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Measuring Legislative Predictability

The Case of the Kingdom of Jordan and Implications for the MENA Region

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Abstract

Laws and regulations represent a central tool for governments to achieve policy objectives, and they also represent a fundamental condition for making desirable individual and business decisions. While laws and regulations regularly have to be adapted to changing circumstances, frequent and sudden modifications indicate legislative unpredictability and are expected to impose considerable costs on citizens and businesses. Legislative predictability is assumed to be the consequence of high-quality laws, and existing evidence shows that regulatory management systems indeed impact legislative predictability. This paper proposes and implements an innovative legislative big data analytics approach to measuring legislative predictability in the Kingdom of Jordan and selected global comparator countries. It also maps out the feasibility of such an approach for the wider Middle East and North Africa region. Legislative data gathered from official government sources point to the high frequency of modifications in Jordan compared to a wide range of countries where data are available Around 10 to 15 percent of the original laws have been modified within 24 months of enactment over the past 20 years. In addition to prevalent modifications of new laws, even older laws face a comparatively high risk of modification in Jordan. Additional data collection following the template outlined in this paper could deliver a comparative data set, enabling a better understanding of the drivers and trends of legislative predictability and hence better evidence-based policies.

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Measuring Legislative Predictability:

The Case of the Kingdom of Jordan and Implications for the MENA Region

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1. INTRODUCTION

Legislation is a central tool for governments and policy makers to implement their agendas and manage the behavior of individuals, firms, and the state. Be it laws or regulations, both can directly affect investment, spending, competitiveness, and growth (Voermans 2009). Yet, for positive effects to materialize, high-quality legislation is required (Mousmouti 2012, Maler 2001). High-quality legislation should support competition, ease legislative and regulatory burdens, provide fair market conditions, and increase citizen satisfaction (Mousmouti 2012, Voermans 2009). High-quality legislation guides the behavior of individuals and firms as intended by the policy maker by being clear, precise and unambiguous; it thereby achieves the intended policy goal while being financially prudent (Maler 2001, Xanthaki 2010, Mousmouti 2012). Efficient laws and regulations rely on the 'use of minimum costs for the achievement of optimum benefits of the legislative action' (Xanthaki 2010, p.115). One hallmark of high-quality laws and regulations is *legislative predictability*.

Legislative predictability refers to a predictable legislative environment that consists of laws and regulations with no to little modifications in the short-run and limited (repeated) modifications in the mid-term. High-quality legislation that is clear, precise and unambiguous, should result in few ex-post modifications shortly after their introduction and thus display higher legislative predictability. Low-quality legislation, in contrast, tends to be complex, imprecise, and ambiguous, increasing confusion among firms and individuals and requiring more short-term changes to correct for mistakes. Thus, legislative predictability will be lower when legislation is of lower quality.

Legislative predictability has come to the fore in the midst of frequent and lasting crises and an ever more complex socio-economic environment. Policy makers, thus, face pressures towards faster law-making, while maintaining high-quality laws and regulations. Legislation is increasingly perceived as a "commodity on a time-to-market clock" (Voermans et al 2015, p. 283). Yet, these trends towards increasing legislative speed can compromise legislative quality. In turn, lower-quality legislation can hinder effective and efficient policy implementation, create confusion among citizens and firms, and result in high degrees of uncertainty (Xanthaki 2010).

Despite legislative predictability's beneficial impacts and central policy importance, there is a notable lack of an objective, reliable, and replicable methodology for its measurement that could be consistently applied to a wide range of countries in a repeated fashion. Given recent advances in computational methods as well as the academic literature, it is possible to make advances filling this gap. By implication, the objective of this working paper is to adapt and test a novel measurement approach to legislative predictability in the Kingdom of Jordan and to investigate if the approach can be applied in the broader MENA region.

The paper is organized in the following way. Section 2 briefly reviews the causes and effects of legislative predictability based on the available literature. Section 3 introduces the underlying data and indicators needed for estimating and analyzing legislative predictability. Section 4 presents legislative predictability patterns across a range of countries worldwide compared to Jordan. Section 5 provides the main analysis, with detailed descriptive and explanatory findings on Jordanian laws and regulations. Section 6 provides a country mapping of the MENA region to see the extent to which legislative data is available in the region and, thus, if the analysis can be reproduced beyond Jordan. Section 7 concludes by proposing an ambitious yet feasible agenda for deploying the proposed indicators across the MENA region.

2. Background: Causes and Effects of Legislative Predictability

Legislative predictability, as a key dimension of high-quality legislation, impacts a range of actors, potentially improving social welfare or diminishing it. Legislative predictability caters to the needs of businesses and households as the predictability of policy survival is decisive to ensure investment confidence (Aizenman & Marion 1993, Ramey & Ramey 1995, Fatal & Mihov 2003, Maltzman & Shipan, 2008). Frequent changes in the institutional environment in which companies operate - that is, laws and regulations in particular – increase uncertainty and negatively affect investment choices (Henisz 2000). Firms are particularly sensitive to uncertainty that is exogenous to their company, among which laws and regulations are a crucial component (Miliken 1987). Governments need to provide credible commitment to ensure that firms operate in a predicable legislative and regulatory environment. Aizenman and Marion (1993) were among the first that found a negative relationship between the unpredictability or uncertainty of policy making and economic growth. They placed a particular emphasis on businesses, which, in the context of high unpredictability, will withhold investments. Further research has strengthened this claim since then (Fatas & Mihov 2013. Baker et al. 2016, Al-Thaqeb et al. 2019).

There is some evidence that uncertainty can be used strategically by companies to benefit from the 'first-mover' advantage (Aragon-Correa & Sharma 2003, Carrera et al. 2003, Doh & Pearce 2004). However, firms mostly take a wait-and-see approach and postpone investments if uncertainty is high to increase planning security and might exit markets with high uncertainty due to risk aversion (Gulen & Ion 2016, Marcus & Kaufman 1986, Yang et al. 2004, Hoffmann et al. 2009). Even if firms continue to invest, investment tends to be limited and mainly focused on reversible and short-term rather than long-term, irreversible investment (Chen et al. 2019, Rugman & Verbeke 1998, Doh & Pearce

2004). Unpredictability also has a negative effect on firm value, especially for smaller-scale companies with lower financial leverage and firms with high R&D spending and high marketization (Zhu et al. 2020). In a situation of high uncertainty, the borrowing costs for firms increase and company performance decreases (Iqbal et al. 2020, Colak et al. 2017, Kelly et al. 2016; Pastor & Veronesi 2012).

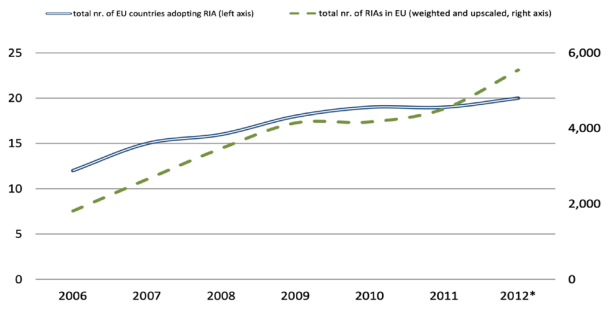
Legislative (un)predictability also affects households. One impact channel goes via lower company performance. A consequence of the negative effect of legislative uncertainty on companies is lower employment, which directly affects household income and spending. It is therefore not surprising that existing evidence indicates that households also delay investments and spending (Bernanke 1983, Bloom 2009, Pastor & Veronesi 2012). Reduced household spending, in turn, negatively affects production and thus economic growth (Bloom, Bond & Van Reenen 2007, Al Thaqeb et al. 2019). Ultimately, these recent studies confirm what Henisz (2000) already stated more than two decades ago: high unpredictability creates 'lower and less economically productive investment, and, therefore lower rates of economic growth" (p. 2).

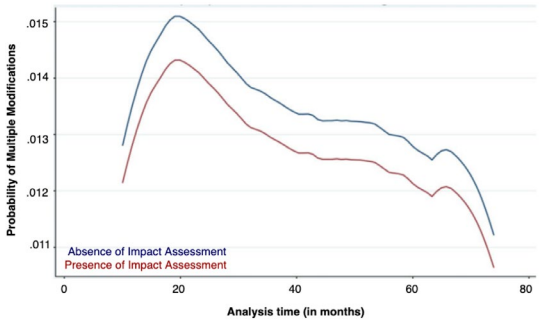
Improving legislative predictability depends on a wide range of social, economic, and political factors, most of which are hardly amenable to short to mid-term policy interventions. Nevertheless, regulatory management systems (or 'Better regulations' tools) have emerged as a policy tool to effectively improve legislative quality and support legislative predictability (Mousmouti 2012, Brenner & Fazekas 2023). By combining public consultations with ex-ante impact assessments and ex-post evaluations, these tools follow the principle of transparent, evidence-based policy making and should encourage governments to communicate legislative proposals, provide quantifiable evidence of their economic and societal benefits, conduct public consultations on legislative ideas and modify any policy draft according to feedback and evidence (Baldwin 2010, OECD 2019). Empirical evidence shows that the presence of various regulatory management tools is positively associated with economic growth and productivity, GDP per person employed, as well as a firm's market access and productivity (Torriti et al. 2022). Regulatory management tools such as ex-ante impact assessments are increasingly established in developing economies, and lessons are emerging on critically important factors associated with such tools' success (Ladegaard et al, 2018).

Europe is a good starting point to demonstrate that regulatory management tools are indeed correlated with legislative predictability. More broadly, regulatory management tools - from ex-ante impact assessment to ex-post scrutiny – should increase the overall quality of laws and regulations as they increase legislative predictability. Between 2006 and 2012, the number of countries adopting Impact Assessment systems in Europe doubled while the number of impact assessments increased threefold (Figure 1), even though the depth of these systems varies due to context-specific political and administrative factors (Lianos et al. 2016). Since good regulatory practices are assumed to be essential for improved legislative quality and, as a consequence, legislative predictability,

Figure 1. Total number of European countries with IAs and IAs produced (2006-12) (Source: Lianos, Fazekas, & Karliuk 2016)

Figure 2. Legislative predictability and IAs in France, Hungary, Italy, and the UK (206-12) (Source: Brenner & Fazekas 2023).





Brenner & Fazekas (2023) tested the link between impact assessments and modifications of laws in France, Italy, Hungary and the UK between 2006 and 2012. The evidence found supports the above expectations, namely that the presence of impact assessments has a positive effect on legislative predictability (Figure 2). More precisely, the analysis shows a statistically significant, negative effect of IAs on the probability of modifying laws, where frequent modifications are understood as the opposite of legislative stability. IAs reduced the risk of first modifications by 32%-42%, and the risk of multiple modifications by 38%-49% (Brenner & Fazekas 2023). Such empirical relationship between impact assessments and legislative predictability suggests that evidence-based policy-making can indeed assist law-making and encourage further developments of legislative predictability indicators.

3. Data, Indicators and Methods

The lack of indicators of sufficient precision and reliability, covering a wide set of countries and periods, thus far has imposed severe limitations on the quality of the evidence base for and effectiveness of policy reforms. Existing measurements, like the World Bank's Global Indicators of Regulatory Governance are a good starting point to understand the depth and scope of the regulatory management systems. These indicators are based on expert surveys, aggregated to the level of country-years.[1] They cover key themes such as the availability and depth of public consultations, impact assessments, access to laws and regulations, ex-post reviews, challenging regulations and the transparency of rulemaking together with an overall score value that allows for cross-country comparisons. At the same time, various pitfalls limit the application of such indices to legislative predictability. First, widely used indicators of regulatory quality, such as the Worldwide Governance Indicators' Regulatory Quality Index or the World Economic Forum's Burden of government regulation (Global Competitiveness Report), rely on expert opinions which can be imprecise, biased towards the views of large enterprises, and fail to track even large policy shifts. Second, expert opinion surveys lack the necessary detail for being policy relevant as they assess a country as a whole for a period (typically a year). However, countries are diverse within, for example regulatory quality may fundamentally differ by economic sector. Third, most regulatory quality indices are high level

[1] https://rulemaking.worldbank.org/en/methodology#:~:text=The%20Global%20Indicators%20of%20Regulatory,shaping%20regulations%20affecting%20business%20communities

composites combining processes, outputs and outcomes which make it hard to assess the effectiveness of government reforms. Fourth, many indicators which do not rely on expert judgement, instead track the existence of specific regulatory management tools and thus not adequate for assessing how each tool is used in practice and how they interact with their contexts such as changing economic circumstances.

While such measurement has been useful, it clearly has limitations in terms of accuracy and validity, calling for new metrics. The availability of large volumes of administrative data on laws and regulations open up new avenues for better gauging the determinants, extent, and effects of volatile laws and regulations. Such legislative predictability indicators should further contribute to a more encompassing understanding of legislative quality.

3.1 Legislative and Regulatory Data

More and more data has been made publicly available in recent years by political institutions through dedicated websites and open-data portals. Yet, the scope and quality of legislative data that are made available still display a strong cross-country variation in terms of temporal scope and depth. Nonetheless, most countries tend to disclose the title and text of legislation, its date of publication and the ID number of previous versions of legislation. The data collection work underpinning the present analysis follows the data collection methods, database structure, and quality standards established by the research team (Fazekas et al, 2024). The wider data collection effort and process is described in Appendix B. Here, we outline the specific data collection approach in Jordan.

The data collection process consists of four stages: source identification, source annotation, web scraping and parsing, as well as data evaluation. First, source identification was conducted in consultation with Jordan's Legislation and Opinion Bureau (LOB) which hosts the website and managed legislative data. Second, a detailed source annotation was created that precisely marks each variable in the dataset (table 1) on the LOB website. Such annotations are highly technical, offering guidance for the subsequent programming work. Third, the data collection process includes writing algorithms for scraping the LOB website and then parsing the scraped semi-structured data into standard data tables following our data standard.[2] Fourth, data quality, that is scope and accuracy, is evaluated both algorithmically and manually; and if errors are found then data collection and structuring are updated. Data scope is validated by comparing data record counts against record counts on the LOB website. Data accuracy is algorithmically checked by reviewing missing rates and looking at breaks in trends and distributions. Manual validation is done by comparing a small, random sample of dataset records against the original source data on the web.

3.2 Indicators

Both governmental bodies and academics are beginning to develop methodologies which can measure and compare regulatory predictability across countries based on novel data sources. These studies and

[2] See: https://docs.google.com/spreadsheets/d/1cCuGZnIyAWJHD0ktk239AHTuWZLp566I-ItYyJFjDCE/edit?gid=0#gid=0

reports represent the most relevant antecedents to the novel indicators proposed and tested in this report. First, the World Bank has created a measure of legislative predictability for Romania and Türkiye that focuses on the count of amendments and repeals over time (World Bank 2019, 2021). In the case of Romania, the World Bank relied on the number and frequency of amendments and repeals to show changes per year, trends over time, comparisons between different year intervals, as well as amendment patterns across different sectors. For Türkiye, the World Bank analyzed the number of annual changes and average changes over larger time periods with a further breakdown of these patterns by type of legislation. One of the key insights of these analyses was that they allow for an identification of the sectors where unpredictability was the highest. Second, Brenner & Fazekas (2023) uses legislative data on France, Hungary, Italy and the UK, to develop new indicators of legislative predictability focusing on the timing of first modification and number of total modifications.

While our main innovation is the development of legislative predictability indicators, we also propose a number of variables which are essential for exploring the prevalence, distribution and trends of legislative predictability (Table 1).

Table 1. Indicators used in the analysis (unit of analysis=individual law)

Name	Description
Modification count	Total count of modifications a law/regulation received until 2022
First modification date	Date when the law/regulation was first modified
Category	Type: law or regulation
Date passing	The date a law/regulation was published
Title	Title of a law/regulation
Text	Full text of a law/regulation
Text size	Size of the text (expressed in number of characters)
Policy Production	Number of laws/regulations passed in a year (level of country-year)
Related laws	Count of laws/regulations related to a given law or regulation
Initiator	Name of the initiator of legislation
Sector	Classification of legislation into non-economic, multisector, and individual NACE industries (including taxation and budget)

Modifications. To analyze modifications, we create two variables i) tracking the first modification, and ii) a series of modifications. In both cases, each law is analyzed over time. To this end, the data has to be organized in the following way: Each law is observed for a series of months beginning in the month it was published and ending at the moment of data collection. The first one is initially set to zero and stays zero until the law is first modified. At the time of transition, the law takes on a value of 1 and is dropped from the sample thereafter. The second formulation of the dependent variable equals 1 every month the law is changed, otherwise it is 0. Collecting the first date of modifications and the overall number of changes over time is a tested approach and previous work has applied a similar

methodology to a set of countries in Europe, namely France, Hungary, Italy, the United Kingdom (Brenner & Fazekas 2023).

The second unique feature of our proposed indicator set is that we track additional indicators of legislative and regulatory activities. Using these indicators as covariates allows us for a better understanding of these measures' contribution to enhanced legislative stability (and quality). We introduce each of the most relevant potential covariates below.

Category of law: Laws and regulations might have different modification patterns and the category of legislation should account for that. As a categorical variable, it takes the value of 0 for regulations and 1 for laws.[3] Incorporating the category allows us to understand which type of legislation is prone to legal uncertainty and thus require closer attention in the future.

Sector of law. Given that a standard classification of economic sectors is available across countries, such as NACE in the EU, it is possible to assign laws to economic sectors based on their texts and they matching to sector descriptions. This enables a closer look at those sectors that are particularly exposed to legal and regulatory instabilities and allows for targeted political counter-measures to protect businesses in these sectors. More details on this variable can be found in Section 3.3., below.

Initiator of law. Knowing the initiator of legislation not only allows us to observe which actors are generally more active in drafting laws and regulations but also check for the initiators that are linked to higher levels of regulatory predictability or lack of thereof.

3.3 Sectoral Classification

To analyze legislative predictability by economic sector, we have to assign laws and regulations to economic sectors. As our source legislative dataset does not contain such information, we classify laws into economic sectors in a separate analytic stage after the data collection process. The goal of matching laws and regulations to specific sectors is to identify if some are more exposed to unpredictable legislative environment compared to others.

In order to classify laws and regulations into economic sectors, we rely broadly on *Statistical Classification of Economic Activities in the European Union* (NACE) industry classifications. NACE is an industry standard classification system and mirrors the United Nations' *International Standard Industrial Classification of all Economic Activities (ISIC)*. Both NACE and ISIC follow the same logic. While these categories are widely used in the industry and by international organizations, they come with a few caveats from the perspective of legislative analytics. First, a few categories of laws and regulations are not present in the NACE classification, but they are of high relevance for defining the sample for analysis. For example, not all legislation is relevant for economic industries. Various laws and regulations tackle issues of personal life (e.g. marriage or citizenship). We labeled such legislation as

[3] We collected all primary laws (دستور) and regulations (نظام) on the LOB website while excluding constitutional laws (دستور), agreements (اتفاقية) and instructions/guidelines (تعليمات) due to their less economic and/or more administrative scope.

"Non-Economic". Additionally, a large set of legislation regulates the public sector – in particular public administrations and municipalities, as well as courts and judges. We combined these laws and regulations under "Public_Administration_and_Judiciary" and remove them for the sectoral analysis of legislative predictability. Second, legislation can tackle multiple sectors at the same time without any NACE category dominating. To account for such laws and regulations, we added the category "multisector". Third, taxation and budgetary legislation plays a significant role for businesses and households in a horizontal, cross-cutting manner, e.g. changing VAT rates impacts all sectors similarly from mining to IT. This was considered by creating a dedicated taxation and budget category. The resulting modified NACE classification will be called GCO sectoral categorization which allows us to select those laws which have economic relevance and apportion them into specific sectors where legislative activities are likely to differ. (Table 2). While this task is automatized for the broader GCO dataset, we additionally manually checked and corrected all Jordanian laws since 2000 and a subset of Jordanian regulations since 2000 for assuring the highest quality analysis in this paper.

Table 2. Sectoral Classification labels. NACE original labels and modified/additional labels (GCO categorization)

GCO	NACE
Agriculture, forestry and fishing	Agriculture, forestry and fishing
Mining and quarrying	Mining and quarrying
Manufacturing	Manufacturing
Energy	Electricity, gas steam and air conditioning supply
Water and waste	Water supply; sewerage; waste management and remediation activities
Construction	Construction
Wholesale and retail	Wholesale and retail trade repair of motor vehicles and motorcycles
Transportation	Transporting and storage
Tourism and hospitality	Accommodation and food service activities
Information and communication	Information and communication
Finance	Financial and insurance activities
Real estate	Real estate activities
Professional services	Professional scientific and technical activities
Business support activities	Administrative and support service activities
Public administration and judiciary	Administration of the State and the economic and social policy of the community
Defence and police	Provision of services to the community as a whole
International affairs and trade	Provision of services to the community as a whole
Social security	Compulsory social security activities
Education	Education
Health care	Human health and social work activities

Arts, entertainment, and recreation	Arts, entertainment and recreation
Voluntary and representative organizations	Other services activities
Household services	Activities of households as employers, undifferentiated goods and services, producing activities of households for own use
Extraterritorial organizations	Activities of extraterritorial organizations and bodies
Taxation and budget	Administration of the State and the economic and social policy of the community
Multisector laws	-
Non-economic laws	-

3.4 Methods for Exploring Legislative Predictability

Once all the relevant indicators are calculated, both for legislative predictability and contextual variables like sectors, we carry out a range of explorative and descriptive analyses. Combining variables on modifications with contextual variables allows us to measure regulatory predictability and its underlying drivers.

First, we explore legislative predictability across countries, comparing Jordan to a set of different countries. This offers crucial insights into cross-country variability and how different legislative systems operate. The analysis is based on the smoothed hazard risk of legislative modification. Such smooth hazard curves display how the risk of modification changes over time (i.e. months). Second, we deep dive into Jordanian legislative data, by looking at trends to track legislative predictability over two decades. This in-depth descriptive analysis disaggregates the data by year, sector, and initiator. The in-depth analysis starts with the distribution of laws and regulations passed in a given year which takes the absolute yearly count of laws and regulations. Next, the analysis moves to modifications by displaying modifications as percentage of all laws and regulations passed in a given year, followed by modifications as percentage of all laws and regulations passed within 24 months. We further disaggregate modification within 24 months by the providing the percentage share of economic sectors as well as the policy initiator for all laws and regulations that were modified within 24 months.

4. Legislative Predictability in an International Context

Uncertainty in policy making is a global issue and legislative predictability concern should not be seen in isolation. Figure 3 provides a set of global comparators with data drawn from six diverse countries, covering both low- and high-income countries, as well different political systems.[4] The purpose of this section is to situate the overall pattern of legislative predictability in the Kingdom of Jordan in a

[4] The figures are calculated based on the LEGDAT dataset (mid-2023 version). More information on the data and country scope can be found www.globalcorruptionpbservatory.com.

global perspective. This allows for some initial cross-country insights into the relevance of legislative predictability as a general measure of good governance and provides us the opportunity to discuss the pattern of legislative predictability in Jordan relative to other countries.

Figure 3. Monthly risk of first modification after legislation entered into force.

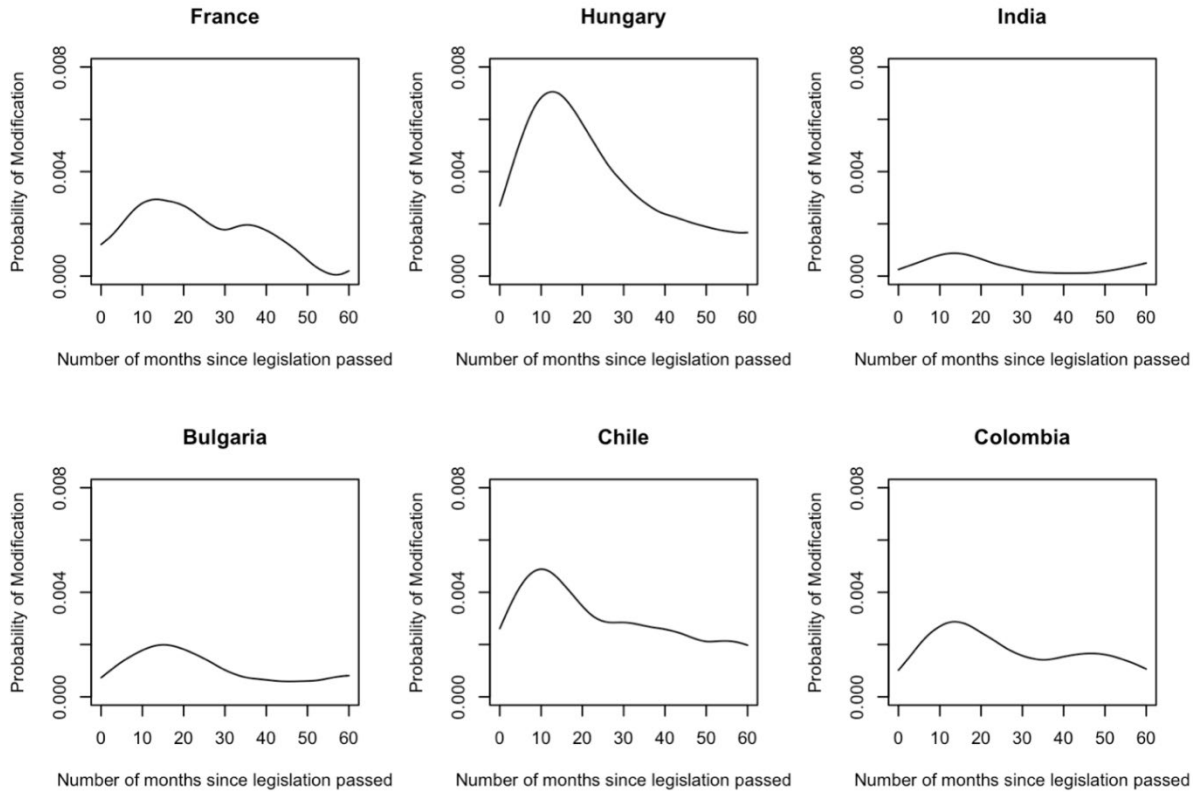
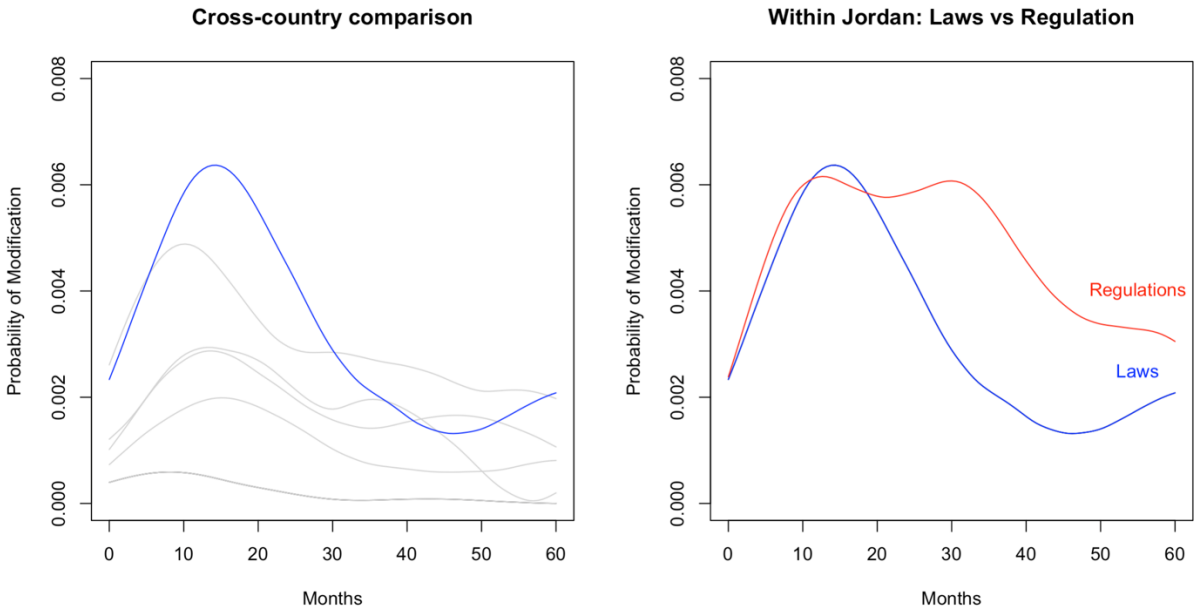


Figure 3 shows that, albeit cross-country variation is strong, the risk of first modification is highest within the first 24-30 months after legislation passed with a peak around 12 months. Afterwards, the risk of modifications is downward sloping indicating persistently lower risk of first modifications over time. Such consistent cross-country patter suggests that a typical law in these countries have a 2-stage life-cycle: i) the first 24 months represent a typically volatile period where many laws do not 'survive' without a modification; and ii) the subsequent months and years, beyond 24 months where a typical law becomes stable and 'survives' a long period without any modifications. Accepting this rough classification model, we can propose a straightforward, evidence-based legislative stability or predictability indicator: modification within the first 24 months of a law following enactment. This is going to be one of our main stability indicators going forward.

Before progressing to legislative stability indicators, let's situate the Kingdom of Jordan in the above cross-country pattern (Figure 4). The left panel in Figure 4 combines all country data from Figure 3 and highlights the risk of modification curve for laws in Jordan. The figure shows that Jordan both fits the general trend and differs in one important aspect. While the risk of modifications is elevated during the first 24-30 months and follows the pattern of other countries, the downward slope afterwards does not decline steadily. Instead, a new increase emerges after roughly 4 years which means that Jordan both faces short-term uncertainty for businesses and households - a troublesome trend

that is observable across various countries - but also a long-term trend of unpredictability which is unique in our sample. As we have seen in Figure 3, most countries face high legislative unpredictability in the first 24-30 months and consistently lower unpredictability later on. In other words, what makes Jordan stand out in a cross-country comparative context is that even in the long run, the legislative environment for businesses and households remains uncertain.

Figure 4. Risk of first modification by number of months passed, Kingdom of Jordan, 2000-2021



We further investigate modifications for laws and regulations separately (right pane, figure 4). We can observe that the risk of modification is even higher for regulations thank laws. In other words, both laws and regulations in Jordan face the highest risk of being modified for the first time in the 24 months after passing, i.e. within the first 2 years. Yet, while the risk of first modifications becomes relatively low after 24 months for laws, regulations continue to face a high risk of modifications up until month 40-45. This implies a constant and high risk of modifications beyond the medium run in Jordan.

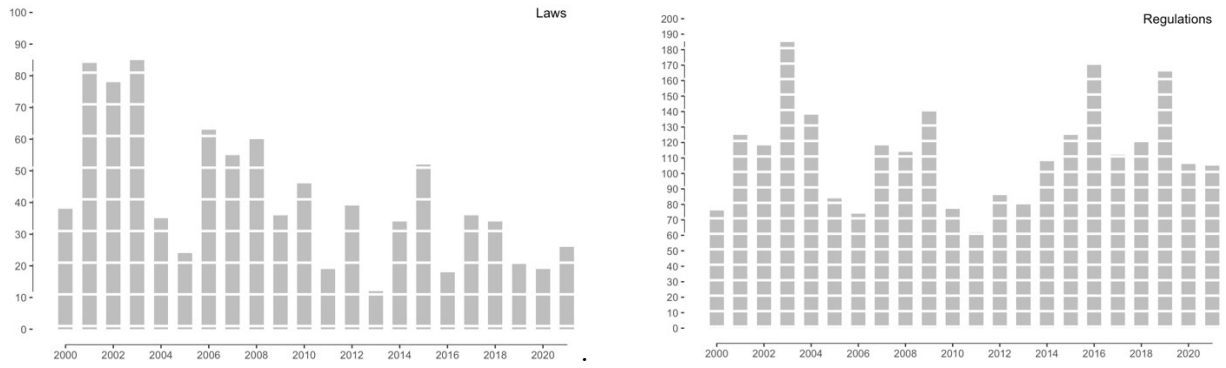
Overall, both the international cases, as well as the Jordanian example, point at significant short term legislative unpredictability within the first 24 months after production. Hence, the ratio of laws passed in a given year that were modified within the first 24 months will become the basis for measuring legislative predictability in Jordan in the following section.

5. LEGISLATIVE PREDICTABILITY IN THE KINGDOM OF JORDAN

5.1 Legislative Production Trends

Recent empirical evidence shows that excess legislative production can lead to low quality legislation and inefficient bureaucracy which, in turn, can have negative economic effects (Gratton et al. 2021). Legislative production, the overall number of laws and regulations passed in a year, can therefore be a first indicator of legislative quality and legislative unpredictability. Figure 5. shows the number of passed laws and regulations between 2000 and 2021. In terms of laws, we can observe a peak in the early 2000s and a downward slope ever since. The data indicates that Jordan is reducing its legislative production in terms of laws, while the pattern for regulations diverges. Rather than a downward slope, there is an almost constant and high level of yearly new regulations.

Figure 5. Legislative production in Jordan by type of legislation, 2000-2021



These pattern of legislative production invites various interpretations. First, the higher production rate for regulations rather than laws could indicate a preference of policy makers against more formal procedures associated with law making to escape closer scrutiny and lengthier processes. This might or might not affect the quality of legislation. Second, it could indicate that despite the decreasing number of laws, the overall body of legislation remains unstable and complex with a constantly high level of regulations needed to implement policies. Third, external events can create demand for additional legislative production. The peaks of legislative production around 2003, for example, occurred during a time in which Jordan accessed the WTO and signed a set of free trade agreements (El Anis 2018). The regulatory production peaks in 2016 and 2019 corresponds to a period in which Jordan faced, among other challenges, additional economic and political pressures linked to external financing and the election of a new government (IMF 2016, 2019).

Yet, in order to unpack these intriguing patterns, we have to look at whether laws and regulations were merely modifying the existing body of legislation or added new rules in terms of original laws and regulations. The former would indicate instability while the latter would imply regulating additional areas of the economy and society.

Figure 6 allows to explore the relationship of new versus modifying laws as well as regulations, and hence point at the most likely explanation of the above patterns. We can observe two interesting patterns of legislative production. First, the enactment peak for laws in the early 2000s was mainly driven by modifications that constitute between 60-70 percent of all laws passed. This seems to indicate a general pattern of 'updating' the legislative environment in Jordan. In 1999, King Abdullah II took the reins with a reform-oriented agenda that aimed to establish Jordan as a 'business-friendly environment' that should "attract foreign direct investment, kick-start domestic industrialization and improve the well-being of average Jordanians" (El Anis 2018: 220). The process started in 2000 with the country's accession to the WTO, followed by a set of bilateral and multilateral free-trade agreements (El Anis 2018).

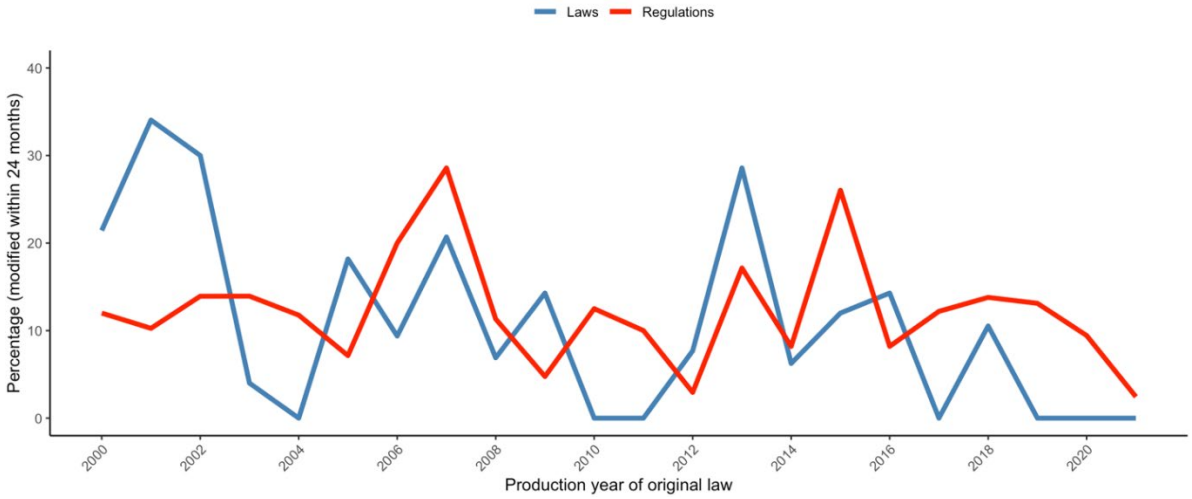
Figure 6. Modifications as percentage of all laws and regulations in a given year (2000-2021)

The second pattern that we can observe in the data shows a different story for the more recent years as the share of modifications increased again after 2012, peaking in 2019 at almost the same level as in 2003. Such increasing levels of modifications can thereby also indicate a more unpredictable legislative environment. Similarly, regulations experienced modification peaks in 2012, 2017, and 2019 which further poses potential challenges in terms of legislative predictability. To further investigate these patterns, the next section takes a closer look at short-term modifications within 12 months.

5.2 Legislative Predictability and Its Drivers

Overall, the Kingdom of Jordan shows a constantly high ratio of modifications over the years for both laws and regulations. Yet, laws and regulations need to change in order to keep up with changing societal circumstances. Hence, modifications are not per se an indication of low-quality legislation and an unpredictable legislative environment for businesses and households. Modifications become problematic from the perspective of predictability if they occur too quickly after passing the law or regulation. In such cases, the social environment is rather unlikely to have changed dramatically, instead some error in the original law or regulation is a more likely cause. years after production. Given the typical life-cycle of legislative modifications identified above, we focus on legislation that was modified within 24 months after being produced in the period between 2000-2021 (Figure 7).

Figure 7. Modification within 24 months; high-risk period of legislative unpredictability, 2000-2021

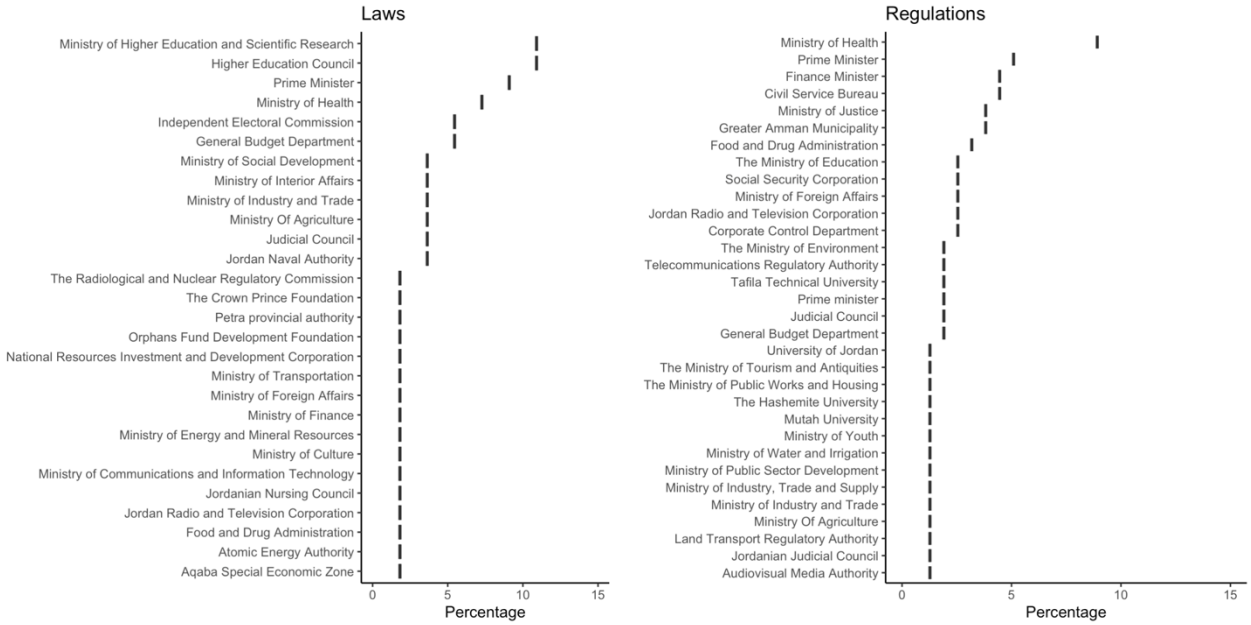


Jordan has several spikes of relatively high legislative unpredictability between 30-35 percent over time for both laws and regulations with regulations showing overall a slightly more constant risk around 10-15 percent throughout our observation period. For laws, the variation in modification risk is slightly larger with some notable years without any law being modified within 24 months. Nonetheless, we can observe a spike of legislative unpredictability roughly every 3-4 years, indicating – on average – a constantly high level of legislative unpredictability.

What are some of the drivers behind legislative predictability in the Kingdom of Jordan? The first possible driver is the initiators of legislation. Possibly, some initiators create legislation that is more prone to being modified in the short run than others. Figure 8 thus shows the percentage of legislation modified within 24 months by initiator. A crucial caveat here is the quality of data. The website of the Legislation and Opinion Bureau does not provide direct information on legislative initiators. We therefore collected all names of both public and private institutions mentioned in article 2 of any law and regulation. While this approach followed the recommendation of representatives in Jordan, the correctness of this cannot be guaranteed. Furthermore, even with this approach, the initiator name

for many laws and regulations remains unclear. This should be kept in mind for any conclusion based on the initiator data in figure 8.

Figure 8. Relative share of initiator's legislation modified within 24 months, Kingdom of Jordan, 2000-2021



For laws, around 11 percent of all laws linked to the Ministry of Higher Education and Scientific Research and the Higher Education Council were modified within 24 months after production, followed closely by the Prime minister (9%), the Ministry of Health (7%), as well as the Independent Electoral Commission and the General Budget Department (both at 5%). For regulations, we see lower levels of exposure across a wider set of initiators: notably, the Ministry of Health (9%), the Prime Minister (5%), the Finance Minister (4%), and the Civil Service Bureau (4%). One might argue that these results vary once public administration and non-economic laws are excluded. We therefore added a figure on the relative share of initiator's legislation modified within 24 for all laws except public administration and non-economic laws to Appendix A. For regulations, the first three initiators with the largest share of modified regulations remained identical, while for laws, we can observe a reduced share of modifications for laws initiated by the Prime Minister's office.

Next, we also analyzed the sectoral distribution of legislation as well as the sectors most exposed to laws and regulations modified within 24 months. Figure 9 starts by showing the overall distribution of sectors between 2000 and 2021 for all laws and regulations. As in most countries, laws and regulations linked to public administration and judiciary constitute the largest (or second largest) sectors. The content of these laws and regulations typically deals with the set-up and organization of ministries, local municipalities, and courts. As such, these laws and regulation are not directly linked to economic sectors. Similarly, non-economic legislation constitutes around 1-5 percent of all

legislation and tend to target the personal life of citizens (e.g. laws linked to marriage) or other non-economic issues. In the remainder of this section, both categories are removed and Figure 10 shows the link between sectors and predictability by excluding the categories of public administration and non-economic laws.

Figure 9. Distribution of legislation by sector, 2000-2021

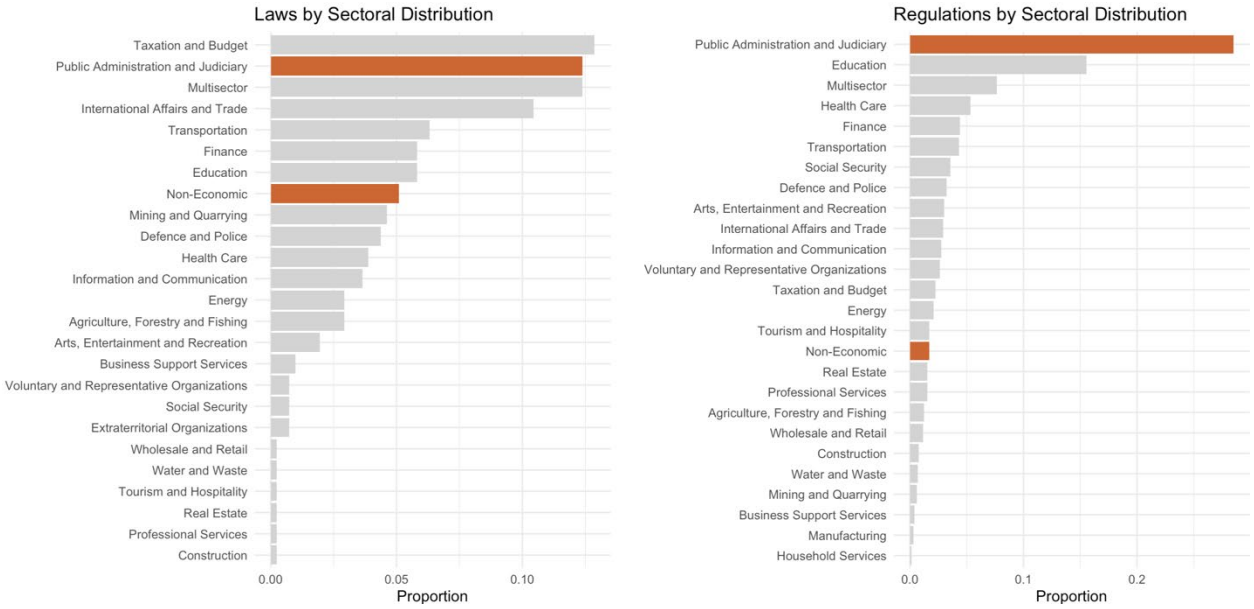


Figure 10. Share of modification in a sector relative to all modifications, 2000-2021

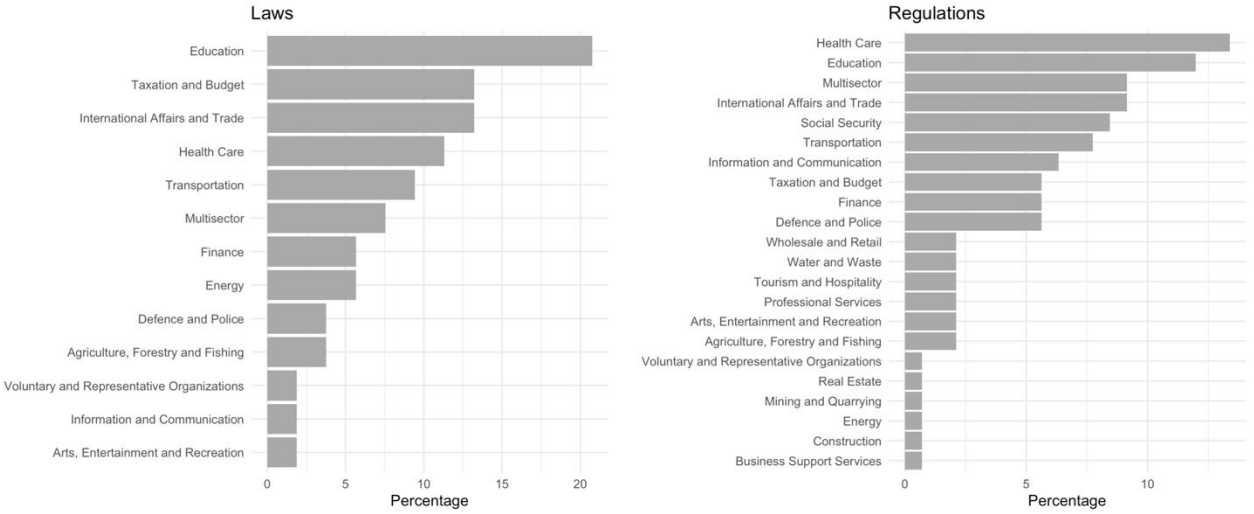


Figure 10. show which sectors are most affected by legislation that was modified within 24 months in the period between 2000 and 2021. For laws, more than 20 percent of all laws modified within 24 months were linked to education, followed by taxation and budget laws. For regulations, more than

15 percent of regulations modified within 24 months are linked to health care. Interestingly, it is not necessarily the sectors that dominate the production of legislation that show most legislative unpredictability, even though a very broad link between production and unpredictability seem to persist. Understanding the drivers behind this pattern will require further investigations.

6. Data Mapping in MENA

Given the demonstrated value of legislative predictability indicators in Jordan, a similar approach could be applied to further countries in the MENA region. To establish the feasibility of such extension, we conducted a detailed mapping of data availability in Algeria, Djibouti, the Arab Republic of Egypt, Iraq, Lebanon, Morocco, Qatar, Saudi Arabia, Tunisia, and the United Arab Emirates. The goal of this mapping is to show the potential of our legislative predictability analysis beyond the Kingdom of Jordan and the possibility of a detailed cross-country analysis in the MENA region. Following our tested approach in Jordan, we thereby focused on publicly available data from parliamentary, governmental, or ministerial websites. Table 3 provides an overview of the time span, the number of observations and the source link for each country. The presence of N/A does not indicate missing data but rather difficulties in determining the number of observations on the source website.

Table 3. Overview of legislative data sources reviewed

Country	Coverage	Observations	Source
Qatar	1961-2023	802	https://www.almeezan.qa/Default.aspx
Lebanon	1900-2023	3,788	http://www.legallaw.ul.edu.lb/LegisltaionSearch.aspx
Saudi Arabia	1930-2023	447	https://laws.boe.gov.sa/BoeLaws/Laws/
Tunisia	1957-2023	5,629	http://www.iort.gov.tn/
United Arab Emirates	1971-2023	223	https://elaws.moj.gov.ae/laws/search
Algeria	1964-2023	N/A	https://droit.mjustice.dz/ar/content/قوانين-أساسية-2
Egypt, Arab Rep.	1857-2023	9,813	https://www.cc.gov.eg/legislations
Iraq	2012-2023	N/A	https://moj.gov.iq/iraqmag/page_1/
Morocco	1964-2023	1,055	https://adala.justice.gov.ma/themes
Djibouti	N/A	N/A	https://preprod.ansie.dj/Ancienne.php

Table 4 shows the structural results of this mapping exercise We focused in particular on variables that were available in Jordan and thus would allow a direct comparison with our findings on legislative predictability for Jordan (a detailed mapping of websites is available in Appendix B).

All mapped countries allow us to collect data on category of legislation (law or regulation), the respective title and text, as well as the date of entering into force. This in itself allows an analysis of legislative production similar to the analysis of legislation production in Jordan from Section 4.1. Yet data availability for more in-depth legislative analytics widely varies by country. Let us review mapped countries in turn.

It is only for Iraq that this remains the only analysis possible with the data publicly available online. Legislative data in Iraq is only accessible through the Official Gazette, published by the Ministry of Justice, and contains legislation in a scanned pdf format from 2012 onwards. In the case of Djibouti, information on legislation is available via the Gazette Officielle de Djibouti that includes a search function by year, type of legislation, and policy area. Individual legislative pages are in a semi-structured html format and include the title, text and date of passing which allows us to scrape the texts and classify it into economic sectors. Furthermore, Djibouti also offers data on related legislation which enables a more detailed analysis of legislative complexity. Yet, a major caveat remains. Data availability seems to end in 2016 and neither Djibouti, nor Iraq would allow us to analyze legislative predictability.

The situation is slightly different for Egypt, Algeria, Lebanon, Morocco, and the United Arab Emirates. In all these countries we do have some indirect, and potentially imperfect, ways to collect information on legislative modifications and thus predictability. Egypt offers a slightly better analysis since the website displays legislative data by category or year of legislation. The individual page then offers the date of passing, the title and text in a standardized html format that can easily be collected. This allows both an analysis of legislative production as well as a classification of legislation into economic sectors. Potentially, even an analysis of legislative predictability is possible. While the website does not provide any direct information on modifications, information insides the title could be used to distinguish original legislation from modifications.

Table 4. Availability of selected legislative variables in mapped data sources, MENA region

Description	Qatar	UAE	KSA	Tunisia	Morocco	Lebanon	Algeria	Egypt	Djibouti	Iraq
Title										
Text of legislation										
Category: law vs. regulation										
Date of passing										
Date of first modification										
Total nr. of modifications										
Economic sector										
Initiator										
Related legislation										

Algeria offers a simple list of legislation with information on the title, as well as the count and first date of modification. The legislative texts are only available in pdf format. PDFs are often unstructured or scanned which makes a detailed analysis difficult to conduct. Especially differentiating the

economic sector of legislation is not possible. Yet the website contains a list of modifications with the date which is necessary to provide a more general analysis of legislative predictability.

In the case of Lebanon, the University of Lebanon's website hosts a comprehensive collection of laws and regulations that can be filtered by year, date, category, topic and administrative section. The individual page of legislation includes the law title, date of passing, law text as well as the date of first modification. Data is available in a standardized html form and thus relatively easy to collect. Morocco, similar to Lebanon, provides text in a structured html format with information on modifications within the text which would allow an imperfect analysis of legislative predictability.

Qatar, the United Arab Emirates, the Kingdom of Saudi Arabia and Tunisia provide the most suitable ways to collect our core variables. In the case of Tunisia, the main source is the country's official gazette. The website requires a preselection of the code of laws (e.g., labor code), which then opens a list of all related laws in a standardized format with a hyperlink to the respective individual law page. The individual page itself contains the category, law title, date of passing, and the law text. The website also provides a single count of total modifications and related legislation with a separate column that further differentiates the overall count of related legislation by degrees and judicial decisions.

For the United Arab Emirates, the Ministry of Justice website offers a legislation portal with all previous legislation, differentiated by categories and a separate table on the side of the websites listing related legislation. The individual legislative page contains the title, text, date of passing and the initiator. In terms of modification, previous changes based on the date are available. The initiator of legislation can only be determined inside the law text which requires a predefined list of possible initiators, similar to Jordan. While data is in a standardized html format, collecting the date and count of modifications requires links across different website pages.

Saudi Arabia offers a website with an extensive list of laws and regulations. The individual page contains the law title, date of introduction, date of passing, the law text, as well as the count and date of modifications. If modified, the part of the legislative text being modified will be highlighted in yellow with a pop-up window that specifies the original law text, as well as the modified text with the date of modification - year/month/day. The modification is thereby forward looking which allows us to simply count the number of modifications and pick the first modification as the date of first modifications.

Qatar shows one of the best data availability patterns. The Almeezan website provides a list of legislation based on the subject or date of legislation with a filter to distinguish between legislative categories (laws, regulations, etc.). The page for individual legislation then contains the title, date of passing, law text, and previous versions of the legislation based on the count and date of each modification. Information on the initiator is limited and contains, similar to Jordan, only the name of the ministry, organization or body. All data is available in a standardized html form.

Overall, the data mapping exercise in the MENA shows promising results for several of the countries and would benefit from an application of the legislative predictability in the future work.

7. CONCLUSION

The analysis introduced a range of indicators and background legislative variables (e.g., sector) both for the Kingdom of Jordan and selected global comparators. This analysis demonstrated the fruitfulness of bringing data analytics to the domain of legislative analysis, for better regulation and improved law making.

According to the presented empirical evidence, Jordan experienced an unpredictable legislative environment in the last two decades as highlighted by cross-country comparison. Based on a robust empirical strategy that relies on the full legislative corpus from the official government website, this working paper has focused on the modification of laws and regulations by conducting a range of explorative and descriptive analyses. To determine the drivers of unpredictability, we combined variables on the modifications of laws and regulations with contextual variables linked to sectors and initiators.

The results showed that Jordan experienced several periods of high legislative unpredictability over time with more between 30 percent of legislation being modified within 24 months after passing. We further showed that legislative unpredictability is most prevalent in the education sector for laws and the health care sector for regulations with a broader pattern indicating a possible link between production and unpredictability. This environment poses issues for the investment choices of businesses and households who tend to delay investments under high uncertainty and thus negatively affect the general growth trajectory.

Based on a detailed website mapping, it is established that legislative analytics can be extended to the broader MENA region which would allow for a more encompassing regional perspective on legislative unpredictability to detect common trends and drivers. Understanding legislative unpredictability within the national context and across the MENA region would then also benefit the tailoring of regulatory management systems, such as Regulatory Impact Assessment (RIA), to increase legislative predictability and thus certainty among businesses and households.

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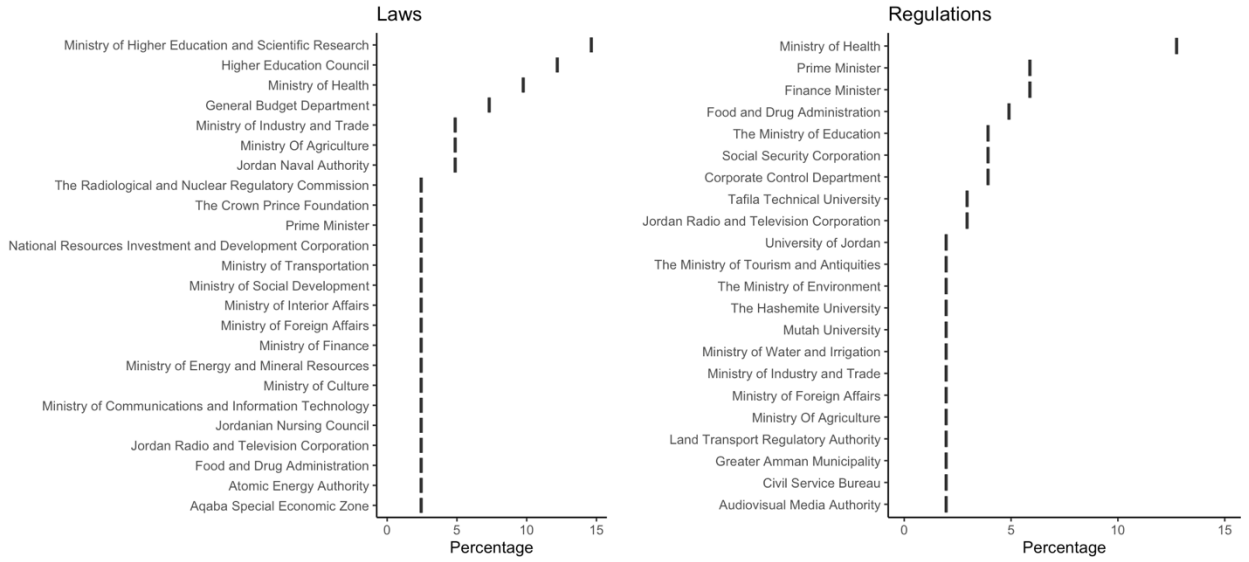
9. APPENDICES

Appendix A. Additional charts

Figure A0.1 Relative share of initiator's legislation modified within 24 months, 2000-2021, excluding public administration and non-economic legislation



Appendix B. Data Collection

The GCO data collection approach aims to collect structured and comprehensive legislative data on laws and regulations based on publicly available data that includes information on both the legislative structure (such as related legislation and the economic sectors effected by a law/regulation) as well as the legislative texts themselves. In order to maximize analytical precision and policy relevance, our data collection approach is comprehensive and includes all or close to all data available on the official government data source. The collected data follows a standard data structure that makes our approach comparative and scalable.

The data collection process for the regulatory predictability indices is divided into four stages: Source identification, source annotation, data collection and data evaluation. As a first step, relevant legislative data is mapped (or identified) and collected in a way that allows for a standardized procedure which can be reproduced over time. Ideally, such legislative information is collected from national parliamentary websites. Yet, depending on the national context, this might not be the case and information can be scattered across several websites (e.g. office of the prime minister, ministry of justice or even outsourced company websites). After the source information has been collected, the second stage of the data collection process is the annotation of the source. Source annotation requires that each of our variables responds to a particular location on the given website and our research team marks each location through a screenshot system which then allows the scraping of data from the

source (i.e. the respective website). After all the preparatory steps, the data collection starts, using robust web scraping and parsing algorithms which are replicable and scalable allowing for continuous data collection at a comparatively low cost (assuming source data format and structure remain the same). The last stage is the data evaluation. Even the best source annotation and data collection effort can result in data scraping or parsing errors. Evaluating the collected data is therefore critical for assuring quality data which is well structured and accurately mirrors the official government data. Once the first version of the collected data is ready, our research team verifies that the data structure corresponds to the GCO legislative data template (variable names and contents are permissible). Moreover, data content is checked on a sample to verify if information is correctly parsed from the web into our database and that there are no obvious errors such as variables are completely missing or stored in the wrong table. We check if the missing rates or rates of non-sensical values (e.g. zeros) for each variable are low. These checks typically reveal data quality and scope errors which then are fed back into improving the data collection and parsing algorithms. We cycle through data collection, checking and updates until data quality is sufficiently high.

Table B1. Overview of GCO legislative datasets

Country	Coverage (Years)	n (laws)	n (total)
Bulgaria	2006-2022	1,659	3,061
Chile	1900-2022	(2,504)	13,971
Colombia	1998-2022	1,598	10,657
France	2012-2022	473	1,700
Hungary	1998-2022	4,365	5,743
Jordan*	1900-2022	2,065	2,065
India	1952-2022	3,433	9,022
Portugal	1976-2022	4,810	12,974
Russian Federation	1995-2022	9,616	31,438
United Kingdom	2006-2022	534	3,116
United States	1995-2022	4,425	135,052
Total		**48,087**	**315,256**

*Notes: *The total number of observations for Jordan includes laws and regulations. For all other countries the total includes non-enacted (or ongoing) bills and enacted laws.*

Appendix C. MENA Data Mapping with extended variable list

This appendix provides the data mapping table with the full list of variables that were checked on national parliamentary and government websites across the MENA region.

Table C1.

Name	Description	Qatar	UAE	Algeria	Djibouti	Egypt, Arab Rep.	Iraq	Lebanon	Morocco	KSA	Tunisia
Law_title	Title of legislation										
Law_text	Text of legislation										
Category	Type of legislation: law or regulation										
Initiator	Initiator of legislation (government, a minister, MP, etc										
date_ introduction	Date when a legislation was first introduced										
date_ passing	Date when a legislation passed/became law										
affecting_ law_ first_date	Date a legislation was modified for the first time										
affecting_ law_ count	Number of modification a legislation received after passing										
bill_id	Unique source ID for the passed law/bill (on the source) -										
originator_ name	Who actually initiated the legislation; list all the names of the MPs or names government body/bodies										
originator_ affiliation	Institutional/party affiliation of the originator. For government-sponsored bills: the respective department/ministry. For MP-sponsored bills: the respective party affiliation										

procedure_ type_ standard	Expectional or ordinary procedure [English terms across all countries]										
bill_type	Categories available on the source (e.g. general laws, omnibus laws, budgetary laws)										
bill_status	Whether a bill was passed/rejected by the parliament otr neither (under consideration)										
modified_ law_id	Reference bill_id(s) of laws modified										
modified_ laws_count	Count of laws modified by the enacted law										
date_ stage_1	Date of start of first legislative step										
date_ stage_2	Date of the start of the second legislative step										
date_ stage_n	Date of the last legislative step										
name_ stage_1	Name of the first legislative step										
name_ stage_2	Name of the second legislative step										
name_stage_n	Name of the nth legislative step										
number_ stage_1	Consecutive numbering of the stage										
number_ stage_2	Consecutive numbering of the stage										
number_ stage_n	Consecutive numbering of the stage										
size_ stage_1	Cumulative depth/size of all debates during the given stage; number of characters of speeches held or the length of the report										

size_ stage_2	Cumulative depth/size of all debates during the given stage; number of characters of speeches held or the length of the report										
size_s tage_n	Cumulative depth/size of all debates during the given stage; number of characters of speeches held or the length of the report										
stages_ count	Total number of legislative stages										
committee_ count	Count of committees from the committees data table										
committee_ name	Involved Committees; list the names of all of them										
committee_ date	Date of start of committee stage										
committee_ role	Committee role: national term (e.g. in Hungary kiijelölt bizottság)										
committee_ hearing_ count	Total number of hearings (sessions) for the committees stage. Number can be larger than committee_count (row 32)										
ia_dummy	Coded 1 if an impact assessment was conducted as part of the legislative process, otherwise 0										
ia_title	Short title of the impact assessment document										
ia_text	Full text in machine processible format of the impact assessment										
ia_date	Date of publication of the impact assessment										

ia_size	Number of characters in the full text										
bill_size	Size of the bill before its 1st reading by the lower chamber, expressed in number of characters										
bill_text	Full text of the bill before its first reading										
bill_ text_ url	Full url of the bill (as collected from the source)										
law_size	Size of the enacted law, expressed in number of characters										
law_text_ url	Full url of the final law (as collected from)										
amendment_ count	Count of the number of tabled amendments during the entire legislative process										
amendment_ id	Unique source ID for the tabled amendment										
amendment_ text	Full text of the amendment										
amendment_ text_ url	URL of full text of the amendment (html/pdf/etc.)										
amendments_ stage_ name	Name of the stage in which an amendment occurred (should mirror the name from "Name of the nth legislative step"										
amendments_ stage_ number	Number of the stage in which an amendment occurred (should mirror the name from "number_stage_np"										
amendment_ committee_ name											

amendment_ plenary	Lower or upper house										
amendment_ originator	Names of MPs that submitted the amendment										
Amendment_ originator_aff	Parties of the MPs submitting the amendment or department if it is a governnment amendment										
amendment_ outcome	Amendment was approved or rejected										
amendment_ vote_for	Number of votes in favour										
amendment_ vote_against	Number of votes against										
amendment_ vote_abst	Number of absentee votes										
plenary_size	Count of the size of all plenary debates, measured as the number of characters of plenary debates during the legislative process, sum of all (recorded) debates, except committee stages										
final_vote_ for	Number of final votes in favour										
final_vote_ against	Number of final votes against										
final_vote_ abst	Number of final absentee votes										

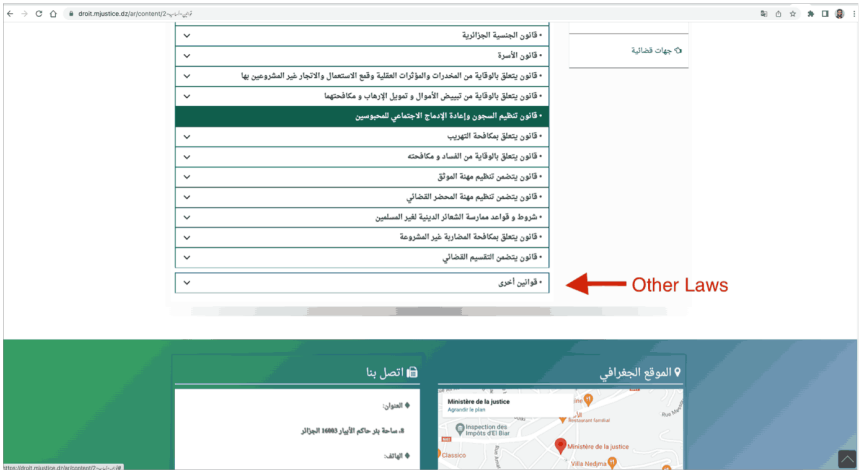
Appendix D. MENA Data Annotation Guide

This appendix provides a detailed overview of the website structures and core variable list that was presented in section 5 of the main text based on annotated screenshots for each country.

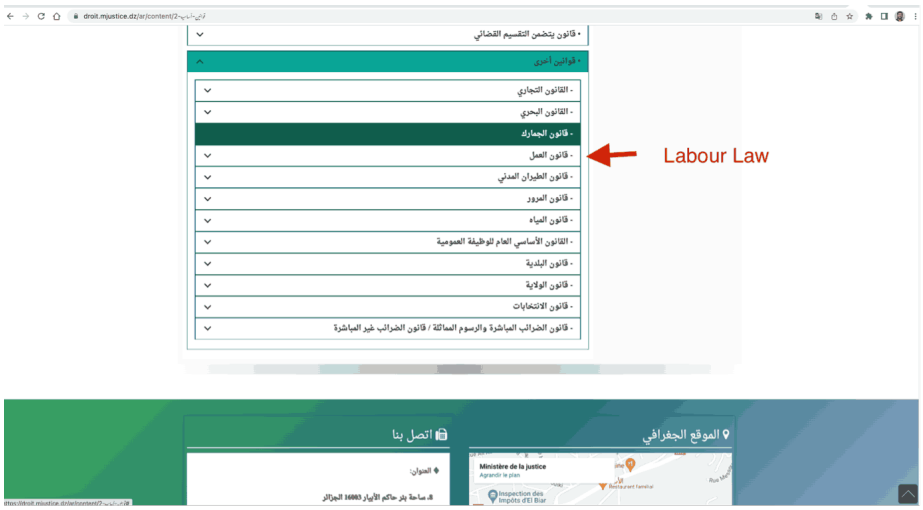
D.1 Algeria

This portal serves as a comprehensive resource for accessing the laws and regulations of Algeria. On this page we can find the basic laws by subjects.

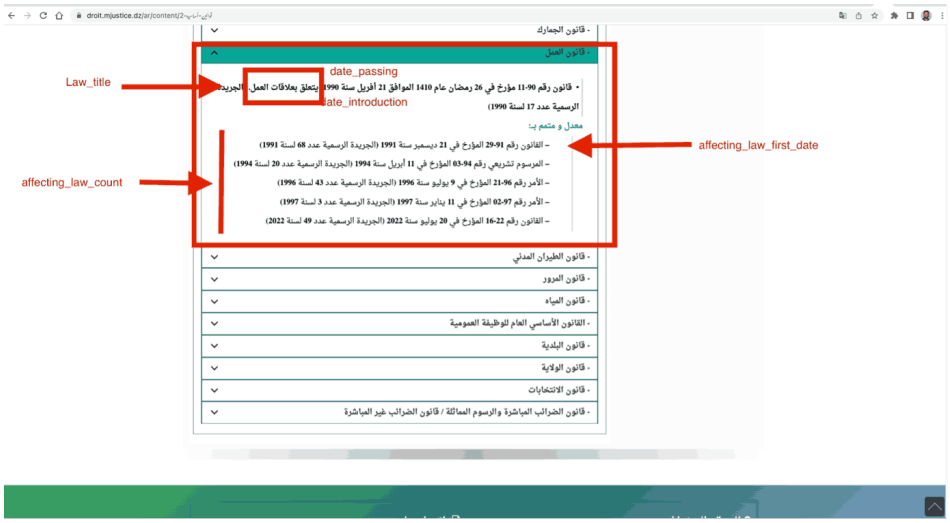
Scroll down to open labour law for our reference. Click on the other laws.



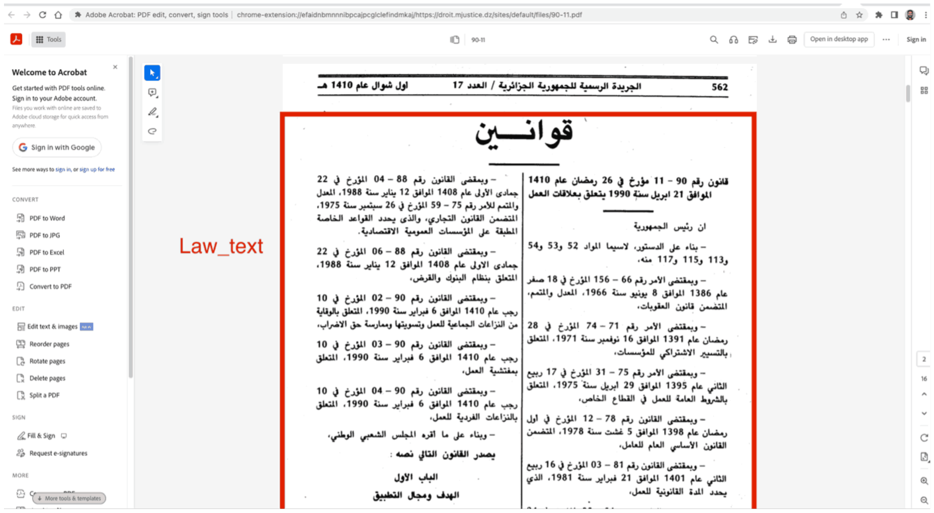
Select the labour law.



By clicking on the labour law, we get access to some of our variables.

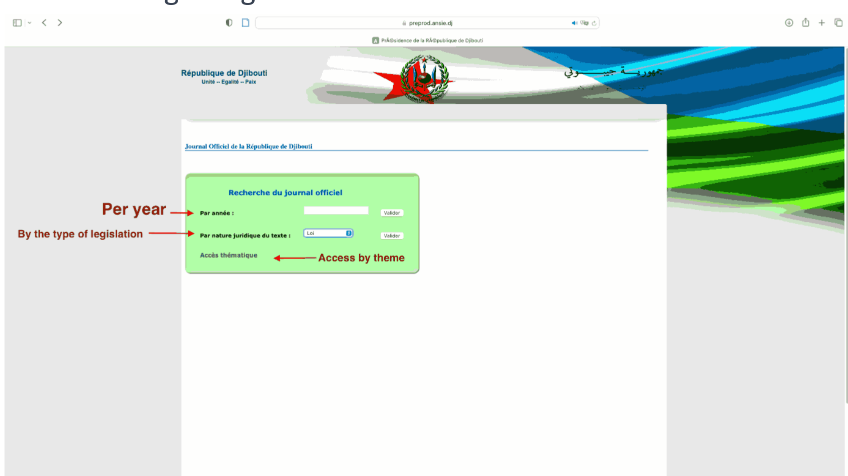


The box displays the modifications that have taken place since the enactment of the initial law. By clicking the versions of the law, the pdf file of the official Gazette opens, where we can get the text of the law.

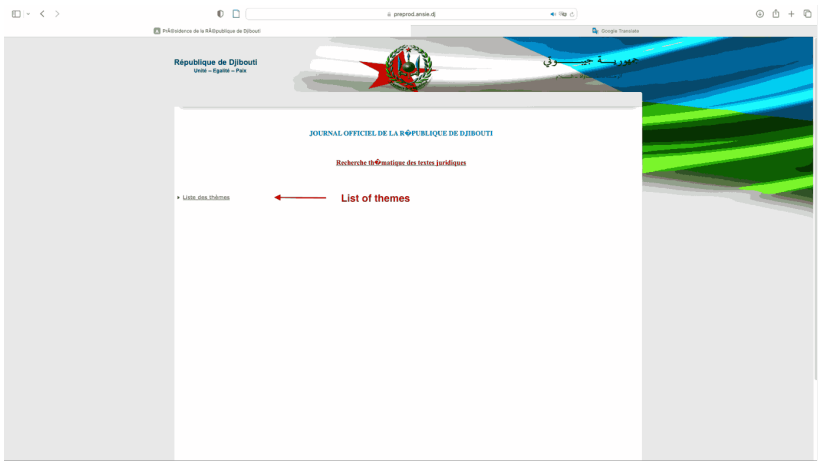


D.2 Djibouti

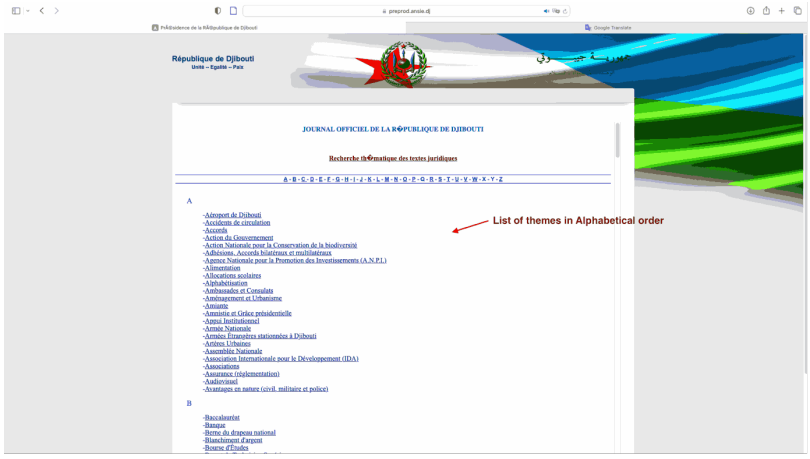
The official website of the Gazette Officielle de Djibouti contains the laws of Djibouti. The website is primarily in French, so although I am not an expert in this area, I will do my best to provide an explanation using Google Translate.



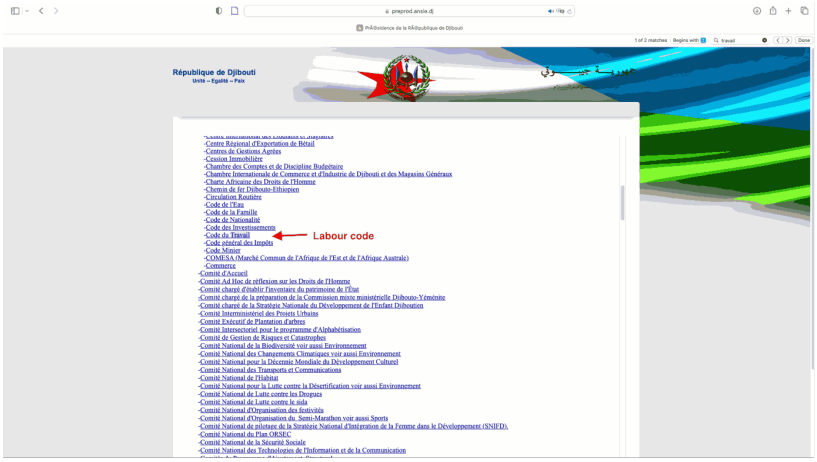
Once on the home page, we can access the laws by themes or by year. We will search by clicking on the themes. We will get the list of the themes.



By clicking on the list of themes, we can access the laws by themes in alphabetical order.

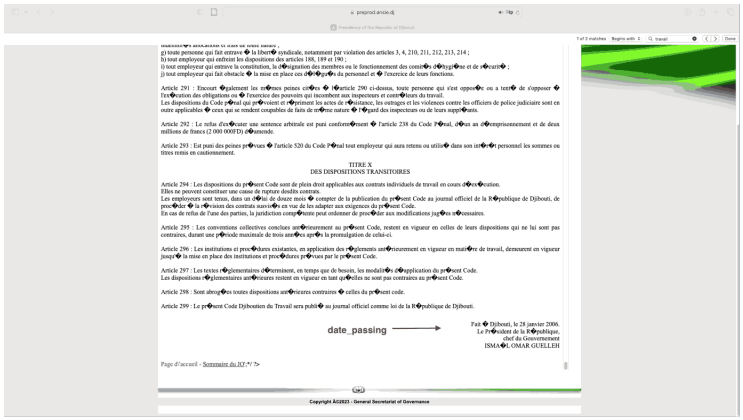


We will use the labour code for our reference.



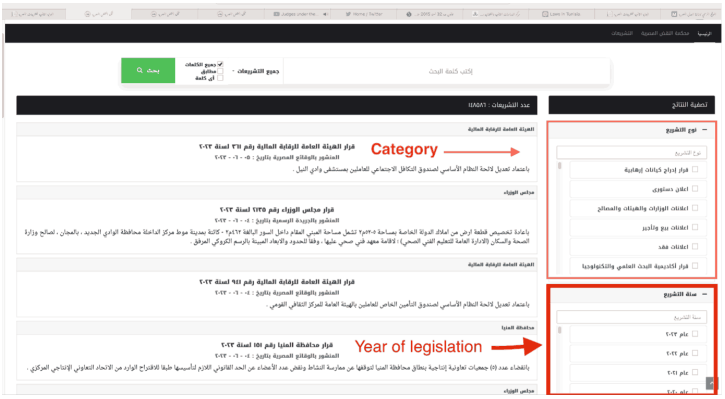
By clicking on the labour code, we get access to laws and regulations related to labour law.

To access the “**date_passing”** scroll down to the end of page.

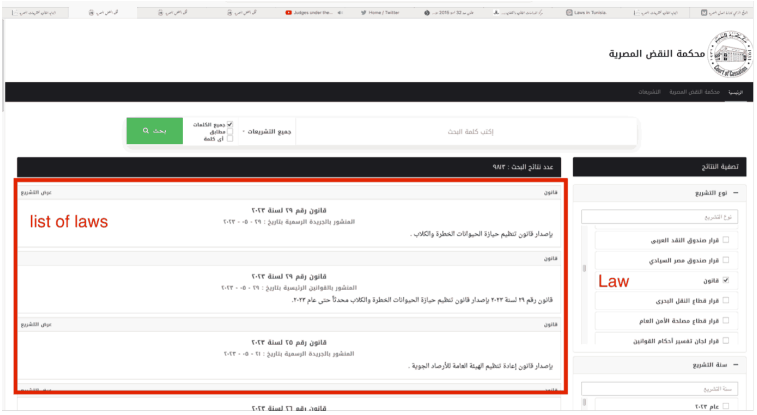


D.3 Arab Republic of Egypt

This website serves as a reliable source for accessing the extensive collection of laws and regulations of Egypt.
Once on the homepage, we can find the laws by category and by year.



By selecting the “law” we can get the list of the laws.

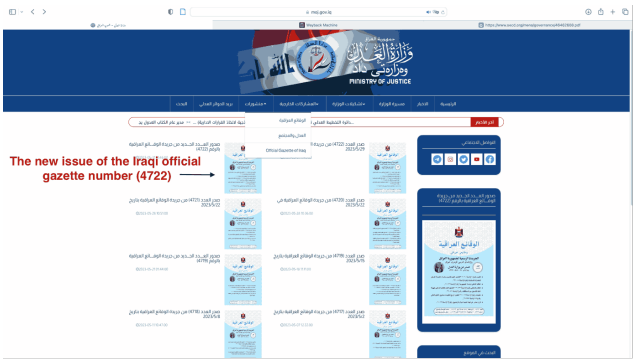


By clicking on any law, we can get our variables. We will take the example of labour law for our reference.

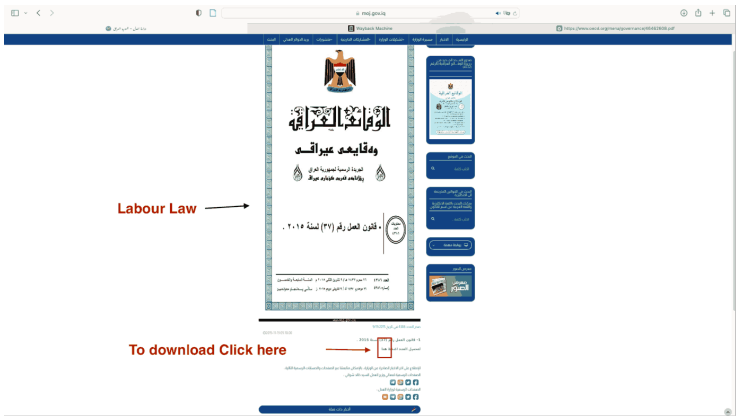
On the next page we can find our variables.

D.4 Iraq

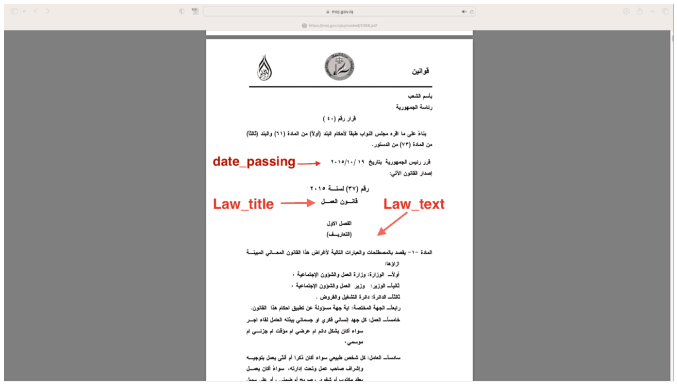
The Iraqi Ministry of Justice is the official publisher of the [official gazette](#) of Iraq, which serves as the primary database for Iraqi laws.



By clicking any issue, we can access the laws. We will use the official gazette number 4386 dated 09/11/2015 for the labour law.

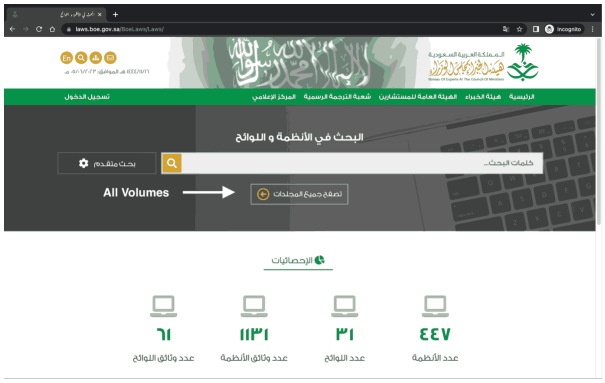


By clicking download we can get the pdf file of the official gazette. In the Pdf(searchable) we can find some of our variables.

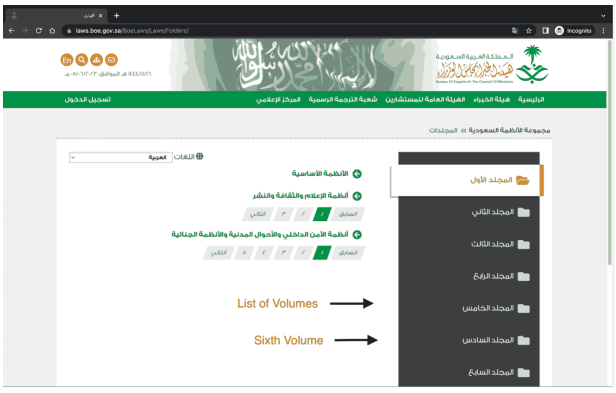


D.5 Saudi Arabia

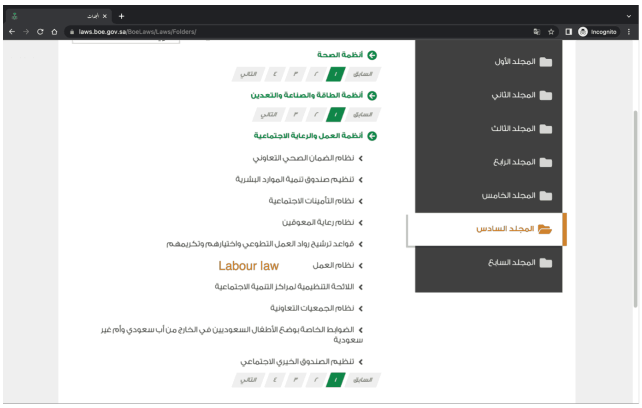
This website features an extensive compilation of laws and regulations specific to the Kingdom of Saudi Arabia (KSA). It serves as a central hub for accessing and exploring the legal framework governing various aspects within the country. Once on the page look for the “All Volumes”.



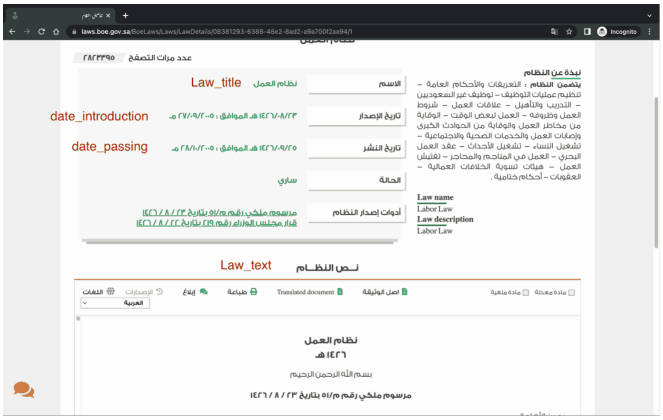
Click on the “All Volumes” to access all the laws.



We will take the labour law for our reference. Go to the sixth volume and open it.

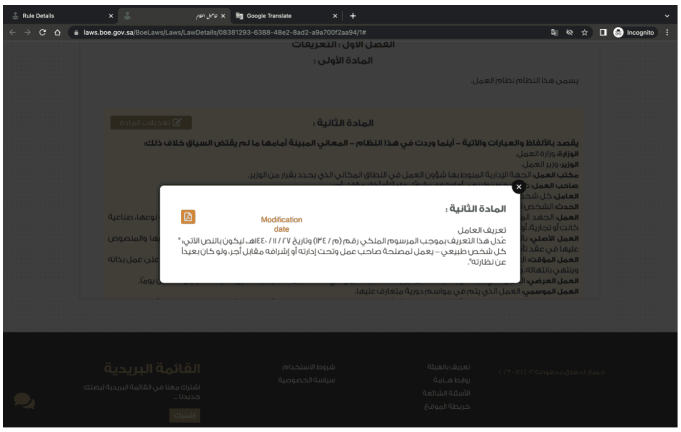


By clicking on any law, we can get access to the text of the laws. By clicking on the labour code, we can find our variables here.



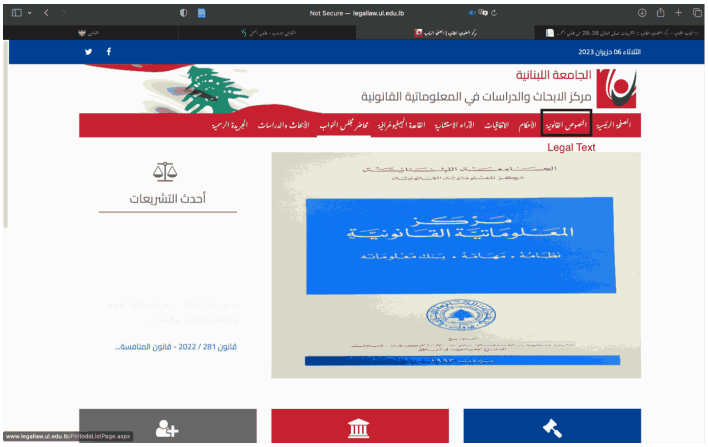
We can find modifications in the law through this website. All the modifications with the dates are highlighted in yellow colour.

Click on the Article Modification and we will get the details of the modification.

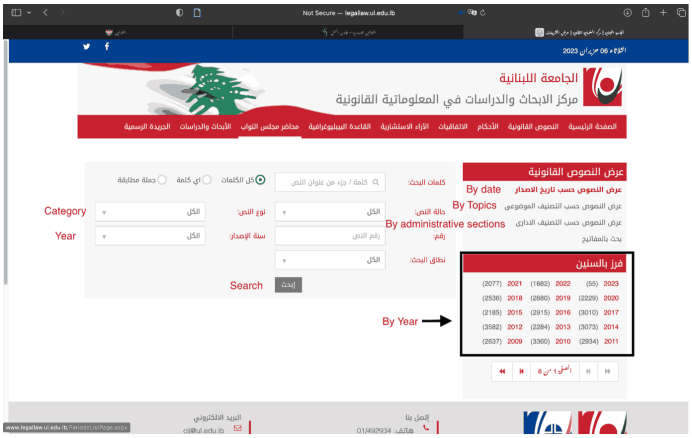


D.6 Lebanon

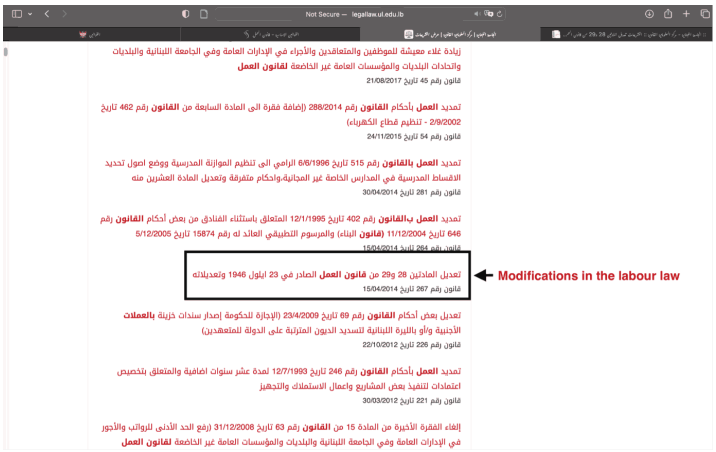
The website of the University of Lebanon hosts a comprehensive collection of laws and regulations pertaining to Lebanon.



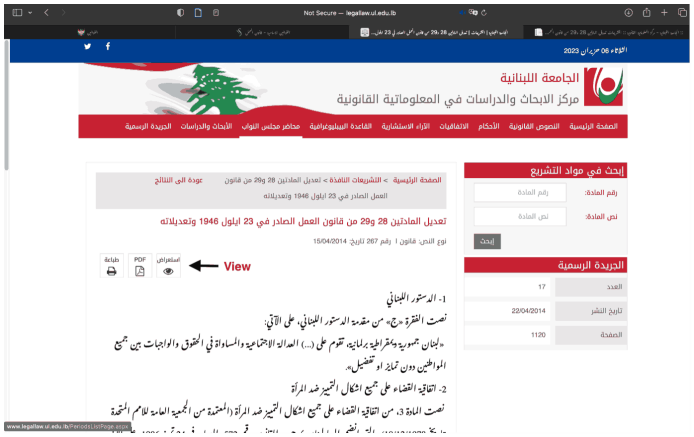
Once on the homepage look for the legal texts. By clicking on legal text, we can reach the portal of laws and regulations.



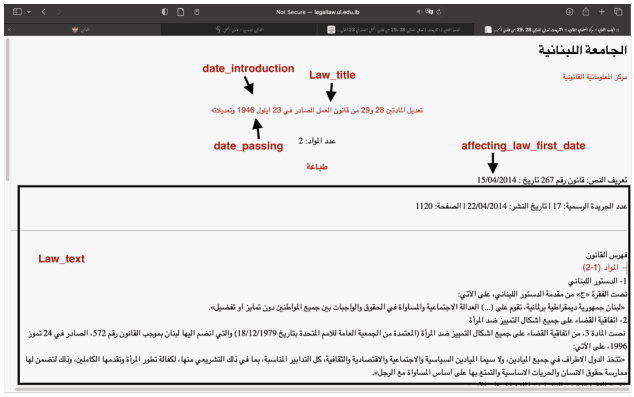
We will take the labour law by writing “قانون العمل” (labour law) for our reference.



By clicking on the law, we can access the [labour law](#).

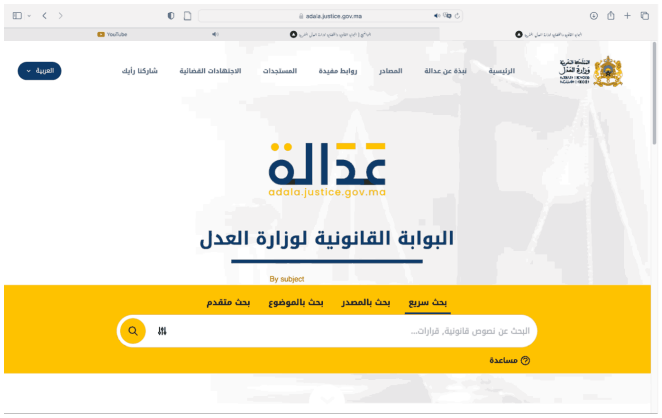


For a better view, we click on the view. On this page we can see our variables.

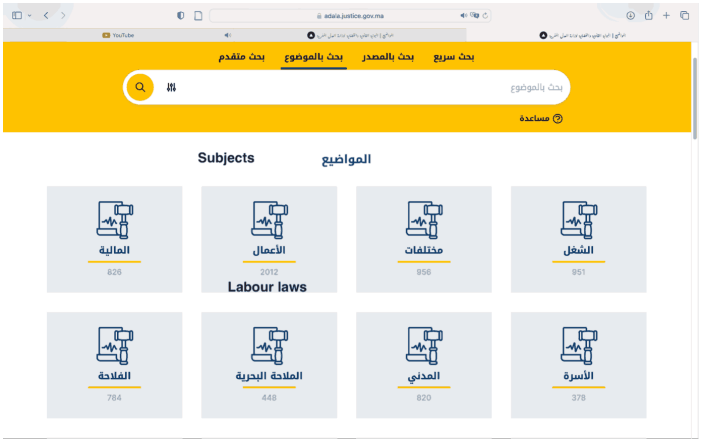


D.7 Morocco

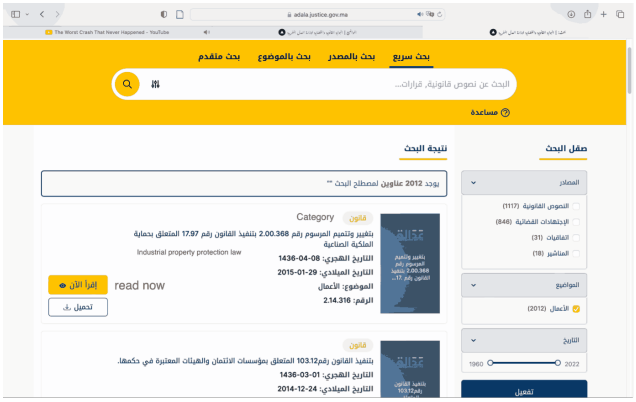
The website of the ministry of justice serves as the primary platform for accessing legislative data of Morocco.



Once on the portal, we can search the laws through this portal. We will search by subject.



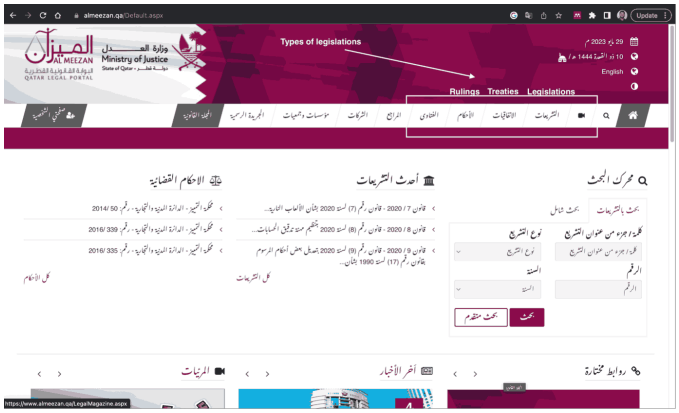
After clicking on the subject, we get the list of laws related to the subject.



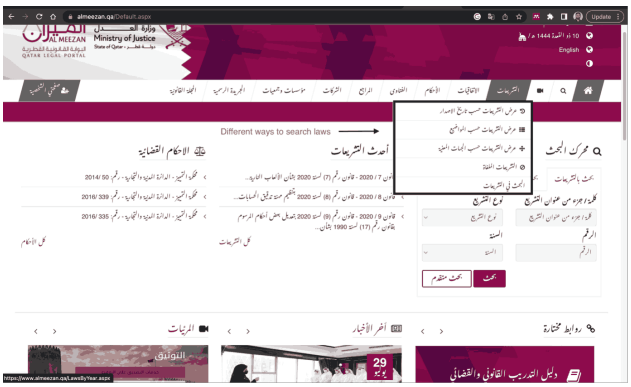
We will utilize the Industrial Property Protection Law as our reference. By simply clicking on the 'Read Now' option, we gain access to the complete text of the law. We can find our variables here. We can't find the "affecting_law_count" but we can find the amended articles in the text, and we can also find the previous version of law by clicking the "previous law number".

D.8 Qatar

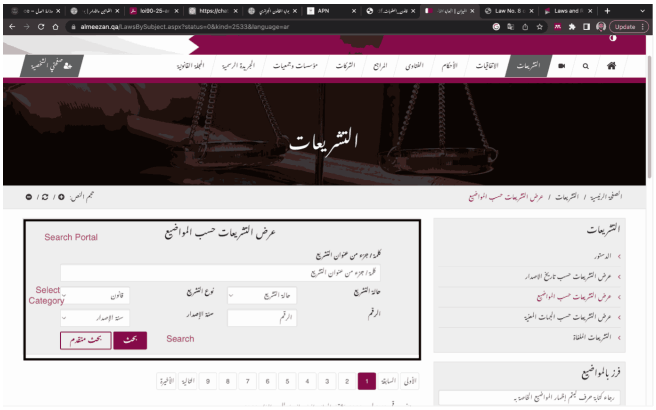
The almeezan website is the main website for the collection of legislative data in Qatar. Once on the homepage look at the top right, we can find the types of laws.



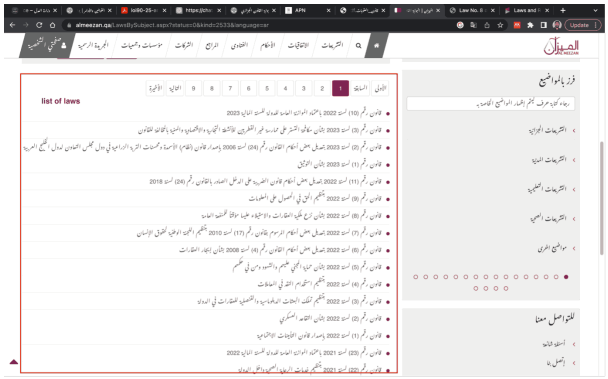
By clicking on legislation, we can find the laws in different ways. By subject or by date.



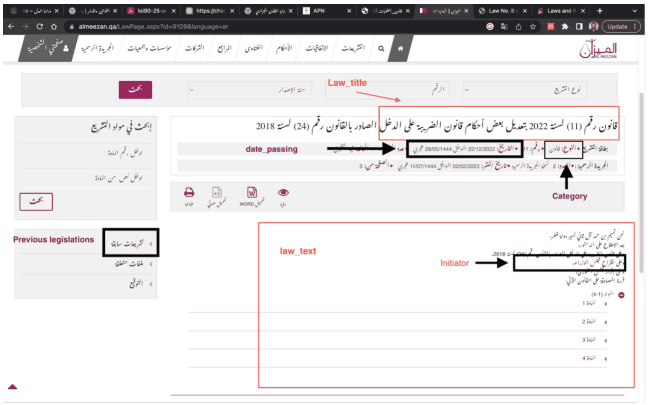
A single click will land us on the portal page where we can find the list of the laws and regulations. To search by type of legislation, select the category. We select law for this example.



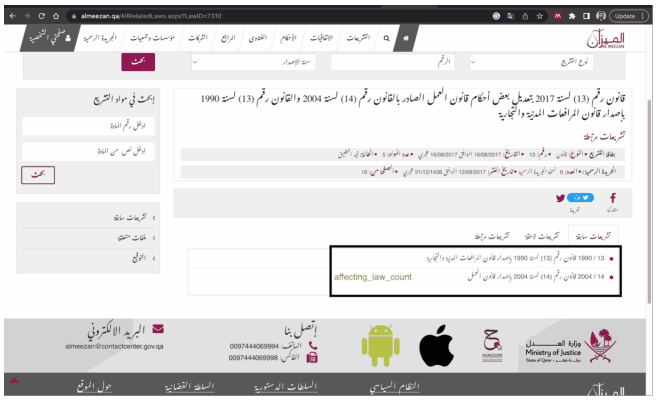
We get the list of the recent laws.



From the list of the laws, for example we can take Law No. (11) of 2022 amending some provisions of the [Income Tax Law.]() If we click on the law, we can get our variables.

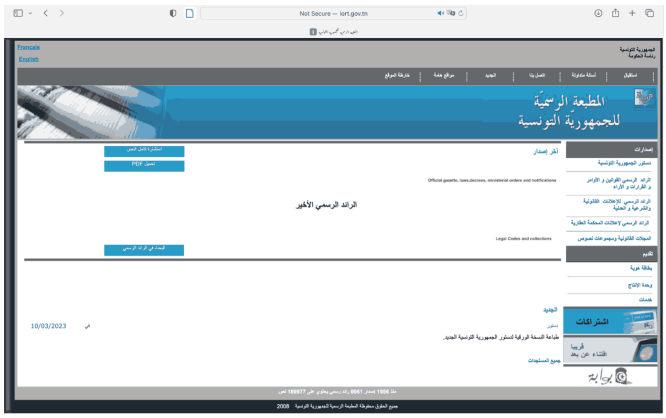


By clicking on “previous legislations” we can see the amendments in law.



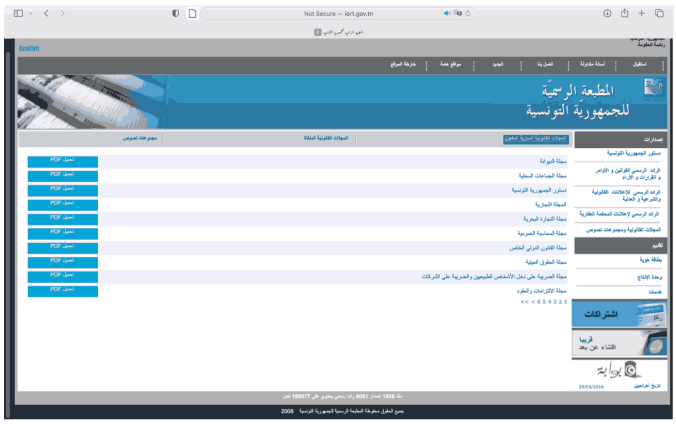
D.9 Tunisia

The website of the [Official Gazette](#) of Tunisia is the place to find Tunisian Laws and regulations.

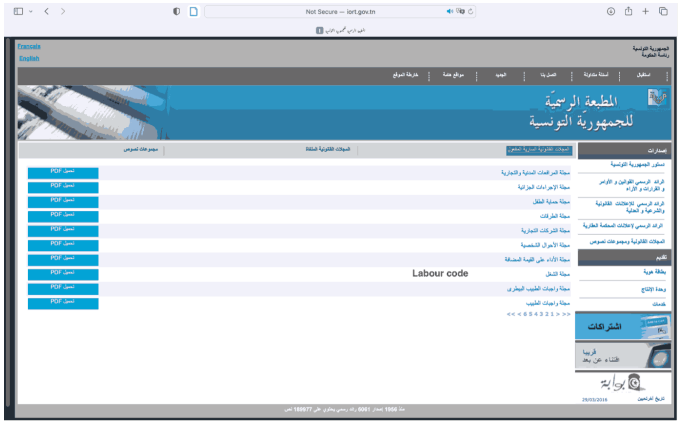


There are two ways to access laws: by exploring the official gazette and searching within legal codes and collections.

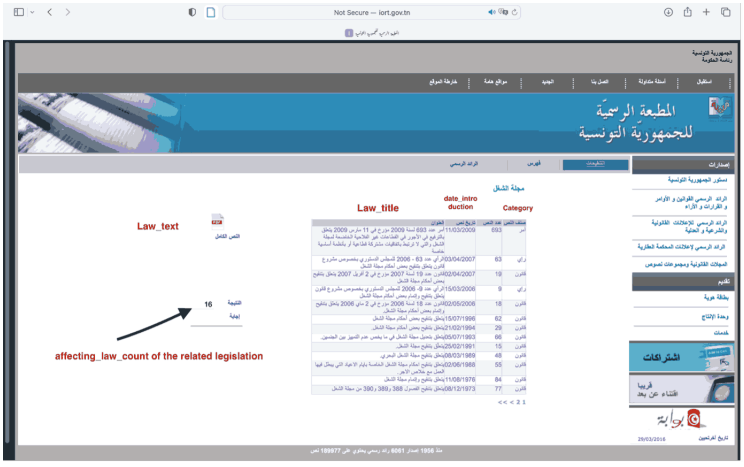
Once you're on the homepage, look for a section or menu dedicated to "Legal codes and collections”. This section is located on the right side of the page. By clicking on the “Legal codes and collections” we access the laws and regulations of the specific codes.



Go to the second page of the current list to access the labour code. The labour code will be used here.

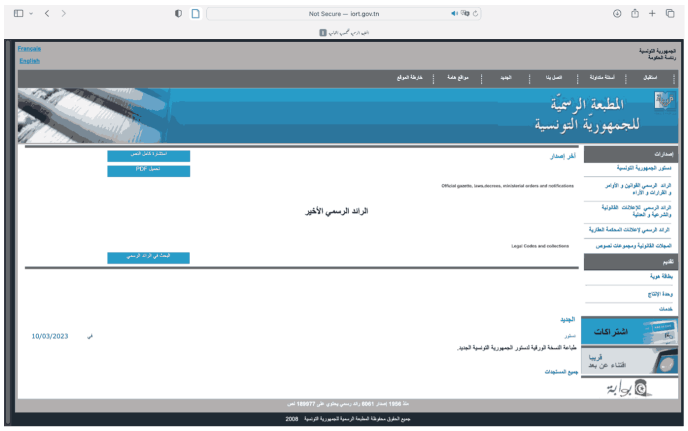


By clicking on the Labour code, we can access the laws and related legislations about the labour code. On the next page we can find our variables.

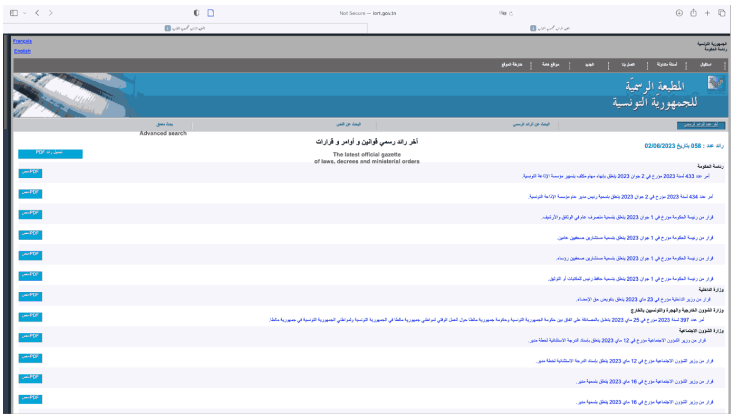


By clicking on any legislation, we can get the text of the legislation. The text example can be found in the end.

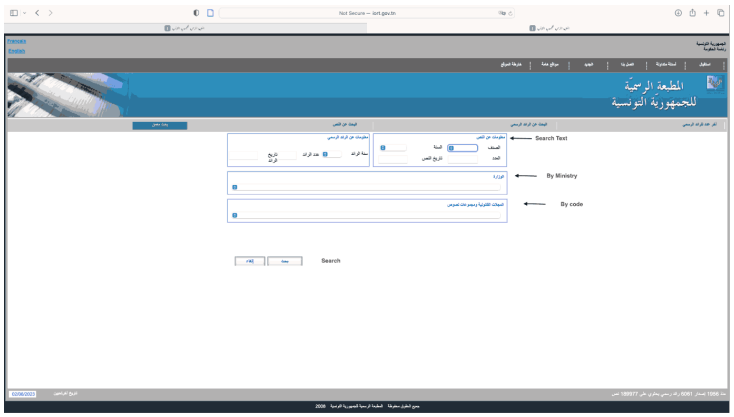
The second way to access the laws is searching through official gazette.



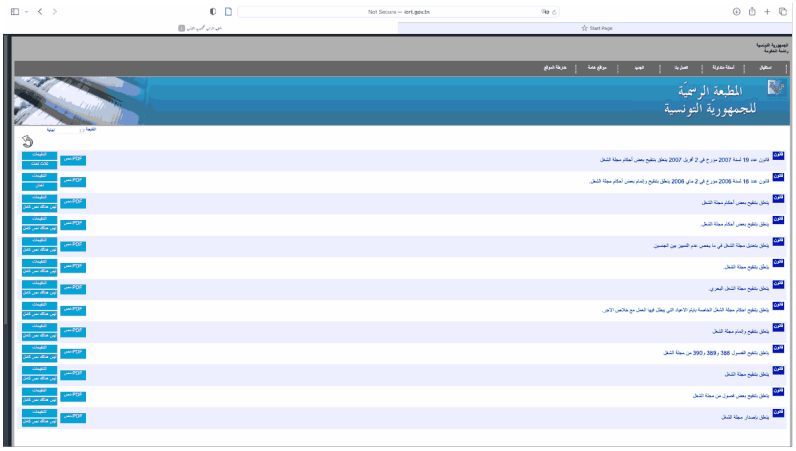
To access the latest laws and regulations, we can click on the "Official Gazette" section of the government website.



Go to the advance search. Here we can find law by subject or by ministry of by code. We will use the labour code for this example.



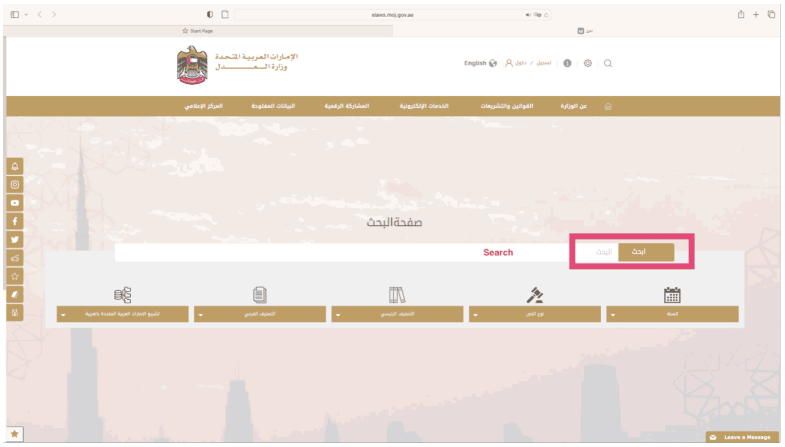
By selecting the Labour Code in the “by code” bar we get the laws and regulations about labour.



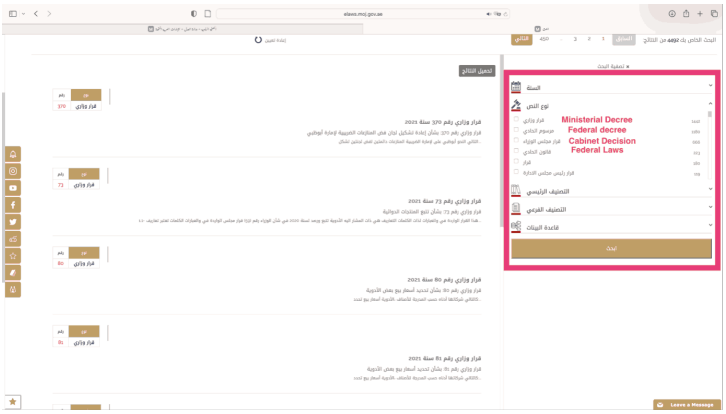
By clicking the law, we can get the text of the law anc our variables.

D.10 United Arab Emirates

The Ministry of Justice's website is the main website for the collection of legislative data in UAE.

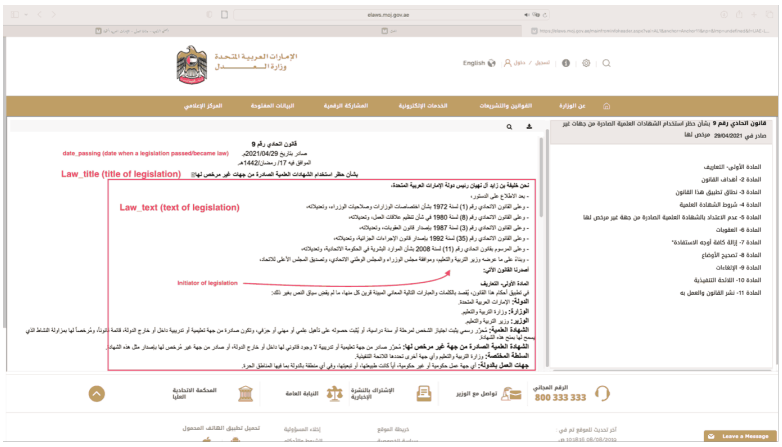


If you click on the search bar you will land the page where all types of laws and regulations are available.

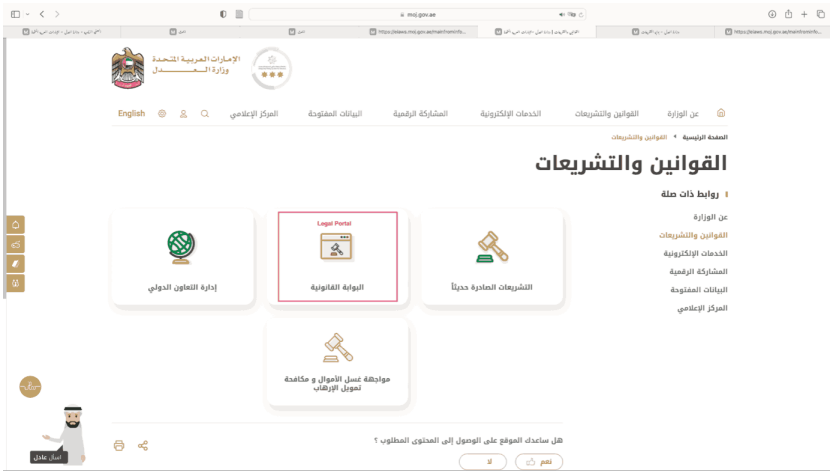


On the right side we can select the types of the Laws.
Once the types of law are selected the Ministry of justice website with a list of all laws in UAE can be reached.
Click on the any law and the full text of the law will be open.
On this page we can find our variables

- date_passing
- Law_title
- Law_text
- Initiator
- date introduction



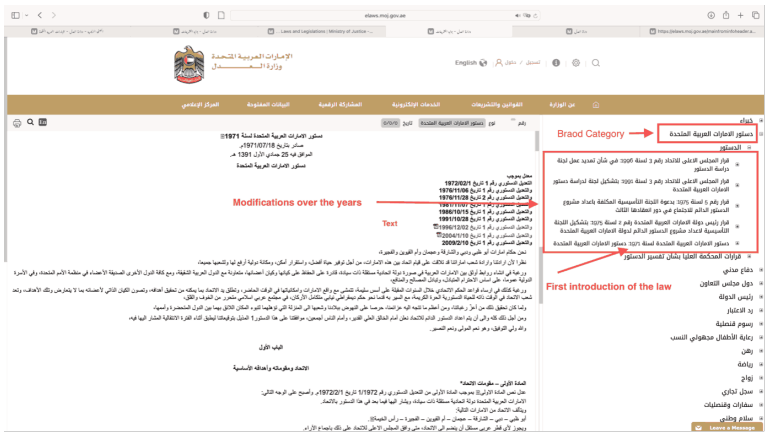
The above-mentioned website doesn't provide us with the "**date_introduction**,, **affecting_law_first_date, affecting_law_count**. However, another page of the MOJ website provides us with some details.



We will get this page.

We click on the Federal Laws; we will get related laws and regulations under broad categories.

On this page we can find the if we click on the category we can find **affecting_law_count**, **date_introduction**, and, **affecting_law_first_date** for some categories.



If we click on the last line of the category, we can access the first draft and the last article of the law tells us exactly when the first-time law was passed.