.0	8.0	8.0

Notes: (1) Robust standard errors in parentheses. (2) Asterisks mark estimated coefficients which are statistically significant at the 10% (*), 5% (**) or the 1% level (***). (3) The sample includes Belgium, Czech Republic, Estonia, Spain, France, Hungary, Ireland, Lithuania, Luxembourg, Latvia, Netherlands, Poland, Portugal, Romania, Slovenia, Slovakia and the UK. (4) Wage growth is measure by the rate of change of nominal compensation per employee.

Minimum wage changes reflect, with approximately the same weight, changes in wage growth, consumer price inflation, and in the employment conditions (column 1). Controlling for the political cycle, as captured by the year of the elections, modifies the relative importance of the underlying macroeconomic conditions for minimum wages updates.

This is visible from the larger effect of wage growth and the lower impact of consumer price inflation (which also statistically insignificant, i.e. imprecisely estimated) (column 2). Thus, in electoral years governments take more into account redistribution (i.e. the wage distribution becomes more compressed when the minimum wage increases);

Columns 3 to 10 look more in detail at various specifications splitting the sample on the basis of value of their indicator of stringency of their minimum wage setting regime. The

⁽⁸⁾ Yet the correlation between the relevant institutional indicator and the Kaitz index is not statistically significant. Less compelling is the evidence for the other characteristics.

⁽⁹⁾ The political cycle is identified as a binary variable that equals 1 in the year of election and 0 otherwise. It is obtained from the Database of Political Institutions 2015 update Cruz et al. (2016). The effect in the year that follows elections is obtained lagging the dummy variable by one year.

framework used to revise the minimum wage influences the size of its average change – visible from the size of the constant - and the relative weight of the variables usually taken into account for its update. Rules-based systems have an underlying growth of the minimum wage which is half as much as the average growth in more discretionary minimum wage setting frameworks.

Relative high government discretion in minimum wage setting raises the effect of average wage increase and of employment growth on minimum wage updates. Thus, distributional concerns and the overall growth of employment take a prominent role in the decision of changing the minimum wages, when governments have more direct control of their setting; with these effects becoming more important in electoral years (columns 3-10).

4. Macroeconomic effects: A general framework

As evidenced in previous sections, the employment effects of minimum wage are often elusive, resulting in imprecise estimates for many working age groups. This may happen for a number of reasons. Low shares of minimum wage workers, low price elasticity of the product demand and low substitution with respect to other inputs may cause a weak response of labour demand to minimum wage changes. Thus, even when the average wage changes in response to minimum wage updates, the estimates of the employment effects may be small and highly uncertain (Manning, 2016, Cahuc et al 2014).

Accounting for the possible interactions between minimum wage, average wages, employment and consumption, including the lagged effects of these variables on minimum wage and of the latter on the former, provides a better representation of the relation linking minimum wages to employment.

4.1. Data and econometric approach

In this section, a general specification is adopted to estimate the employment effects of minimum wage increases. A Vector Auto Regressive (VAR) model is a standard tool to take into account dynamic interrelationships between variables of interest. In particular, the aim is to assess the response of employment, wages and consumption to a discretionary minimum wage change (henceforth *shock*). One limitation of VAR is that the response to a shock is linear in the shock, i.e. it does not take into account the possibility of thresholds effects. This technical limitation is quite relevant as there is a consensus that negative effects on employment may emerge at high levels of minimum wage.

A VAR with 1 lag has been estimated for the following variables: the minimum wage level, the median wage, the total number of employees, the consumption-GDP ratio. ⁽¹⁰⁾ Excluding the self-employed helps to control for the effects of minimum wage on total employment stemming from substitution between employees and self-employed. The median wage is chosen instead of the average wage as the former is more stable with respect to changes in the

⁽¹⁰⁾ All variables are in logs; the panel is estimated with GMM method.

extreme values. Consumption as a percentage of GDP captures the effect of minimum wage on consumption, while netting out the effect of trends in total expenditure.

Annual data are used to estimate a VAR model using the panel of available countries over the period 1985-2015; the panel is unbalanced. Panel VAR allows considering the interactions between the variables, while controlling for heterogeneity across countries in the level of variables. The analysis will describe the impulse-response functions, which show the dynamic response of one variable of interest (wages, employment, consumption) to a shock in the minimum wage. Shocks are identified based on the assumptions that a minimum wage shock affects the median wage, employment and consumption within the same year, while it responds to a shock to one of these variables only with a lag of 1 year. ⁽¹¹⁾ Within the same year, wage shocks affect both employment and consumption, while shocks to these may affect wages with lag only. The causal structure implies that the minimum wage is the most exogenous variable, while consumption is the most endogenous.

Next, the availability of indicators describing the institutional flexibility of the minimum wage setting allows exploring whether the regime for minimum wage setting affects the response to discretionary minimum wage changes. The sample is split in two groups based on the median of the sub-components of the indicator describing the institutional flexibility of the minimum wage setting framework. In practice, countries are divided in two samples on the basis of predictability and frequency of discretionary changes in the minimum wage and the impulse responses are compared for the two groups. Two groups are formed according to whether the indicator of predictability and frequency of updates has value below or above the median; we called the first group *low* and *high* predictability. ⁽¹²⁾

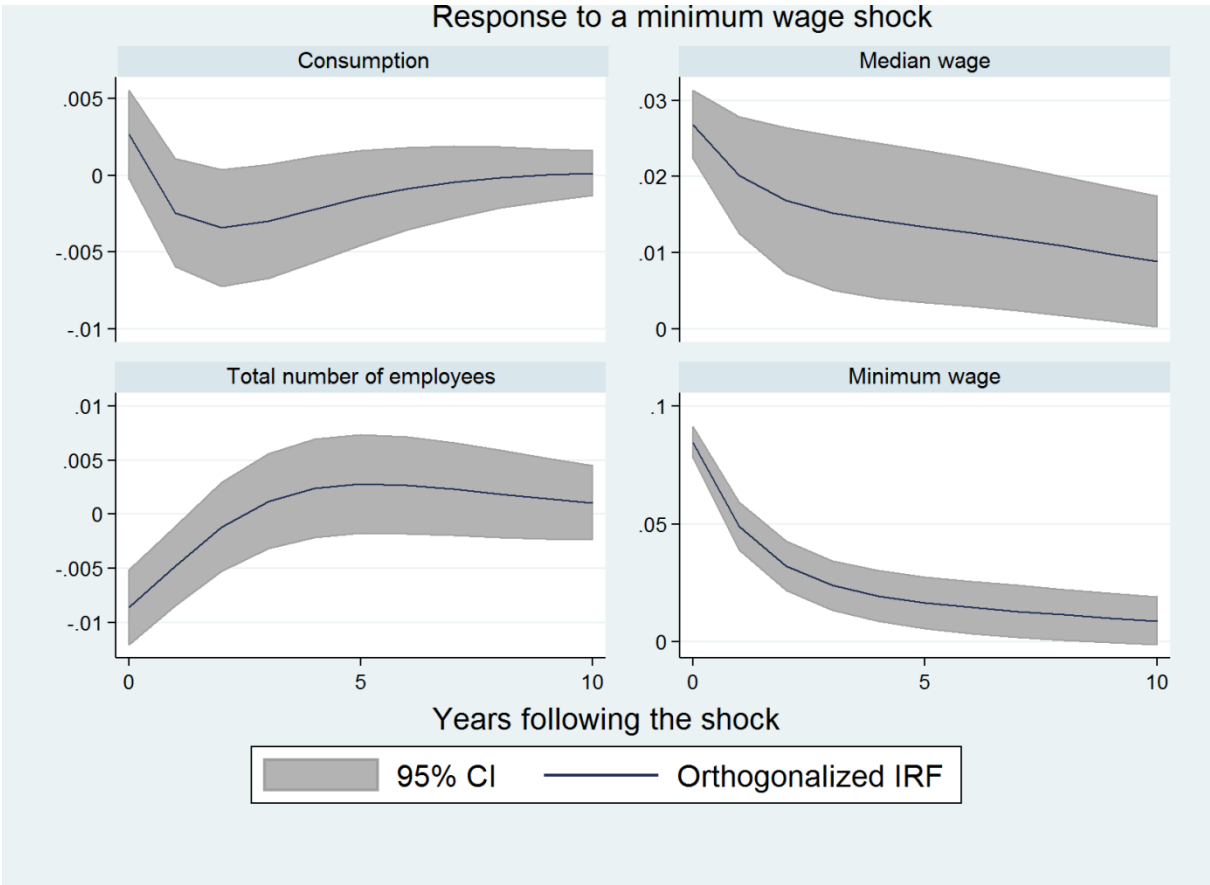
4.2. Results

Graph 5 shows the responses of the median wage, total number of employees and consumption to one-standard-deviation positive shock to the minimum wage; the panel with the minimum wage response displays the persistency of the minimum wage shock. In the chart, the horizontal axis represent years after the shock, while the vertical the changes in the variable of interest. Bands represent the confidence interval, so that all values within the bands have the same probability. When the band includes zero, the estimated values are considered statistically non different from zero.

⁽¹¹⁾ By orthogonalising the impulse response, it is possible to identify the effect of a shock while keeping the other shocks equal to zero. Shocks are identified with Choleski decomposition of the variance-covariance matrix of reduced form residuals with the order: minimum wage, median wage, employment and consumption.

⁽¹²⁾ Countries belonging to the first group include Bulgaria, Estonia, Lithuania, Romania, UK, Spain, Hungary, Portugal, Netherlands; Belgium and Luxembourg coincide with the median.

Graph 5: Response to a minimum wage shock



Notes: The horizontal axis represents years after the shock. The vertical axis represents log points. Bands represent the 5% confidence interval generated by Monte Carlo simulations. When 0 is included in the confidence band, it cannot be excluded that the effect is zero.

The results suggest the following: A minimum wage shock results in a variation of median wages, consumption and employment within the same year; the size of the minimum wage shock is about 10%. The shock is the minimum wage change not explained by past changes in the underlying variables, and can be interpreted as discretionary change.

Employment falls by less than 0.1% within one year, while the median wage rises by 0.3%. Consequently, the small increase in consumption by 0.03 reflects the offsetting effect of a temporary decline in employment and increase in median wage. This suggests that the increase in consumption for those in employment after the increase in the minimum wage offsets its fall for those who have lost a job after the increase of the minimum wage. ⁽¹³⁾

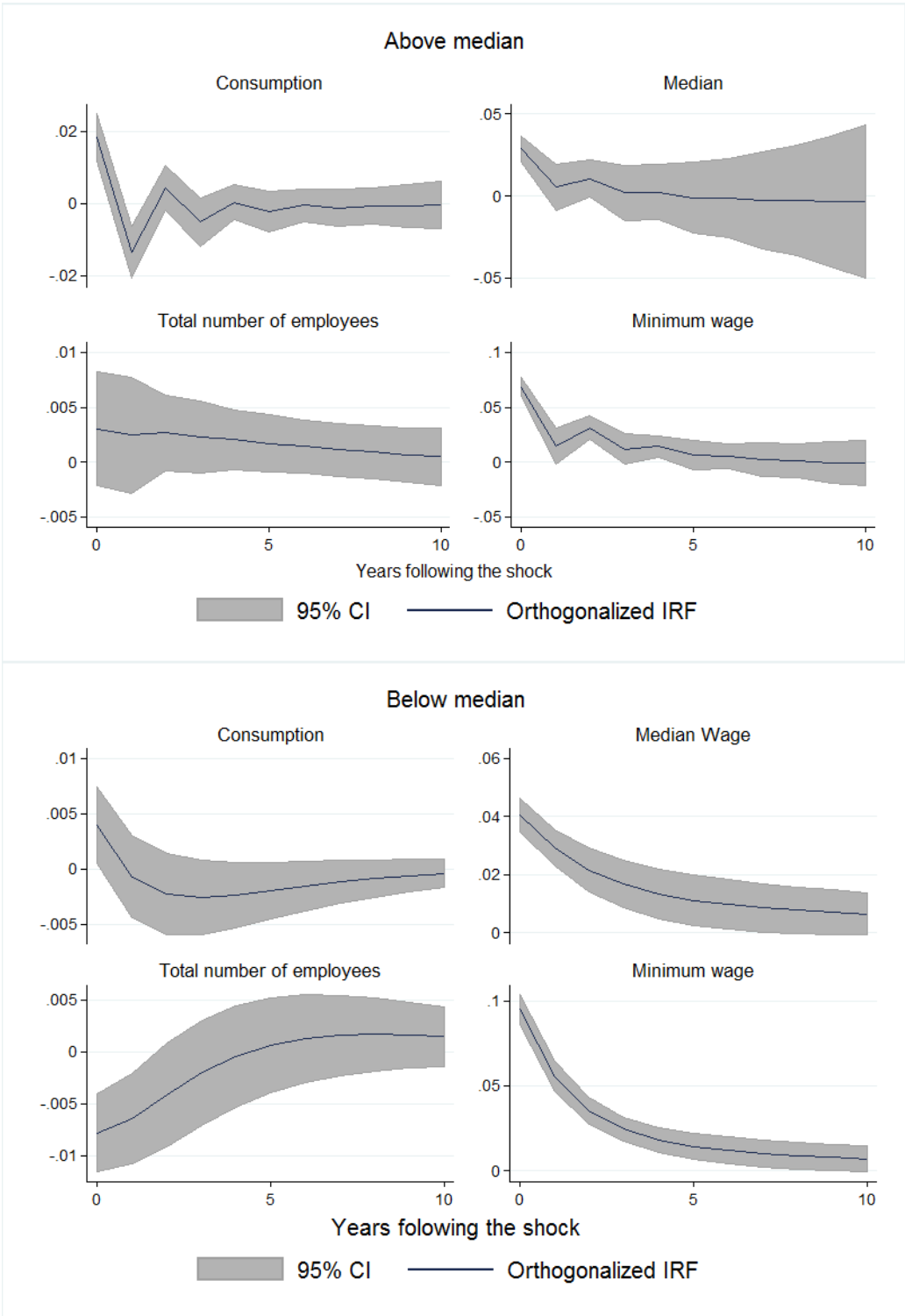
The effect on employment and consumption dissipates quite quickly. In contrast, the effect on median wages is more persistent. Thus, the minimum wage is quite effective in improving the wage distribution at the cost of small and transitory negative effects on employment.

⁽¹³⁾ Another other offsetting factor may include the effect of increasing the minimum wage on consumption those that were unemployed before the increase.

Graph 6 reports the dynamic response of employment, consumption and the minimum wage, splitting the countries on the basis of the frequency of updates and predictability of minimum wage changes. On impact, the response of consumption is higher in the group with low predictability and frequency of updates; but the effects die out rapidly with no major differences across the two samples. The median wage increases on impact in response to the minimum wage in both samples; the pattern of response is very similar, although the median wage rises more (i.e. the wage distribution becomes more compressed) for the group with low predictability and frequency of minimum wage updates.

Finally, in response to a minimum wage shock, employment drops temporarily in countries where changes in the minimum wage are infrequent and unpredictable, while it remains unchanged in the rest of the countries. Thus, it is likely that whenever minimum wage changes are predictable and frequent, the size of discretionary minimum wage changes (i.e. unexpected shock) is smaller than in countries where the minimum wage policy is more *erratic*. This is visible in the size of the shock which is higher in the former group of countries. Thus, unexpected changes of minimum wage reduce the gap between low and median wages; yet, the bigger size of the shock in countries with less frequent and predictable minimum wage changes lowers (temporarily) employment. Thus, minimum wage policy is better attuned with the underlying macroeconomic variables in countries where minimum wage changes are predictable.

Graph 6: Response to a minimum wage shock for two groups of countries separated by the value of the stringency indicator – countries above the median have more rule-based minimum wage setting systems, while countries below the median have more discretionary systems



Notes: The horizontal axis represents years after the shock. The vertical axis represents log points. Bands represent the 5% confidence interval generated by Monte Carlo simulations. When 0 is included in the confidence band, it cannot be excluded that the effect is zero.

5. Conclusions

Statutory minimum wages are a policy tool to guarantee a *fair* wage for those in low pay jobs and address cases in which workers are in a weak bargaining position. As evidenced by this chapter, the minimum wage is an effective tool to improve distribution and support consumption of low wage earners, with small negative effects on employment that disappear over time.

EU countries differ in their minimum wage setting regime. Differences concern not only the level of minimum wage as proportion to the average wage, but also its institutional setting for minimum wage updates. Differences are considerable in the role played by the government and factors taken into account when adjusting the minimum wage. Systems where governments can reset the minimum wage without early consultation of social partners and other stakeholders and clear criteria may allow responding to unexpected shocks, but at the cost of making the updating unpredictable and at the mercy of the electoral cycle. Irregular increases of the minimum wage may lead to larger revisions than more regular and gradual updates. Rule-based systems reduce the *political bias* and, being *predictable* and *transparent*, allow employers and employees to make their plans. Yet, rule-based systems may introduce real wage rigidity for low wage earners and lead to excessive rippling (spill over) effects on wages close to the minimum.

A properly designed institutional setting has to balance the need of achieving the objectives of a minimum wage policy with the uncertainty that an unclear and unpredictable framework may entail. Moreover, institutional arrangements that allows some flexibility in the minimum wage setting policy (e.g. through inability-to-pay clauses or consensual suspensions of minimum wage payments by bipartite or tri-partite agreements) could provide the additional lever to deal with shocks that hit the most vulnerable more strongly.

The chapter leaves open a number of questions that may be taken on for future analysis. First, the minimum wage is one policy lever to reduce in-work poverty and redistribute income. The design of the tax and benefit system and the availability of in-work benefits can also be alternative tools. The relative effectiveness of these two policy levers will have to be assessed against the design of minimum wage policies and the tax and benefit systems. Second, the effect of the minimum wage on profits, in particular of companies employing a large number of low-wage workers, is less prominent. The study of the effect of minimum wage on profitability is relevant to determine the role of the minimum wage in determining international costs competitiveness.

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