

Why is Tunisia's unemployment so high? Evidence from policy factors

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Abstract

Tunisia has one of the highest unemployment rates within the Middle East and Central Asia. We look at the extent to which institutional factors explain those high unemployment levels. We also assess unemployment cyclicalities, by looking at the determinants of labor market sensitivity to the output gap. We find that during the last decade the deterioration of institutional factors that affect labor demand not only explain about a quarter of the unemployment rate increase in Tunisia, but also Tunisia's excess sensitivity of unemployment to the output gap. Our results suggest that an improved business environment and product market competition, increased labor market flexibility as well as reduced financial constraints and informality would help reduce Tunisia's unemployment.

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I. INTRODUCTION

With unemployment reaching 16.2 percent in the first quarter of 2023, Tunisia has one of the highest unemployment rates within the Middle East and Central Asia region, with substantial disparities related to gender, age, and regional dimensions (Figures 1.1 to 1.4). The young, recent graduates and households falling into the lowest income deciles are more likely to be unemployed. For the youth between 15 and 29 years, unemployment also appears negatively correlated with education levels and is more pronounced for males than for females (World Bank, 2023). These relatively persistent disparities - each with significant social impact- are indicative of the challenges that the Tunisian economy faces, not only to absorb its young and growing labor force, but also to provide new opportunities for its stock of long-term unemployed. This calls for an urgent and adequate response to tackle Tunisia's high and persistent unemployment.

On the labor supply side, Tunisia is suffering from structural bottlenecks. This includes the stark duality of its labor market, with informal employment accounting for more than 60 percent in some sectors (Figure 1.5). Informal employment is strongly associated with the level of education, as informality seems prevalent among non-graduates (IMF, 2022), with 80 percent of the informal workforce having only reached a primary or a secondary education level, and 10 percent being illiterate (World Bank, 2014). Self-employment of the young is also common and informal, especially in rural areas (World Bank, 2014). On the other hand, the large cohorts of university graduates tend to be unemployed rather than working in the informal sector. As the wage grid and social benefits in the public sector on average tend to be higher than for the equivalent positions in the private sector, especially for entry level positions, 78 percent of new graduates would also rather wait for a public sector job, rather than accept a job in the private sector (TLMPS, 2014). The existence of this "wage premium for public jobs" of about 40 percent would provide incentives to "queue" for public sector jobs and raise the reservation wage in the formal private sector (World Bank, 2023).

On the labor demand side, several distortions are potentially at play. These include the low productivity and competitiveness of the Tunisian private sector, which has resulted in a low potential growth during the last decade. The manufacturing and service sectors (19 and 52 percent of the labor force, respectively) continue to lead job creation and employment. However, they are far from being the most productive sectors. Conversely, sectors with potentially a higher productivity are either regulated or dominated by state owned enterprises, which does not help to develop the private sector and thus employment (figure 1.8). In addition to the low productivity, institutional factors have also been identified by the literature as potentially having a significant effect on the dynamics of the labor market. These factors include the employment protection legislation, wage bargaining system, product market regulation, access to finance and taxation.

The aim of this paper is to address to what extent those institutional factors explain the unemployment level and its evolution in Tunisia during the last decade. Furthermore, as Tunisia is a small open economy, with a high share of international trade and a sizeable informal sector, we also look at unemployment cyclicity, by identifying the determinants of the labor market

sensitivity to the output gap³. Assessing the impact of institutional factors on the Tunisian labor market is important for two main reasons:

- First, as Tunisian labor regulations have not changed since the 1990s, and with institutions potentially explaining differences in employment dynamics (Blanchard and Wolfers, 2000), stepping back and assessing the impact of institutional factors on employment in the current context would not only be useful to address challenges that the Tunisian labor market faces, but also novel in the case of Tunisia.
- Second, our analysis seeks additional insights on the linkages between different types of regulations and policies, and thus a broader view on potential solutions in the context of high and persistent unemployment.

For Tunisia more specifically, among different structural and policy factors that could affect the labor market, the literature has focused more on the linkages between unemployment and supply related factors, including skill mismatches (Boughzala, 2017; Assad and Boughzala, 2018; OECD, 2021) and wage subsidies (e.g., Marouani, 2010; WB, 2014). The literature has also examined, to a lesser extent, the role of labor market regulation in influencing unemployment trends (Boughzala, 2017; EMNES, 2018).

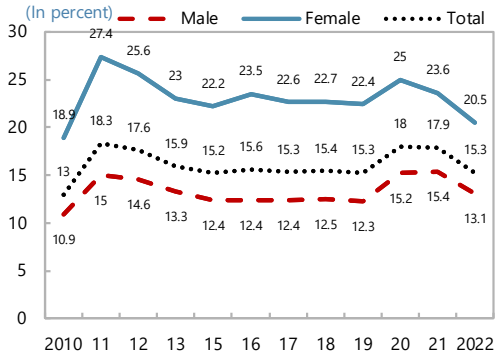
To our knowledge, this is the first study that attempts to fill the gap in the literature by exploring the relationship between the Tunisian labor market and a broad set of institutional factors simultaneously. Specifically, we aim at measuring the impact of demand-side institutional and policy distortions on Tunisia's high unemployment during the last decade. We also explore the linkages and interactions between factors, rather than studying them separately, in a comprehensive and broad approach.

The remainder of the paper is as follows: the second section gives an overview of the literature on the impact of institutional factors on the labor market. Section 3 assesses the relative institutional factors' contribution to the unemployment in Tunisia during the last decade. Section 4 presents to what extent institutional factors explain unemployment's sensitivity to business cycles in the Tunisian context.

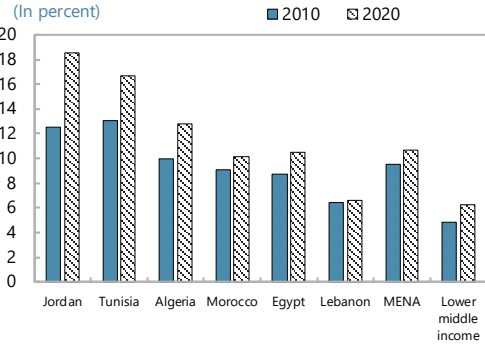
³ IMF (2022) shows that countries in North Africa with a high level of informality tend to have more cyclicalities of the labor market response to business cycle fluctuations. This paper looks, in addition, to the impact of institutional factors on employment cyclicalities in the case of Tunisia.

Figures 1.1 to 1.8: Tunisia: Labor Market Indicators

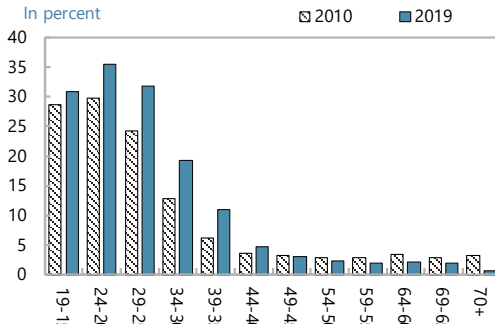
Unemployment rate by gender



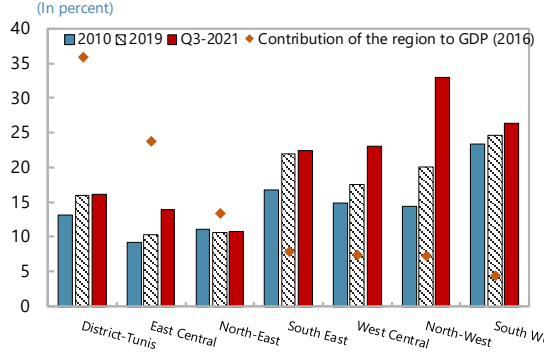
Unemployment rate: a comparison with peers



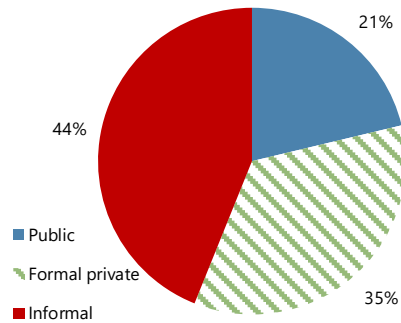
Unemployment rate by age group



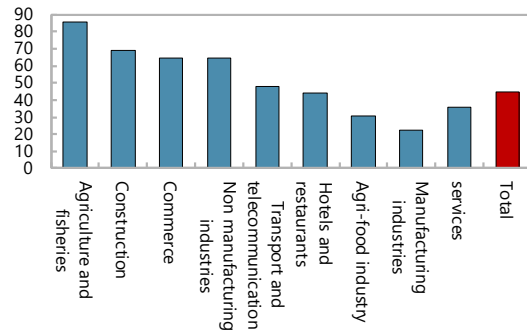
Unemployment rate by region



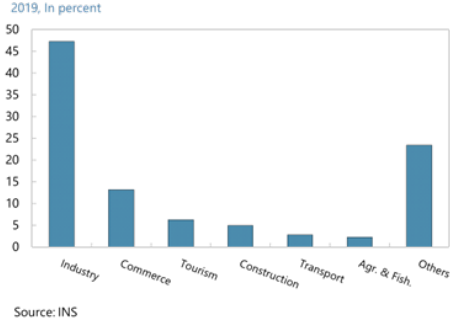
Job composition
(2019, in percent of total employment)



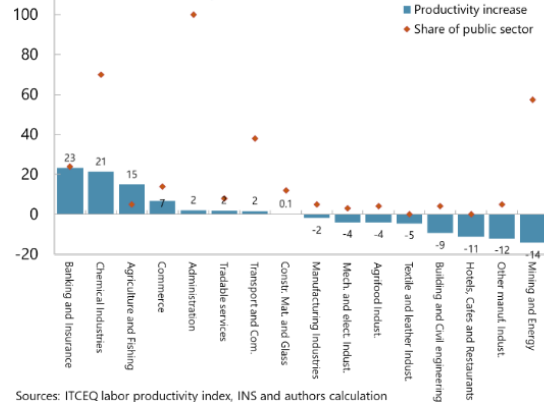
Share of informal employment
(Q4-2019, in percent)



Share of formal employment per sector



Productivity increase between 2012 - 2019 (%)



II. LITERATURE REVIEW

Economic studies have looked at several demand-side institutional determinants of unemployment, with the main ones being labor market regulation, including wage bargaining system, product market regulation and access to finance:

- *Employment protection legislation (EPL)*: Finding an equilibrium between protecting workers and the efficiency of the labor market is important for supporting growth and enhancing labor market dynamics. EPL is generally used to ensure job protection, increase stability while improving working conditions, and protect workers' welfare (OECD, 2013). EPL protects workers from firing and gives insurance against dismissal, especially in the presence of financial market imperfections (Pissarides, 2010). It can also help managers invest in human capital and thus enhance firm productivity (Hatayama, 2022). However, when it is excessive, EPL can limit employers' ability to efficiently adjust the workforce, thereby causing labor market distortions. This is more pronounced in industries characterized by rapid technological change. Furthermore, excessive EPL could increase the cost of formal employment, which in turn increases informality and unemployment (Boughzala, 2017).
- *Wage bargaining system*: The literature has identified a hump shaped relationship between unemployment and the degree of wage bargaining centralization (Calmfors and Driffills, 1988; Bassanini and Duval, 2006; Jaumotte, 2011). In a centralized system, unions internalize better the negative impact of excessive wage pressures on employment. On the other hand, the small bargaining power of unions in a fully decentralized negotiation system, coupled with market discipline, could reduce wage claims, thus helping preserve employment. In such circumstances, the intermediate bargaining system would tend to display the worst outcomes. First, as it does not benefit from both advantages of the aforementioned systems (Bassanini and Duval, 2006). Second, as the strong bargaining power of unions tend to increase wages above productivity, resulting in poor employment performance. Third, with negotiations taking place at the sectoral level, competition in product markets can be limited, as negotiations tend to lead to more harmonized wages at the sectoral level and the competition between firms offering close substitutes cannot be at play (European employment observatory, 2011). Hence, the intermediate bargaining system, coupled with a stringent employment protection legislation could constitute an entry barrier, hampering a more rapid development of the private sector.
- *Product market regulation*: The impact of product market regulation on the labor market is ex ante unclear. On the one hand, a lighter product market regulation has a positive effect on employment as it (i) lowers entry barriers, boosts activity level and employment demand, (ii) boosts real wages via lower prices, which stimulates labor supply and (iii) lowers market rents which reduces wage claims and therefore the gap between productivity and real wages. On the other hand, a high level of competition may reinforce the bargaining power of employees, leading to an increase in employment costs and consequently the unemployment rate (Jaumotte, 2011).
- *Access to finance*: Interactions between labor and financial markets imperfections have also an impact on employment. In a market with labor imperfections, i.e., hiring and firing costs as well as weak flexibility, financial development allows firms to finance labor adjustment costs more efficiently as (i) firms become less dependent on internal financial sources, and (ii) financial development could lead

to more competition in the credit market (Gatti et al 2012, Rendon, 2001). On the other hand, when financial imperfections exist, making the labor market more flexible has a strong impact on employment, as the removal of labor adjustment costs would free firms from financing them (Rendon, 2001).

- *Taxation*: The impact of taxation on unemployment rates is ex ante ambiguous: In a perfectly competitive labor market, a tax wedge increase would be fully transmitted into lower net wages, leaving the unemployment rate unchanged (Bassanini and Duval, 2006). However, in countries with powerful trade unions and intermediate wage bargaining system, coupled with a stringent labor market regulation, higher taxes would be transmitted into higher real wages, which in turn would lead to a decrease in labor demand. The literature is more conclusive about the impact of taxation on informality, as it shows that an increase in the tax wedge generates disincentives to work formally, amplifying further the dual market problem (Bassanini and Duval, 2006). IMF (2022), for instance, points out that the reduction in corporate tax rates (from 45 to 22.5 percent) as well as the automation of tax collection and declaration have partly contributed to the decrease of informality in Egypt between 2005 and 2017.

III. THE CONTRIBUTION OF POLICY AND INSTITUTIONAL FACTORS IN EXPLAINING TUNISIA'S UNEMPLOYMENT RATE

These policy and institutional determinants are likely to be important factors in the evolution of the labor market in Tunisia. Drawing on the recent literature, this section assesses to what extent those factors explain the unemployment level during the last decade.

First, we focus on a panel of 157 countries during the period 2007-2017⁴ and then try to extract the impact of policy factors on the Tunisian labor market. Specifically, our first step is to estimate a panel regression including, in addition to the lagged unemployment rate (to control for unemployment persistence), the output gap (denoted "Gap", the difference between the real GDP and the HP filter of the real GDP⁵, as percent of the latter), a proxy of labor market regulation ("Labor"), the degree of centralization in wage bargaining ("Barg" and its square, to allow for nonlinearity as explained in section II), business regulation ("Bus"), financial market regulation ("Fin") and taxation ("Tax"). As the small-time dimension used would lead to potential biases in estimation (especially in the presence of a lagged variable), we also use the Arellano-Bond GMM dynamic model with one lag instrumental variables.⁶ :

$$U_{i,t} = \alpha U_{i,t-1} + \beta Gap_{i,t} + \gamma Labor_{i,t} + \delta Bus_{i,t} + \theta_1 Barg_{i,t} + \theta_2 Barg_{i,t}^2 + \sigma Fin_{i,t} + \vartheta Tax_{i,t} + \mu_i + \tau + \varepsilon_{i,t} \quad (1)$$

⁴ As some of the series used in this part are only available during this time period.

⁵ The HP filter is used with a standard smoothing parameter of 6.25 for annual data.

⁶ Results of the Arellano-Bond estimation are available upon request and show a slightly lower coefficient for the lagged unemployment and a bit higher coefficient for the output gap than the OLS fixed effects estimation. For institutional factors, the overall results are quite similar. This would confirm the overall result presented in this section with respect to unemployment persistence and the impact of institutional factors on unemployment.

Where μ_i and τ represent country and time fixed effects, respectively. Details of the data used are in Annex 5. Table 1 presents several specifications including different variants of the variables below, extracted from a wide range of sources to check robustness⁷. Some of the estimations also include sub-indicators to finetune the results and allow for the identification of policies having a significant impact on the unemployment rate⁸.

Estimation results show that policies and regulations related to the labor market, the product market, and financial development seem to significantly affect the unemployment rate:

- A greater flexibility in the product market is associated with less unemployment. Looking more specifically at labor market policies however, we find that it is mostly firing procedures and costs that are having a significant impact on the unemployment level: specifications 2 to 5 show that the latter increases with augmented severance payments, or more stringent dismissal procedures. Product market flexibility including through competition intensity, combined with less burdensome administrative costs are associated with a lower unemployment rate.
- The flexibility of credit market regulations seems also to affect the unemployment rate significantly and negatively.
- However, results do not show a significant direct effect of wage bargaining on the unemployment level. As lagged unemployment - which reflects the persistence of the unemployment - is significant, wage bargaining could affect indirectly the current unemployment level. This would be by increasing the persistence of unemployment, given that insiders (currently employed) could directly influence the wage bargaining system and thus, lead to an increase in the level of the natural unemployment rate (O'Shaughnessy, 2011; Blanchard and Summers, 1987).
- Estimation results also do not show any significant impact of the level of taxation on unemployment. With the latter considering employment in the informal sector, the literature shows that a burdensome tax system increases the cost of formal work, which in turn could affect informality, rather than the unemployment level⁹ (IMF, 2022 for North Africa).

⁷ A brief description of the indicators as well as their sources is given in Annex 5

⁸ Given that in countries with low female labor force participation, like many in the Middle East and North Africa, the unemployment rate may be an imperfect indicator of the health of the labor market, we also conducted separately regressions using the labor force participation rate with results of similar interpretation.

⁹ This result may seem somewhat surprising but could also be due to the use of a measure of tax burden that encompasses all government taxation rather than taxation on labor and/or firm profits only. We conducted the same regression (1) to (6) in table 1 using alternative measures of taxation, i.e., profit tax as a percentage of total profits, and labor market taxation from the World Bank Doing Business data. Results, available upon request, do not show any significant impact of both measures on the unemployment rate, which is in line with the main hypothesis developed here.

For Tunisia, while the output gap and the persistence of unemployment explain most of the increase in the unemployment rate between 2009 and 2017, changes in institutional policy factors explain about a quarter of it:

- Based on specification 4 and 6 (Table 1 and figures 2.1 and 2.2), about 20 percent¹⁰ of the increase in the unemployment rate in Tunisia during the last decade would be attributable to the deterioration of product markets and 5 percent is due to the credit market conditions. During the same period, the de jure employment protection legislation (ILO indicator) is unchanged, which explains its lack of impact on the unemployment change in the estimation.
- The rest of the increase in unemployment would mostly be explained by the output gap, as well as the persistence of unemployment¹¹.
- The importance of the lagged unemployment contribution in the model goes in tandem with the hypothesis of relatively long-lasting persistence in unemployment caused by economic shocks. Blanchard and Summers (1987) distinguish between two groups of workers: insiders (currently employed) and outsiders (unemployed). With unemployment increasing, the number of insiders would diminish, and the number of outsiders increase. However, the bargaining system would play an important role in maintaining the gap between both groups, and hence an increase in the natural unemployment rate.
- the impact of institutional factors on the increase of unemployment in Tunisia between 2009 and 2017 is more pronounced for males than for females and youths (Figures 2.6 to 2.8). This suggests that female and youth employment in Tunisia are more influenced by economic cycles.

¹⁰ This is calculated as the share of product market regulation change in total unemployment change between 2009 and 2017, and not as the marginal impact of product market regulation on unemployment.

¹¹ Lagged unemployment can capture all other factors that could have an impact on unemployment rate.

Table 1: Institutional determinants of unemployment

VARIABLES 1/		(1)	(2)	(3)	(4)	(5)	(6)
		Unemployment rate					
Employment protection legislation	Lagged Unemployment	0.5664*** (0.0376)	0.6030*** (0.0335)	0.6063*** (0.0398)	0.5817*** (0.0407)	0.5721*** (0.0450)	0.6947*** (0.0343)
	Output gap	-0.0769*** (0.0207)	-0.0765*** (0.0168)	-0.0800*** (0.0186)	-0.0767*** (0.0180)	-0.0751*** (0.0181)	-0.0526*** (0.0131)
	Employment protection legislation (ILO)	-0.0390 (0.0278)					
	Procedural requirements for dismissals (ILO)		0.0370*** (0.0056)	0.0449*** (0.0045)	0.0427*** (0.0055)	0.0440*** (0.0042)	
	Severance payments (ILO)		0.0101 (0.0063)	0.0112** (0.0053)	0.0090 (0.0057)	0.0105* (0.0054)	
	Flexibility of hiring and firing regulations (Fraser)						0.0010 (0.0007)
Collective bargaining system	Centralized collective bargaining (Fraser)	-0.0006 (0.0043)	0.0012 (0.0045)		0.0007 (0.0047)		
	Square of Centralized collective bargaining	0.0001 (0.0004)	-0.0001 (0.0004)		-0.0001 (0.0004)		
	Flexibility of wage determination (WEF)			-0.0063 (0.0084)		-0.0111 (0.0082)	-0.0162** (0.0080)
	Square of flexibility of wage determination			0.0004 (0.0009)		0.0009 (0.0009)	0.0014* (0.0008)
Business/Product market regulation	Administrative requirements (Fraser)	-0.0023** (0.0011)	-0.0023** (0.0010)	-0.0021* (0.0011)			
	Regulatory Burden (Fraser)	-0.0010** (0.0004)	-0.0009** (0.0004)	-0.0009** (0.0004)			
	Goods market efficiency (WEF)				-0.0110*** (0.0032)	-0.0107*** (0.0033)	-0.0069*** (0.0025)
	Intensity of local competition (WEF)						0.0008 (0.0021)
Taxation	Tax burden (Heritage)	0.0001 (0.0002)	0.0001 (0.0002)	0.0001 (0.0002)	-0.0000 (0.0002)	-0.0000 (0.0002)	0.0001 (0.0001)
Financial markets	Financial market development (WEF)	-0.0036 (0.0024)				-0.0021 (0.0024)	
	Credit market regulations (Fraser)		-0.0018** (0.0008)	-0.0016* (0.0009)	-0.0015* (0.0009)		-0.0021*** (0.0007)
	Constant	0.0728** (0.0327)	0.0335 (0.0250)	0.0560* (0.0287)	0.0765*** (0.0277)	0.1054*** (0.0333)	0.1012*** (0.0267)
Observations		745	769	750	752	754	1,376
R-squared		0.5908	0.5990	0.6026	0.6016	0.6015	0.6592
Number of c_id		91	93	91	91	91	138

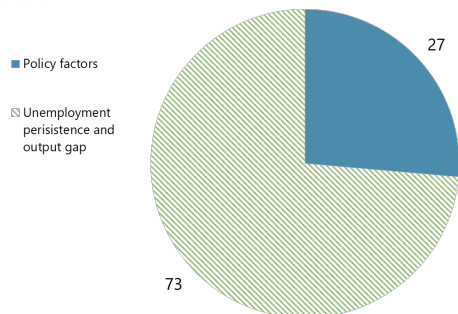
Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

1/ Sources of the data are in parentheses. All the indicators above, except the employment protection legislation indicators from the ILO, are given in an ascending scale in terms of efficiency/ flexibility: The higher the indicator is, the more flexible/efficient the market is.

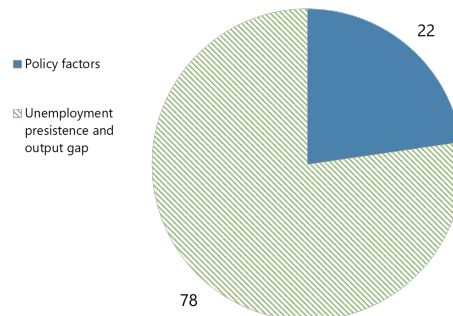
Figures 2.1 to 2.5: Share of institutional factors in the unemployment increase between 2009 and 2017 Using regressions 4 (LHS figures) and 6 (RHS figures)

Tunisia: Share of policy changes in the unemployment increase between 2009 and 2017
In percent



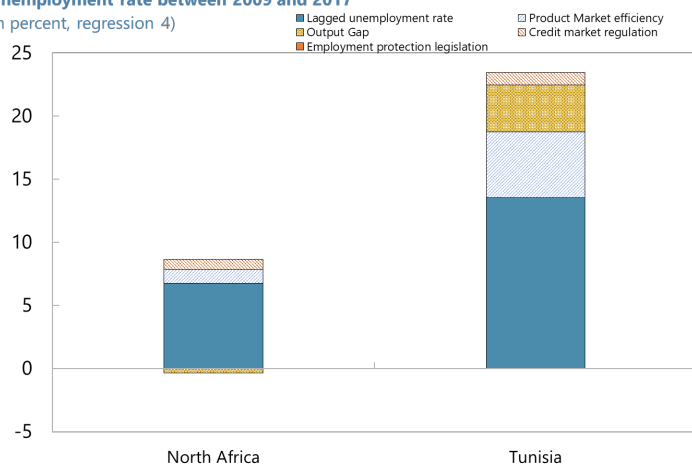
Authors calculations from regression 4.

Tunisia: Share of policy changes in the unemployment increase between 2009 and 2017
In percent



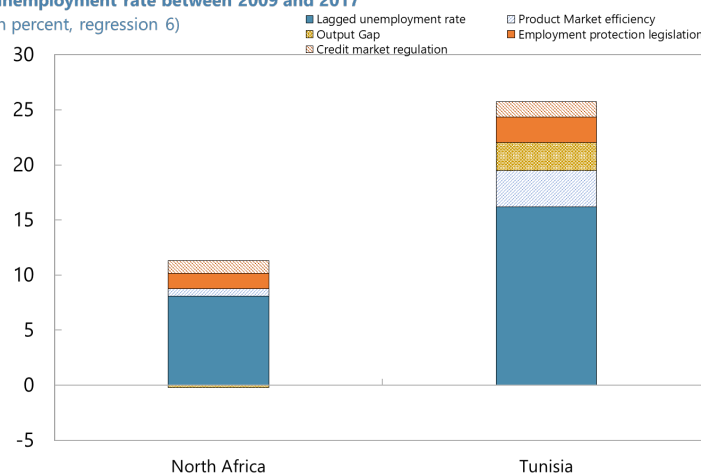
Authors calculations from regression 6.

Contribution of the output gap and institutional factors to the change in the predicted unemployment rate between 2009 and 2017
(in percent, regression 4)



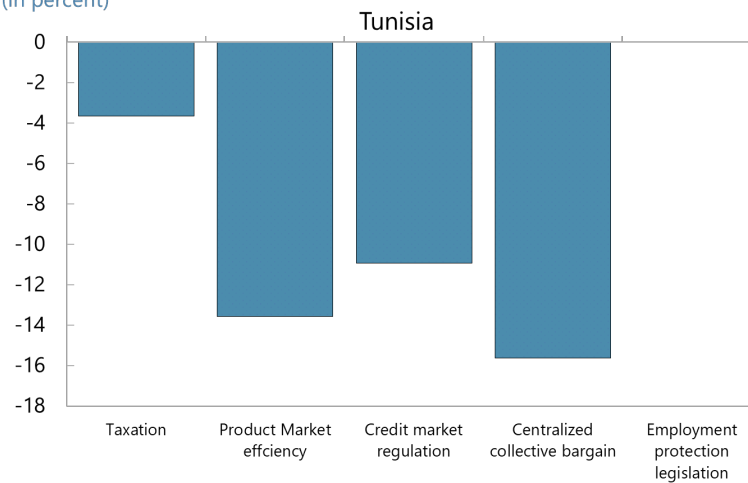
Source: Authors calculation based on regression (4)

Contribution of the output gap and institutional factors to the change in the predicted unemployment rate between 2009 and 2017
(in percent, regression 6)



Source: Authors calculation based on regression (6)

Change of institutional factors in Tunisia between 2009-2017
(In percent)



Sources: Fraser institute, ILO

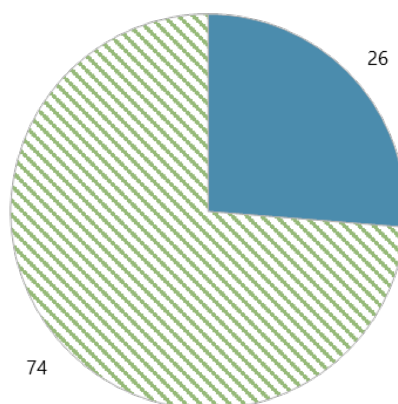
Figures 2.6 to 2.8: Share of institutional factors in the unemployment increase between 2009 and 2017

Using regressions 4 for males, females, and youths

Tunisia: Share of policy changes in male unemployment increase between 2009 and 2017

In percent

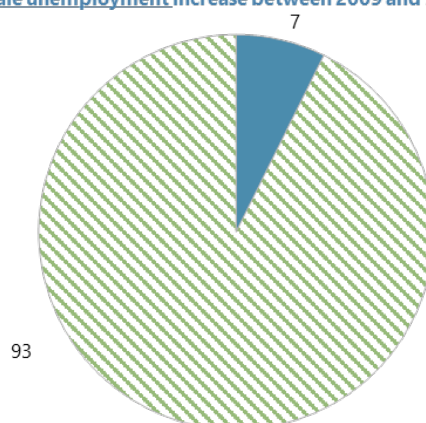
- Policy factors
- ▨ Unemployment persistence and output gap



Tunisia: Share of policy changes in female unemployment increase between 2009 and 2017

In percent

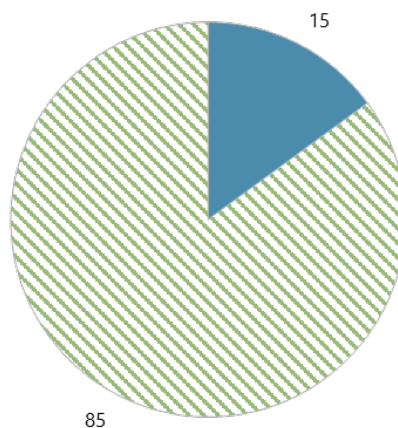
- Policy factors
- ▨ Unemployment persistence and output gap



Tunisia: Share of policy changes in youth unemployment increase between 2009 and 2017

In percent

- Policy factors
- ▨ Unemployment persistence and output gap

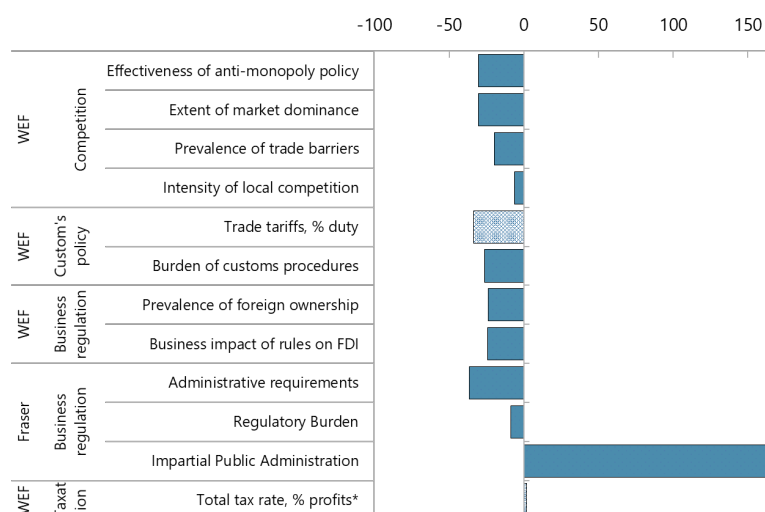


Source: Authors calculations from regression 4.

Among all institutional factors, the deterioration of product market regulation is likely to be the most relevant factor. During

the 2009-2017 period, and despite the adoption of important laws to strengthen the business climate (e.g., the revision of the competition law¹² in 2015 and a new investment law¹³ in 2016), improved transparency and a decrease in trade tariffs, several product market and business regulations' indicators in Tunisia (based on surveys¹⁴) experienced a deterioration between 2009-2017. The most important deterioration is in competition and administrative requirements, as the market power of monopolies and oligopolies has actually been reinforced during the last decade. Moreover, administrative requirements seem to be an important obstacle for investment and business creation in Tunisia. The new investment and competition laws may not have been effective yet in improving the business climate and competition, perhaps as the publication of those laws may not have been sufficient and should be accompanied by the effective implementation of new procedures (decrees and other explanatory documents) and the elimination of inconsistent laws.

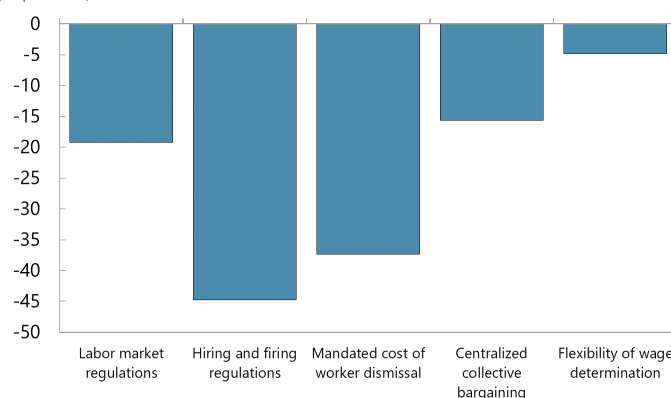
Figure 3: Change in the Product Market Efficiency and business regulation in Tunisia between 2009-2017 (In percent)



Sources: WEF and authors calculation. Solid Bars are the results of surveys, a decrease implies a deterioration of the indicator.

Part of the increase in unemployment during the last decade is attributable to labor market regulation, in the presence of an intermediate bargaining system and rigid product market regulation. Estimates from specification (4) show that an alleviation of dismissal procedures by one score point¹⁵ leads to a decrease in the unemployment rate by 4 ½ percent. It should be noted that the score for this index is low in Tunisia (0.25, from a score between 0 and 1), reflecting mainly the low protection of temporary in comparison with permanent workers. Overall, the sub indicators of labor market policies between 2009 and 2017 show a move toward a more rigid labor market and a more centralized bargaining system, while still

Figure 4: Change in Labor Market regulation and its subcomponents between 2009 and 2017 (In percent)



Source: Fraser Institute and authors calculations

¹² Law n° 2015-36

¹³ Law n° 2016-71

¹⁴ Except taxation and the number of procedures

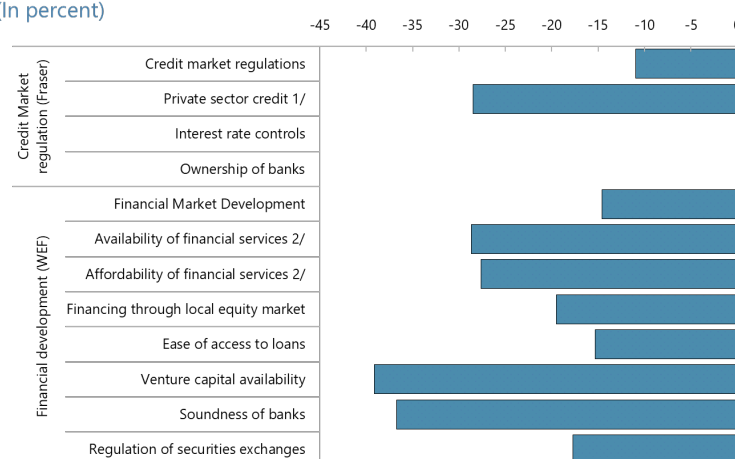
¹⁵ The ILO index used in specification 4 (EPLX) ranges from 0 to 1 and one score point is equal to 0.25

remaining at an intermediate level of bargaining (i.e., neither fully centralized, nor fully liberalized). The difference between de facto indicators (Fraser Institute's indicators – based on surveys, in figure 5) and de jure indicators (the ILO labor indicators-based) suggests that, even though Tunisian labor market laws have barely changed during the last decade, employers perceive that a more centralized bargaining system, coupled with a deterioration of the business climate, has made labor market regulations more rigid and as a consequence, assess labor market policies as deteriorating. As product market deregulation also incentivizes labor market deregulation – with an overall positive effect on aggregate employment (Blanchard and Giavazzi, 2003), it is quite likely that the deterioration in product market regulations has not helped to improve labor market conditions, and thus led to an increase in the unemployment level.

Access to credit matters for the labor market in Tunisia, especially in the presence of a rigid labor market regulation.

Estimation in table 1 shows that credit access explains about 5 percent of the unemployment increase during the period 2009 and 2017. Perceptions of banking sector conditions have deteriorated during the last decade. This has been associated with a few developments: a continuous crowding out from the public sector, shocks affecting durably bank soundness (e.g., through the weakened tourism sector and the increase in NPLs), lack of progress in credit access which impedes job creation through new innovating firms' (Acemoglu, 2001). In addition to the role played by financial inclusion in job creation, the Tunisian labor market presents some imperfections, coupled with a strong wage bargaining system. Financial development would help firms to better internalize those imperfections and allow for lower labor adjustment costs.

Figure 5: Change in Credit Market Regulation and its subcomponents in Tunisia between 2009 and 2017
(In percent)



Sources: Fraser Institute, WEF and Authors calculation

1/ The extent of government borrowing relative to private-sector borrowing 2/ between 2011 and 2017

IV. UNEMPLOYMENT IN TUNISIA AND ITS SENSITIVITY TO THE OUTPUT GAP

The Tunisian economy has been growing at a pace below its potential during the period, and therefore short of creating enough jobs to absorb new entrants. The output gap contributed positively – to the tune of a cumulative 11 percent - to the increase in the unemployment rate in Tunisia between 2009 and 2017 (charts 2.3 and 2.4). The persistence of the output gap is a result of the different domestic and external shocks that Tunisia faced, as well as the falling investment and productivity that in turn led to a decline in growth (OECD, 2018). Another possible explanation for Tunisia's persistent growth below potential could come from institutional factors that could, not only directly affect the unemployment level, as explained in the previous section, but also affect the speed of adjustment of employment to business cycles in Tunisia¹⁶. Institutional factors could impede adjustments to shocks by reducing the turn-over in the labor market. They can also slow down the recovery in the labor market during economic upturns, thereby preventing output from reaching its target level (David et al. 2019).

One way to empirically address this question is to estimate the sensitivity of unemployment to economic activity (Okun's coefficient), and then determine to what extent the latter could be affected by institutional factors. As in David et. al (2019), this section uses a broad panel of countries to explore the cross-country variation in Okun's coefficients and draws on the results to focus on the Tunisian case. The literature (Ball et al 2017, David et al, 2019, Ahn et al. 2017) points out that the sensitivity of unemployment to business conditions depends on the level of income. In light of this, we consider various estimations using a panel of 151 countries, including Tunisia. More specifically, we use a dynamic common-correlated effects model with heterogeneous coefficients in a panel over 21 time periods (from 1996 to 2017). This methodology allows us to deal with possible cross-sectional dependency through the inclusion of common factors in the estimation. Moreover, it is shown to perform well even in the case of dynamic models with weakly exogenous regressors and with the inclusion of non-stationary variables (Kapetanios et al. 2011, Chudik and Pesaran, 2013). Kapetanios et al. (2011) show that the estimators are also robust to structural breaks¹⁷.

The regression format is as follows:

$$\Delta u_{i,t} = \lambda_i \Delta u_{i,t-1} + \beta_i \Delta y_{i,t} + \vartheta_{i,t} \quad (2)$$

$$\vartheta_{i,t} = \alpha_i + \sum_{l=1}^{P_T} \delta_{i,l} f_{l,t} + \varepsilon_{i,t}$$

¹⁶ One different question is of course also whether and what extent Tunisia's potential growth has declined during that period. For more details, IMF, 2016.

Where $\Delta u_{i,t} = u_{i,t} - u_{i,t-1}$ is the (absolute) change in unemployment rate, $\Delta y_{i,t} = y_{i,t} - y_{i,t-1}$ is the change in log of output (real GDP)¹⁸, α_i a unit-specific fixed-effect; $\varepsilon_{i,t}$ is a cross section unit specific error term, which is assumed to be independent and identically distributed and $f_{m,t}$ are unobserved common factors, with (δ_i) is the heterogenous, country-specific loading factor. β_i represents the Okun's coefficient and is country specific. Following Pesaran (2006) and Chudik and Pesaran (2013), we include two lags of the exogenous variables as well as the cross-sectional averages and estimated the model in two steps. This in turn allows us to account for unobserved dependance between cross sectional units, which leads to unbiased ordinary least squares regression results.

Estimation results of equation (2) are presented in table 2, using annual data for a (unbalanced) panel over the period 1996 to 2017. Specification (1) includes all the 151 countries in our sample and specification (2) includes Tunisia, among middle income countries. This is to test whether unemployment changes exhibit a different reaction to output variations in middle income countries. The results are robust to strong cross sectional dependance (Pesaran, 2015). A potential challenge for the specifications below is that output change could affect unemployment change and thus, lead to an endogeneity problem within the model. To tackle this issue, we also estimated separately an augmented version of the model, by adding instrumental variables (the first four lagged variables of the output change). Results show no significant difference between the two versions of the model¹⁹.

Unemployment's responsiveness to variations in output depends on country income levels. The estimation of Okun's coefficient for the full sample (specification 1) is about -0.09 and statistically significant at the 1 percent level²⁰. For the sample of advanced economies, the coefficient seems to be lower than the one estimated by David et al (2019) and Ball et al (2017), suggesting that the level of income explains only in part the level of unemployment responsiveness to output changes. To confirm this hypothesis, we also conduct the estimation for several panels of countries, by income level (specifications 2 and 3). Results from the different specifications (table 2) show substantial differences across groups especially between low – middle income countries and advanced countries. Advanced economies show overall a substantially higher responsiveness of unemployment to business conditions.

¹⁸ It is worth noting that the frequency of structural breaks would hamper the HP filtering procedure. One way to deal with this problem is to estimate it using a larger time series, as we do from 1996 to 2017.

¹⁹ Hereafter, we have chosen not to include instrumental variables in the model for two main reasons: first adding instrumental variables does not change the conclusions and second, this allows us to estimate the Okun's coefficient with effective variables and not their instruments.

²⁰ Only the first lag appears to be significant and the test of Pesaran (2015) rejects the cross sectional dependance.

Table 2: Estimation of Okun's coefficient (Equation 2)

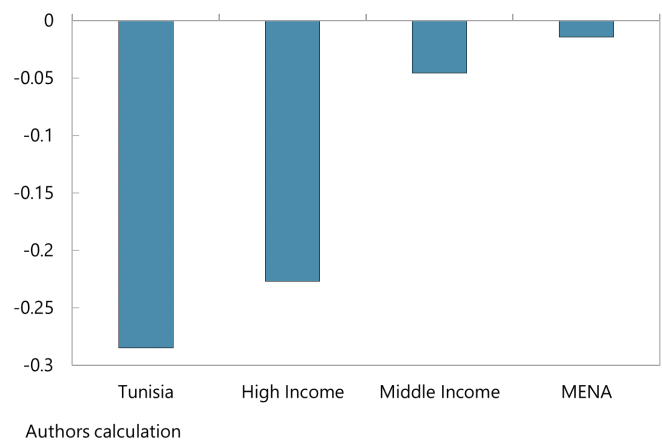
	(1) All sample	(2) Middle income countries	(3) high income countries
	$\Delta Unemployment$	$\Delta Unemployment$	$\Delta Unemployment$
ΔGDP_t	-0.094*** (0.016)	-0.073*** (0.014)	-0.244*** (0.035)
ΔGDP_{t-1}	-0.026*** (0.011)	-0.02 (0.015)	-0.057* (0.032)
$\Delta Unemployment_{t-1}$	0.118*** (0.034)	0.142*** (0.047)	0.175*** (0.071)
Constant	0.001 (0.001)	0.002 (0.002)	-0.001 (0.001)
Number of countries	151	41	48

For Tunisia, the responsiveness of unemployment to the business cycle is substantially higher than for the average of middle-income countries and the MENA region and is comparable to high income countries (Figure 6). This result is in line with IMF (2022) and Ball et al. (2019), showing that Tunisia has a relatively high Okun's coefficient, and that unemployment variations in Tunisia appear to be much more driven by changes in the business cycle than in countries with peer countries.

To better assess the reasons behind such a high sensitivity to the business cycle in Tunisia, we conduct a cross sectional estimation of the determinants of the Okun's coefficient. We include in the regression explanatory variables that have been shown in the literature to have an impact on unemployment's responsiveness to the business cycle (David et al. 2019, Furceri et al. 2020, Ball et al. 2019). We consider the following variables:

- The unemployment rate: Furceri et al. (2020) shows that the response is more pronounced for countries with a high unemployment level. Institutional factors affecting unemployment could also explain this positive relationship: a high degree of product and/or labor market flexibility allows firms to easily adjust employment when output changes, raising the Okun's coefficient (Ball et al, 2017).

Figure 6: Okun's coefficient
(in units)



- Labor market and business regulations: employment and product protection legislation are important institutional factors affecting the labor market as well as its responsiveness to business conditions (Jaumotte, 2011, David et al. 2019). In previous sections we show that flexibility in both areas can play a significant role in employment conditions, while the relationship tends to be neither positive, nor linear (see detailed discussion in section 2). Data on labor and business regulation are taken from the Fraser Institute and World Economic Forum (WEF). The advantage of this data is that (i) index's components are standardized from different sources, and this allows to calculate subcomponents by taking two or three ones, in order to capture the interaction between them, and (ii) subcomponents are available and calculated which allows for a more granular and precise estimation.
- The level of informality: the informal sector can have a stabilizing effect during the business cycle, especially at the time of recessions and downturns, as it may absorb workers who lose their formal jobs (IMF, 2022). Informality could then be at play as a buffer and reduce the sensitivity of employment to business cycles (Ball et al. 2019). Consequently, it is expected that the higher the level of informality, the lower is the response of unemployment to cyclical variations. The Medina-Schneider index of informality is used as a proxy of the informal sector (more details of the index in Medina and Schneider, 2018).
- Global economic integration (degree of trade openness): the response of the unemployment rate to the business cycle can be a function of the countries' dependance on global economic conditions. The share of exports and imports to GDP from the World Bank is used for that purpose.

The size of the informal sector is negatively correlated with the trade openness and flexibility of business as well as labor market regulations (table 5). This is in line with the literature which documents that informality tends to decrease as product markets are less rigid and the business climate is improved. As this significant correlation could affect the responsiveness of unemployment to business conditions, we include, in addition to the specification with all the variables described above, other separate estimations of individual variables, as well as correlated ones. We estimate the following specification:

$$\hat{\beta}_i = \alpha_i + \phi'X_i + \xi_i \quad (3)$$

Where $\hat{\beta}_i$ is the Okun's coefficient estimated by equation (2)²¹, X_i is the vector of control variables explained above. Results of the OLS estimation with robust standard deviations and using the cross-country data are presented in table 3²².

Unemployment is less responsive to cyclical conditions in countries with higher levels of informality²³ and/or lower levels of unemployment. This confirms that informality acts as a "buffer" to labor market disruptions in the formal economy (David et al. 2019; IMF, 2022). As the informal sector may absorb workers who lose their formal jobs during economic downturns, the adjustment to

²¹ Note that only countries with a negative or zero Okun's coefficient have been included in this regression

²² As the correlation matrix shows a high correlation between labor market regulation and business regulation indicators, a Variance Inflation Factor (VIF) test has been conducted and showed no collinearity between explanatory variables. Results are available upon request.

²³ As the Okun's coefficient is negative, a negative (positive) coefficient implies that the underlying factor amplifies (dampens) the responsiveness of unemployment to business conditions.

business cycles in economies with high informality is likely to occur more through wages and/or working hours in the informal sector, rather than through a reduction in the number of employed. Moreover, we observe that the higher the level of unemployment, the stronger (in absolute terms) the Okun's coefficient is.

Unemployment is more responsive to cyclical conditions in countries with more flexibility in their business regulations. While the individual specifications show no response of the Okun's coefficient to labor market regulation nor to trade openness, specification (7) from Table (3) that includes all explanatory variables show a significant effect of both. One plausible explanation is that the combination of the informal sector, business and labor market regulations have simultaneously an impact on the Okun's coefficient, while labor market regulation taken individually would not significantly affect the response of unemployment to business activity. This is in line with Fiori et al. (2007) and Cournede et al. (2016) who argue that labor and business regulations are mutually reinforcing.

To assess the impact of policy factors and test the hypothesis of their complementarity, we regress the Okun's coefficient on several subcomponents of business and labor market regulations. Results reported in table 4 confirm the interactions between the informal sector, the business and labor market regulations, and their combined effect on the Okun's coefficient:

- With respect to product market regulation, the regulatory burden and business barriers are the most significant drivers of the responsiveness of unemployment. The lower the regulatory burden and entry barriers, the higher (in negative terms) the Okun's coefficient.
- When it is significant, the coefficient associated with labor market regulation or its subcomponents is positive, implying that unemployment in countries with a higher share of informal sector, higher labor market flexibility and weaker business flexibility respond less to changes in the business cycle and vice versa.
- This confirms the adjustment role of the informal sector as well as the complementarity between business and labor regulations. This result is also relevant in Tunisia's context, as it highlights that a high level of product market flexibility, if not matched with labor flexibility could reinforce the bargaining power and worsening employment conditions (Jaumotte, 2011). As Tunisia is facing a high and persistent unemployment rate, Further flexibilization of the product market without taking into consideration labor market regulations, would lead to a higher sensitivity of unemployment to business cycles, already high in the Tunisian context. This in turn would increase vulnerability of the Tunisian labor market during downturns.
- Estimations suggest also that the collective bargaining system does not have a significant impact on the responsiveness of unemployment to business activity, but its interaction with other labor regulations -including the hiring and firing rules- affects the Okun's coefficient.

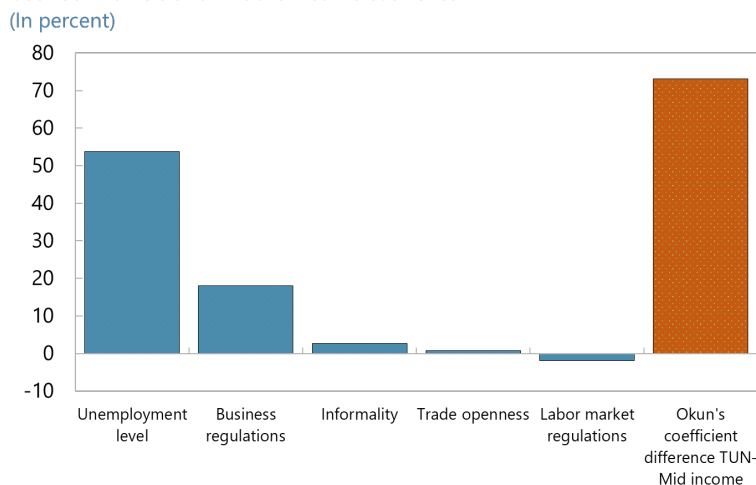
Tunisia's Okun's coefficient is 69 percent higher than the average of middle-income countries. Figure 7

compares the unemployment level as well as policies described above (informality, labor market and business regulations) with middle income countries. Regression results of equation (3) show that this significant difference between Tunisia and the average of the middle-income countries is mainly attributable to the unemployment level, which is 69 percent higher in Tunisia than the average of middle-income countries and explains about

48 percent of the difference in the Okun's coefficient between Tunisia and middle-income countries. 22 percent of the difference between Tunisia and middle-income countries is attributable to the higher flexibility in business regulation in Tunisia and 3 percent to the lower informality in Tunisia. Conversely, the slightly higher flexibility in the Tunisian labor market regulation and the higher share of trade openness in Tunisia have contributed to lower the difference between Tunisia and middle-income countries.

The results of this section highlight the complementarity between institutional factors and their impact of the labor dynamics. As Tunisia's Okun's coefficient is relatively high, it is worth noting that fixing structural impediments should go in tandem. This, in order not to increase further the sensitivity of the labor market to economic cycles. An improvement in the flexibility of business regulation alone, without further flexibility in the labor market and/or reduction in informality, would lead to a greater sensitivity of unemployment, which would weigh on the labor market, especially during economic shocks, which tend to be frequent in Tunisia.

Figure 7: Factors' contributions to the difference in Okun's coefficient between Tunisia and middle income countries



Sources: Authors calculation using regression (7)

Table 3: Institutional determinants of Okun's coefficient

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Informal size	0.005*** (0.0012)					0.003** (0.0015)	0.003** (0.0017)
Labor Market regulation (flexibility)		0.018 (0.0136)				0.0374** (0.0155)	0.033** (0.0168)
Business regulation (flexibility)			-0.043*** (0.0111)			-0.0392** (0.0171)	-0.031** (0.0181)
Unemployment rate				-0.012** (0.0065)			-0.012** (0.0059)
Trade openness					0.0003 (0.0005)		-0.0001** (0.0005)
Constant	-0.317*** (0.0474)	-0.292*** (0.097)	0.109* (0.0677)	-0.073* (0.0433)	-0.187*** (0.0326)	-0.244** (0.12)	-0.148 (0.11)
R-squared	0.1	0.17	0.07	0.08	0.002	0.16	0.23
Number of countries	101	100	100	101	97	100	96

Table 4: Institutional determinants of Okun's coefficient

Component	Subcomponent	(1)	(2)	(3)	(4)	(5)
Informal-size		0.0028* (0.0015)	0.003** (0.0016)	0.003* (0.0015)	0.006*** (0.0013)	0.001 (0.001)
Labor market regulation	Hiring and firing regulation (a)	0.041*** (0.0164)				
	Centralized collective bargaining (b)		0.02 (0.0156)			
	Combined: [(a)+(b)]/2			0.04** (0.0196)	0.021 (0.0188)	0.042** (0.0178)
Business regulation	Business regulation	-0.031** (0.0147)	-0.018 (-0.0135)	-0.034** (0.0158)		
	Administrative requirements				0.031 (0.0166)	
	Regulatory burden					-0.043*** (0.0087)
Constant		-0.245* (0.1287)	-0.279* (0.1513)	-0.272** (0.1295)	-0.597*** (0.141)	-0.225* (0.1217)
R-squared		0.17	0.12	0.16	0.16	0.24
Number of countries		97	97	97	97	97

Table 5: Correlation matrix

	Informal size	Labor market regulation	Business regulation	Unemployment rate	trade openness
Informal size	1				
Labor market regulation	-0.1423	1			
Business regulation	-0.6759*	0.4013*	1		
Unemployment rate	0.0841	-0.0654	-0.0046	1	
Trade openness	-0.0402	0.0820	0.1027	0.0072	1

V. CONCLUSION

Using panel data, we found that during the last decade the deterioration of institutional factors that affected labor market demand explains directly about a quarter of the unemployment rate increase in Tunisia. But also, it explains the sensitivity of unemployment to the output gap, with Tunisia's sensitivity to the output gap already on the high side.

Among all institutional factors, the deterioration of product market regulation is likely to be the most relevant factor, despite the adoption of important legislation to strengthen the business climate. This matters as the main challenge for high-education/high-skill workers seems to be the lack of "good" formal jobs, while for low-education/low-skill workers seems to be barriers to formality. And to a lesser extent, labor market regulation and financial conditions seem to also contribute to the increase in unemployment since the revolution. The intermediate wage bargaining system in Tunisia, coupled with a relative low flexibility level of labor market regulations does not seem to have had a direct impact on the increase of unemployment. However, it may have led to unemployment persistence, especially in a context of a rigid product market regulation.

Our results also show that policy and institutional factors affect the sensitivity of unemployment to the output gap. Interactions among those factors should also be considered when analyzing their impact on the output gap. For Tunisia, the sensitivity of unemployment to the output gap is substantially higher than the average of middle-income countries and is comparable to high income countries. We find that this excess sensitivity is mainly explained by Tunisia's high unemployment level, but also by an even higher business flexibility and lower informality than other middle-income countries.

In terms of policy implications for Tunisia, our results suggest that an improved business environment, increased labor market flexibility as well as reduced financial constraints would help reduce unemployment. Nevertheless, due to the complementarity of business and labor market regulations, their improvement should go in tandem, in order not to increase further the sensitivity of the labor market to economic cycles. An improvement in business regulation flexibility alone, without further labor market flexibility, would lead to a greater sensitivity of unemployment, which would weigh on the labor market, especially during economic shocks. This is critical as Tunisia tends to be particularly vulnerable to external shocks and the labor market is characterized by factors leading to hysteresis and persistence of unemployment.

This work is a first step in incorporating institutional factors more thoroughly when assessing developments in the Tunisian labor market. Future work could explore to what extent those factors constitute an issue and could be addressed when dealing with unemployment persistence in Tunisia.

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VII. ANNEXES

Annex 1: Employment protection legislation in Tunisia

The legislation governing the Tunisian labor market is a combination of the labor code, several specific laws and sectoral agreements:

- Specific laws for government employees and specific benefits attached
- Specific statutes for SOE employees
- Legislation for the private sector and norms within (56 collective agreements "conventions collectives", 54 sectorial agreements and 2 global/framework agreements "convention cadre").

The Tunisian labor code itself regulates the minimum wage ("SMIG" and "SMAG" for agriculture sector), social security, as well as hiring and dismissal rules. It has not been revised since 1996, when two amendments were passed, and more flexibility was added allowing for:

- More room for fixed term contracts and less reliance on permanent employment contracts,
- Specified procedures in case of layoffs for economic reasons,
- Rules setting a maximum severance payment in case of firing.

There is an important gap in Tunisia between the open end and fixed term contracts in terms of protection legislation (Figure 8), further evidenced by international comparison (Figure 8.1). Liberalizing fixed term contracts while maintaining stricter regulation on permanent contracts, coupled with cumbersome procedures (figure 8.3 on redundancy rules) creates a substitution effect from the latter to the former and makes more difficult the movement from fixed term to permanent, which transforms it into a trap rather than a springboard to more stable employment (OECD, 2013; Blanchard and Landier, 2002).

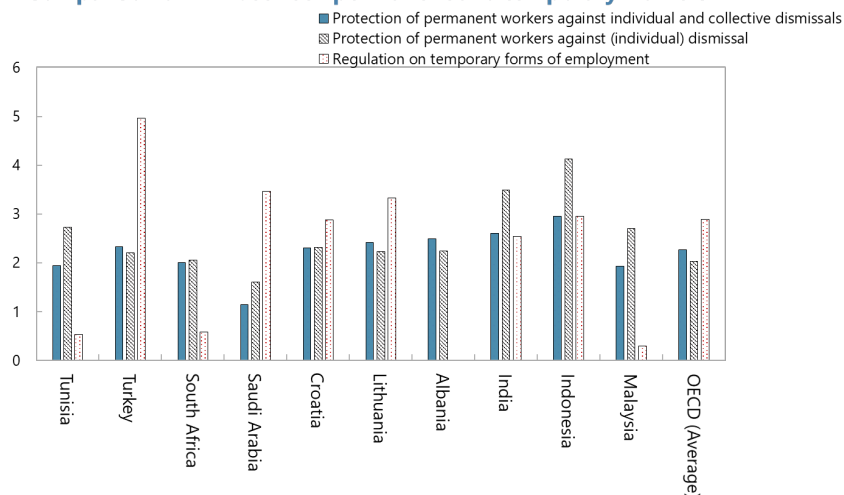
Table 6: A comparison of EPL between open ended and fixed term contracts in Tunisia

	Open end employment contract	Fixed term employment contract
Salaries and bonuses	The labor code specifies that both employees with fixed term and open-end contracts should be treated equally if the two types of contracts coexist in the enterprise for the same qualification and job. Also, the salary when available in collective agreements is applicable to open end, as well as fixed term contracts.	
Notice period	1 month or more if specified in the collective agreement	1 month or more if specified in the contract

Dismissal rules		<p>Dismissal is possible in 3 cases:</p> <ul style="list-style-type: none"> • Agreement between the employer and the employee • Serious misconduct (cases enumerated in the labor code) <p>In case of collective dismissals for economic reasons, the procedure is strictly regulated and cumbersome. Furthermore, the employer should consider those criteria: length of service, family duties. The decision should be submitted for acceptance to the mixed committee (commission paritaire).</p>	<ul style="list-style-type: none"> • The dismissal is possible after the notice period determined by contract 	
Severance payment	Abusive dismissal	1 to 2 months per year, max of 3 years	Theoretically the same case than for individual dismissal (1 to 2 months per year, max of 3 years), but the employer has the right to fire after the notice period	
	Individual dismissal	Not allowed, except serious misconduct or force majeure. The noncompliance with the procedure is considered as an abusive dismissal.		
	Economic reasons	12 days per year, with max of 3 months. The amount is always greater in collective agreements: up to 30 days per year with a max of 6-month salary		

Figures 8.1 to 8.3: Distribution of Protection of permanent and temporary workers in 72 countries

Comparison of EPL between permanent and temporary workers



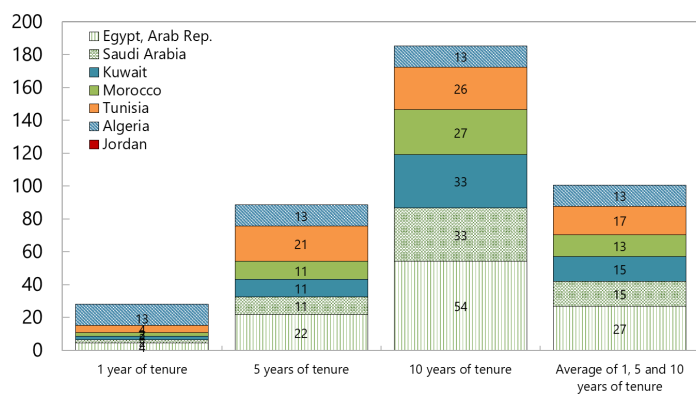
Source: OECD

Scale from 0 (least restrictions) to 6 (most restrictions), last year available

Source: OECD

Severance pay for redundancy dismissal

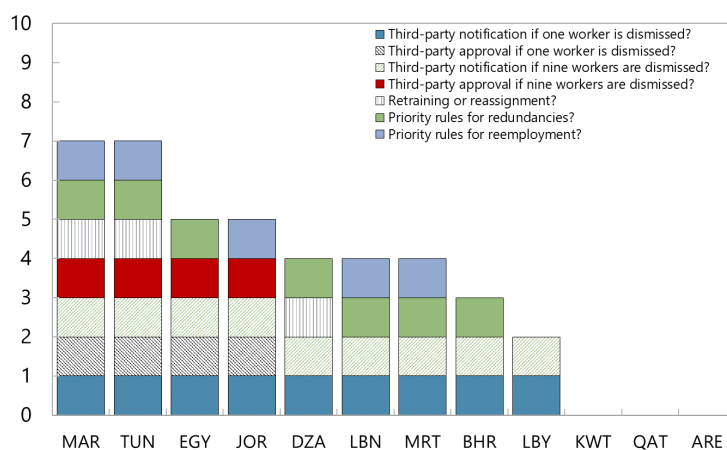
(In number of weeks)



Sources: WB employment data

Redundancy rules: A regional comparison

(Is the rule applicable in the country or not?)



Sources: WB employment data

Annex 2: Tunisia's wage bargaining system

•**Stylized facts:** Collective agreements apply to 57 percent of the total number of employees (ILOSTAT, 2014). They provide more protection to workers especially for termination payouts and cast a wage grid²⁴. Starting salaries in collective agreements, are on average 25 percent higher than the minimum wage (OECD, 2015), the latter applied only to those belonging to a sector without a collective agreement (15 percent of the labor force, MDICI estimates, 2015).

•**Negotiation rounds:** They are between UGTT, UTICA and labor inspection. The discussion is basically about the wage grid revision, with a great heterogeneity between collective agreements. The latter also specify the number of working hours per week (which is 40 hours or 48 hours in the general regime). Furthermore, collective agreements are more protective against layoff than the labor code.

•**Wage revision:** There are no specific rules concerning wage revision and indexation. Table 2 below depicts a positive and important correlation between the average salary increase and one year ahead inflation and a weak positive correlation between productivity and the average salary increase in the period between 2012 and 2018. Also, there is an important positive correlation between the SMIG and the average salary increase, suggesting that current inflation has been driving SMIG increases and has pushed the average wage up.

Table 7: Correlation matrix (2012-2018)

	Average wage growth	SMIG 48h growth
SMIG 48h growth	71.7%	
Labor Productivity growth	30.7%	18.7%
CPI growth	-15.2%	4.8%
CPI (N-1) growth	64.2%	15.4%

Source: INS, ITCEQ, ILO and authors calculation

•**Promotion and Advancement:** Every sectoral agreement specifies the salary grid and distinguishes between promotion and advancement in the career of each employee ("avancement d'échelon"). The particularity of the Tunisian system is that it is mainly based on seniority rather than productivity and performance. The advancement is automatic after a specific period in the same grade, generally between 1 and 3 years, and the promotion is generally based on three criteria, two of them are time based²⁵. The bargaining system does not allow for sufficient flexibility to ensure that the

²⁴ Not all aspects, in some circumstances, collective agreements follow the labor code (examples are given in WB, 2015)

²⁵ Almost all sectoral agreements specify that promotion is based on:

- The duration of the conduct in the profession
- Training and professional skills
- Seniority and scoring in the company

increase in wages is followed by an increase in productivity. This would allow to achieve higher employment level and also more internationally competitive companies.

Collective agreements at the regional level: there is no regional distinction in the wage grid, and the latter does not offer the possibility to businesses to use salaries as a leverage to improve competitiveness. Given that costs of business in interior regions are higher than the coastal regions, and productivity is also lower, and if wages are the same across the country, investors might err in favor of the coastal regions (also for logistical reasons).

Annex 3:

Competition in Tunisia and the labor market

In the Tunisian context, product market regulation to the extent that it limits competition, also constitutes an entry barrier and impedes the development of the private sector and job creation:

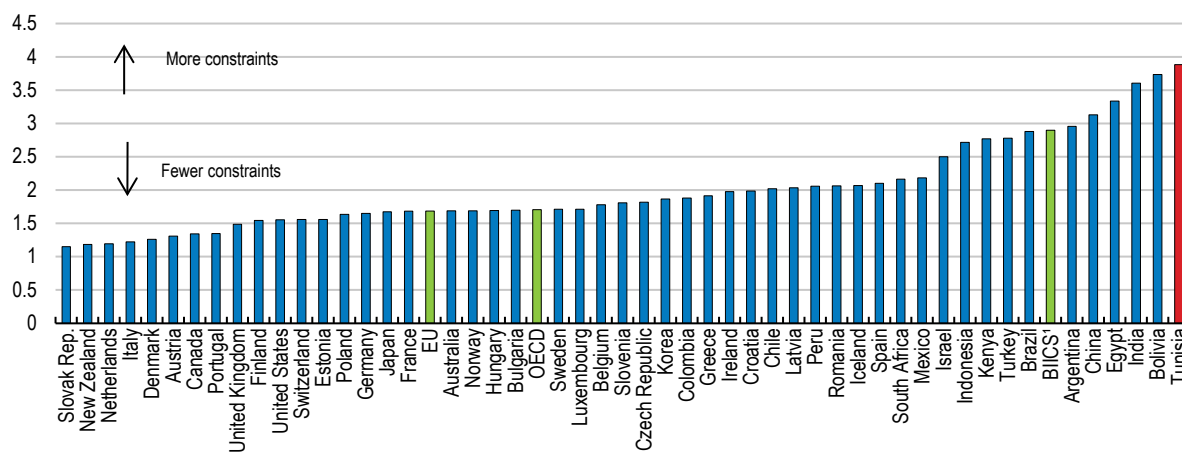
- First, several competitive sectors, such as trade, freight, passengers' carriage suffer from the high intervention of the state, not only via the important presence of SOEs, but also via strict regulation²⁶ and cumbersome administrative procedures -an entry barrier (Figures 9.1 and 9.2).
- Second, several products remain subject to price controls, either by the state (such as finite products from cereals, rice, tea), or by de jure cartels in some sectors, known as interprofessional groups ("*groupements interprofessionnels*"), which fix both prices and volumes between different operators within the sector. Both price control practices (i) maintain artificially the price for suppliers lower than the one which would prevail in a competitive environment, (ii) do not provide an incentive for inefficient suppliers already present to improve the production process and thereby improve the quality and cost of supply and (iii) in a market characterized by a non-perfect competition, and in the presence of administered prices, incentivizes firms to produce shortages and reduce quantity offer despite the presence of unused capacities (Simon, 1984).
- Third, even though Tunisia was one of the first countries in the region to adopt a competition law in 1991, the latter is somewhat outdated, suffering from several loopholes, inconsistencies and line ministry's important intervention in the competition process, which limits the competition council's role and autonomy, and instore an anti-competitive climate (OECD, 2021).
- In terms of labor market outrun, and in the presence of labor legislation which sets wages at the level of collective agreements and gives a significant weight to seniority (grade advancement) and less to productivity, all of those institutional deficiencies could discourage new entries of efficient suppliers and reduces the total market surplus that can be distributed to producers and consumers (OECD, 2019).

²⁶ Examples of the strict regulation: cumbersome requirements "*cahier de charge*" in the retail, health and transportation, with a minimum of vehicles, minimum of tonnage... The need of an authorization to launch a private company of passengers' carriage and prices are fixed, restrictions about the importation or exportation of some products and the list is not frequently updated. The wholesale markets, which are state owned, are a monopoly for some products such as vegetables and fruits. For further details, please refer to OECD (2019) and OECD (2021)

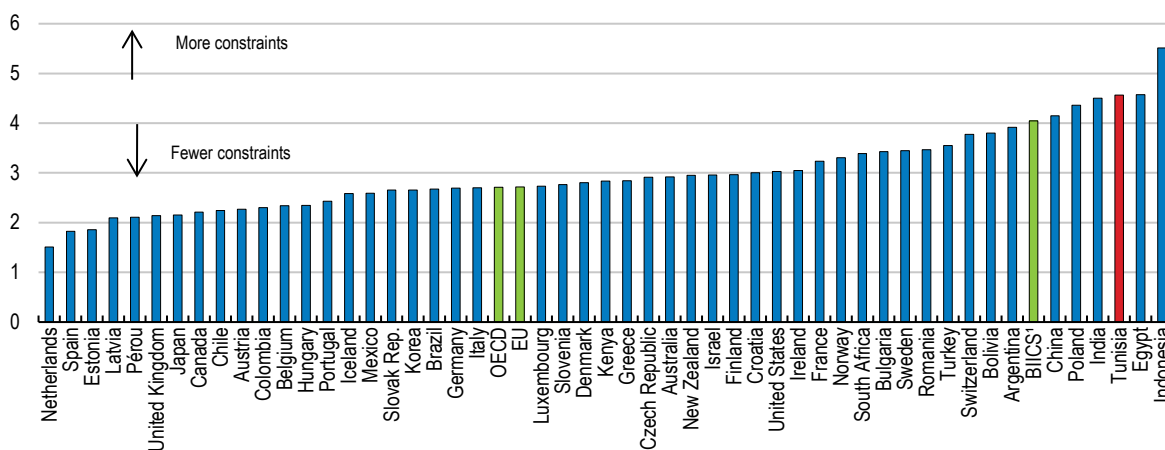
Figures 9.1 and 9.2: Regulatory obstacles to business in Tunisia

Source: OECD Product Market Regulation database.

A. Regulatory obstacles to entrepreneurship are particularly high



C. State control over business activity: public share ownership



Annex 4: Lessons from the COVID-19 crisis

The Tunisian economy has been strongly hit by the covid-19 crisis, despite a proactive reaction of authorities to contain the initial impact of the health and economic shock. The crisis highlighted yet again the fragility of the Tunisian labor market.

1. During the second quarter of 2020, the unemployment rate reached its highest level since the revolution, and the increase was higher than some peers, highlighting the elevated sensitivity of Tunisian unemployment to business cycles. The unemployment rate jumped by 3 percentage points between Q1 and Q2, 2020, reaching 18 percent with 161,000 job losses during the same period. Compared to Egypt (1.9 percentage points increase) and Morocco (1.8 percentage points increase), Tunisia had the highest increase of unemployment during the second quarter, a result in line with the high Okun's coefficient for Tunisia, as discussed in the section 4. While the magnitude of the labor force participation for both male and female has remained the same during the last decade, the impact of the Covid-19 fallout is more pronounced on graduates, particularly on female, with an increase of 3.8 percentage points, compared to the jump in unemployment of male graduates for 2.5 percentage points (Figure 10.1).

2. On a sectoral level, construction, manufacturing industries especially exporting ones were contributing the most to job losses (figure 10.2). Except for manufacturing sector, sectors experiencing the highest job losses are those depicting the most significant share of informality, with more than 45 percent of employees working informally. Employment dynamics during the covid crisis demonstrated further that countries with a high level of unemployment, a less flexible labor market and a more flexibility in business regulations are more likely to respond strongly to variations in the business cycle. Nevertheless, the covid crisis contradicts the buffer hypothesis of informal employment discussed in previous sections, as it shows that sectors with high level of informality were the most

Figures 10.1 and 10.2: The impact of Covid-19 crisis on the employment market

Figure 10.1

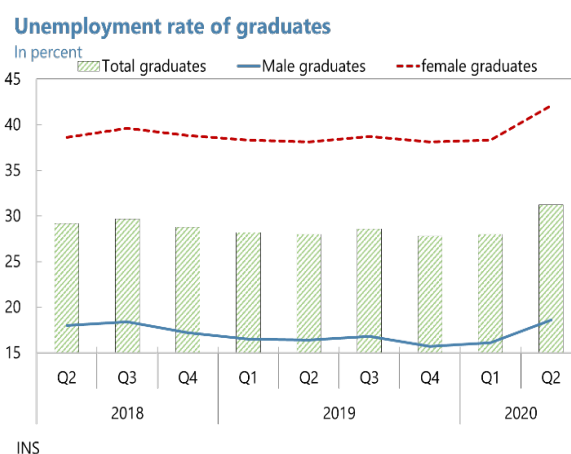
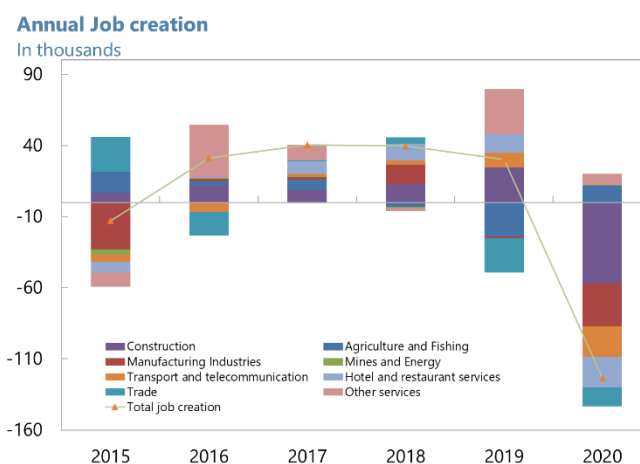


Figure 10.2



affected by job losses during the crisis, mainly because of several movement restrictions and lock downs, especially during the first and second waves.

Contrary to other recent crises in Tunisia in which most of informal workers have not been affected or little, except some specific sectors (mainly tourism), the COVID crisis has shown that relying on the informal sector as a way of absorbing the persistent unemployment is a fragile and temporary equilibrium, as the government turned to compensate during the COVID crisis both categories in the informal sector: informal self-employed with access to some capital and labor resources, mostly under the flat rate regime ("*régime forfaitaire*") and unprotected workers looking involuntarily to a subsistence wage. It then shed light on the importance of improving regulation in the formal sector and thus promoting a more inclusive growth.

Annex 5:
List of institutional variables used within the paper

	Indicator	Source	Description (as per of data source)
Labor market	Employment protection legislation	ILO	A composite indicator of Employment protection legislation governing regular contracts, individual dismissals
	Procedural requirements for dismissals	ILO	an indicator measuring the degree of employment protection based on legal provisions for procedural requirements (0: Simply oral notification, 1: Authorization of a third party)
	Severance payments	ILO	All statutory termination payments that arise from terminating a worker on worker-related grounds, such as worker conduct or worker capacity.
	Flexibility of hiring and firing regulations	Fraser	This sub-component is based on the Global Competitiveness Report question: "The hiring and firing of workers is impeded by regulations (= 1) or flexibly determined by employers (= 7)". The question's wording has varied over the years
	Centralized collective bargaining	Fraser	This sub-component is based on the Global Competitiveness Report question: "Wages in your country are set by a centralized bargaining process (= 1) or up to each individual company (= 7)". The wording of the question has varied over the years.
	Flexibility of wage determination	WEF	This sub-component is based on the question: In your country, how are wages generally set? [1 = by a centralized bargaining process; 7 = by each individual company] 2016–17 weighted average
Product market	Administrative requirements	Fraser	This sub-component is based on the Global Competitiveness Report question: "Complying with administrative requirements (permits, regulations, reporting) issued by the government in your country is (1 = burdensome, 7 = not burdensome)". The question's wording has varied slightly over the years.
	Regulatory burden	Fraser	This includes regulatory compliance and bureaucratic inefficiency and/or opacity
	Goods market efficiency	WEF	The extent to which the goods market is efficient
	Intensity of local competition	WEF	This sub-component is based on the question: In your country, how intense is competition in the local markets? [1 = not intense at all; 7 = extremely intense] 2016–17 weighted average
	Effectiveness of anti-monopoly policy	WEF	This sub-component is based on the question: In your country, how effective are anti-monopoly policies at ensuring fair competition? [1 = not effective at all; 7 = extremely effective] 2016–17 weighted average
	Extent of market dominance	WEF	This sub-component is based on the question: In your country, how do you characterize corporate activity? [1 = dominated by a few business groups; 7 = spread among many firms] 2016–17 weighted average
	Prevalence of trade barriers	WEF	This sub-component is based on the question: In your country, to what extent do non-tariff barriers (e.g., health and product

			standards, technical and labeling requirements, etc.) limit the ability of imported goods to compete in the domestic market? [1 = strongly limit; 7 = do not limit at all] 2016–17 weighted average
	Burden of customs procedures	WEF	This sub-component is based on the question: In your country, how efficient are customs procedures (related to the entry and exit of merchandise)? [1 = extremely inefficient; 7 = extremely efficient] 2016–17 weighted average
	Prevalence of foreign ownership	WEF	This sub-component is based on the question: In your country, how prevalent is foreign ownership of companies? [1 = extremely rare; 7 = extremely prevalent] 2016–17 weighted average
	Business impact of rules on FDI	WEF	This sub-component is based on the question: In your country, how restrictive are rules and regulations on foreign direct investment (FDI)? [1 = extremely restrictive; 7 = not restrictive at all] 2016–17 weighted average
	Impartial public administration	Fraser	This component is from the Global Competitiveness Report question: “The legal framework in your country for private businesses to settle disputes and challenge the legality of government actions and/or regulations is inefficient and subject to manipulation (= 1) or is efficient and follows a clear, neutral process (= 7)”. The question’s wording has varied slightly over the years.
Taxation	Tax burden	Heritage	Tax Burden is a measure of the tax burden imposed by government. It includes direct taxes, in terms of the top marginal tax rates on individual and corporate incomes, and overall taxes, including all forms of direct and indirect taxation at all levels of government, as a percentage of GDP.
	Trade tariffs	WEF	Trade-weighted average tariff rate. An applied tariff is a customs duty that is levied on imports of merchandise goods. This indicator is calculated as a weighted average of all the applied tariff rates, including preferential rates that a country applies to the rest of the world. The weights are the trade patterns of the importing country’s reference group.
	Total tax rate	WEF	This variable is a combination of profit tax (% of profits), labor tax and contribution (% of profits), and other taxes (% of profits)
Financial conditions	Financial market development	WEF	This sub-component is based on the question: In your country, to what extent does the financial sector is developed? [1 = not at all; 7 = to a great extent]
	Credit market regulations	Fraser	This sub-component measures the extent of which the credit market regulation is burdensome.
	Private sector credit	Fraser	This sub-component measures the extent of government borrowing relative to private sector borrowing. Greater government borrowing indicates more central planning and results in lower ratings.
	Interest rate controls	Fraser	Data on credit-market controls and regulations were used to construct rating intervals. Countries with interest rates determined

			by the market, stable monetary policy, and reasonable real-deposit and lending-rate spreads received higher ratings.
	Ownership of banks	Fraser	Data on the percentage of bank deposits held in privately owned banks were used to construct rating intervals. Countries with larger shares of privately held deposits received higher ratings
	Availability of financial services	WEF	This sub-component is based on the question: In your country, to what extent does the financial sector provide the products and services that meet the needs of businesses? [1 = not at all; 7 = to a great extent]
	Affordability of financial services	WEF	This sub-component is based on the question: In your country, to what extent does the cost of financial services (e.g. insurance, loans, trade finance) impede business activity? [1 = to a great extent; 7 = not at all]
	Financing through local equity market	WEF	This sub-component is based on the question: In your country, to what extent can companies raise money by issuing shares and/or bonds on the capital market? [1 = not at all; 7 = to a great extent]
	Ease of access to loans	WEF	This sub-component is based on the question: In your country, how easy is it for businesses to obtain a bank loan? [1 = extremely difficult; 7 = extremely easy]
	Venture capital availability	WEF	This sub-component is based on the question: In your country, how easy is it for start-up entrepreneurs with innovative but risky projects to obtain equity funding? [1 = extremely difficult; 7 = extremely easy]
	Regulation of securities exchanges	WEF	This sub-component is based on the question: In your country, to what extent do regulators ensure the stability of the financial market? [1 = not at all; 7 = to a great extent]
	Informal size (Schneider index)	Medina and Schneider (2019)	An estimated measure of informal production, defined as the share of goods and services in national GDP hidden from official authorities for monetary, regulatory, and institutional reasons and using the MIMIC model