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OFFSHORING'S IMPLICATIONS IN ICT SERVICES FOR LABOR AND MIGRATION IN MOROCCO AND TUNISIA, 2010-2024

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Abstract

The paper examines the impact of offshoring in information and communication services on employment and migration in Tunisia and Morocco, two economies that are increasingly integrated into global production networks. The objective is to assess whether offshoring has contributed meaningfully to job creation and influenced migration trends in both countries over the past 14 years. Using a mixed-methods approach, the study combines empirical analysis of sectoral employment and net migration data with a review of national policies and structural labor market characteristics. The findings reveal that while offshoring has led to some increase in service sector employment, its overall impact on total employment remains limited due to persistent structural constraints and limited integration into knowledge-intensive sectors. Moreover, no significant impact was found on migration rates due to structural factors such as human development, irregular migration, and state policies that actively promote emigration as a means of development. Thus, it can be further explored with additional factors and over longer periods. The findings imply that for offshoring to become a more effective lever of development, Tunisia and Morocco must implement policies that foster higher-value employment, invest in skills training, and create more balanced incentives between offshore and onshore investment regimes.

Keywords

offshoring, employment, migration, policy impact

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1. Introduction

1.1. Issue and Background of the Topic

In the age of digital globalization, the rapid expansion of Information and Communication Technology (ICT) has significantly transformed global labor markets, particularly through offshore outsourcing, which redistributes production processes across borders. Over time, lower-middle-income countries (OECD, 2025) have shifted their role in the global value chain, from initially focusing on low-skill production of intermediate goods to becoming centers for business services, and more recently evolving into manufacturing hubs for high-skill tasks such as IT, software development, and other ICT services (Basu & Chau, 2022).

In the Francophone world, the Maghreb region stands out as the most accessible nearshoring destination for French companies, with Morocco and Tunisia emerging as key hubs for offshoring (Kearney, 2023). Morocco, in particular, has significantly strengthened its global position, climbing 12 spots to rank 28 in outsourcing competitiveness as shown by the Kearny Global Services location Index of 2023, whereas in 2024, the city of Tunis was ranked by the Kearney Global Cities index at 123 from 156 cities recognized as internationally connective and influential metropolitan areas (Kearney, 2024). The country's emphasis on digital upskilling has further solidified its position as a strategic hub for tech-driven business services. Backed by government initiatives, the country is channeling major investments into the outsourcing sector, with plans to generate approximately 5,000 new jobs by 2026. Tunisia, on the other hand, has been paying attention to offshoring since 1972 by creating a specific regulatory regime that offers firms tax and duty incentives (Baghdadi et al., 2019). Between 2010 and 2022, the number of offshore enterprises in Tunisia grew steadily, with an average annual growth rate of nearly 5%. While some fluctuations were observed, such as a decline in 2018, the overall trend indicates a sustained expansion, reflecting Tunisia's strengthening position as an attractive offshoring hub.[1]

Faced with this changing reality of job migration, offshoring to new emerging areas raises the issues of its socioeconomic impact on the labor market, labor rights,[2] and economic migration. Precisely, competing in the Global Value Chain today exerts a powerful disciplinary force on both governments and private sectors, by means of establishing financial pressures to guarantee adherence to market-friendly policies (Gill, 1998). Economic migration has accompanied the strengthening of offshoring trends due to the continuous gap between the 'core' home countries, from which offshoring emerges, and host countries (Żuk, 2020). For instance, in these host countries, also referred to as 'peripheral' countries, governments often create deregulated economic zones to attract foreign investment, leading to a weakening of labor protections, environmental standards, and fiscal regulations, fostering the phenomenon of social dumping (Matešić & Omazić, 2023).[3]

Cheaper labor costs, besides other factors like the country's position in migration chains and the regulatory framework surrounding outsourcing, influence its attractiveness to foreign investment and the type of tasks offshored to it, as well as the potential impacts of this process on their migratory profiles. For instance, the

promotion of investment and encouragement for export-oriented labor have been prioritized in the preface of the Moroccan Labor Code since 2003 ((Moroccan Labour Code, 2003). For Tunisia, the existence of a special regime for offshoring started in 1972, supported by different investment-related regulations, recently promulgated in a unified version in 2016 (Law n° 2016-71 of September 30th, 2016).

Despite the clear upward trajectory in offshoring activities to Morocco and Tunisia, and the regulatory reforms surrounding it, there remains a limited understanding of how these transformations affect labor and migration flows in host countries and policy responses to these changes (Gurtu et al., 2016). Furthermore, the study of offshoring in North African countries remains limited due to the emerging aspect of these countries as offshoring locations (Baghdadi et al., 2019). Therefore, this research aims to answer the following question to study the impact of offshoring activities in ICT services on Tunisia and Morocco: What are the socioeconomic consequences of the rising offshoring intensity in Tunisia and Morocco, particularly regarding employment and migration trends and policy?

1.2. Novelty compared to existing literature

Outsourcing has been defined as the process by which a company delegates specific tasks or functions to an external provider rather than handling them in-house. This allows businesses to optimize resources, focus on core activities, and leverage external expertise. Offshoring, on the other hand, involves relocating business operations or services to another country. This can be done through a fully owned subsidiary, known as a captive unit, or by partnering with a third-party service provider. While outsourcing primarily addresses the question of whether a task should be performed internally or externally, offshoring focuses on the geographical aspect, determining whether an operation should be conducted domestically or internationally (Sharma & Loh, 2009). Besides the geographical dimension in defining offshoring, the legal qualification of this business strategy[4] depends on other factors, such as the level of control and partnership between parties (Troacă & Bodislav, 2012). Hence, offshore outsourcing falls under the umbrella of outsourcing, while incorporating a geographical element (Sreedevi & Tanwar, 2018).

The commodification of information technology services has significantly driven the rapid expansion of outsourcing practices. As information technology functions become increasingly standardized and less differentiated, organizations have turned to outsourcing as a strategic approach to concentrate on core, high-value activities while minimizing operational costs. This evolution has given rise to specialized outsourcing, wherein distinct service providers manage specific IT operations, including data center administration, client/server infrastructure, and technical support services. Consequently, outsourcing has evolved beyond traditional IT infrastructure management to encompass integrated digital business solutions, playing a pivotal role in shaping the future dynamics of global enterprise operations (Kakabadse & Kakabadse, 2000).

Defining offshorable tasks is challenging due to the variety and evolution of activities and ICT. However, the European Foundation for the Improvement of Living and Working Conditions has tried to identify these tasks based on their telemediability, that is, the capacity to be performed remotely via telecommunications networks. From a sectoral perspective, tasks can be either within ICT-producing sectors, such as data processing or software services, or ICT-using sectors like finance (Huws & Dahlmann, 2004). The determination of tasks on the basis of services is proxied, from the Nomenclature of Economic Activities of the European Union, by NACE sector K.72, relevant to computer-related activities, and sector K.74, related to other business activities (European Commission, 2025).

Research on outsourcing has been developed around focal questions, such as the factors that encourage and weaken outsourcing, the object and the extent of it, the type of this operation (ie, whether captive firms or offshore third-party), and the outcomes of offshore outsourcing (Kakabadse & Kakabadse, 2000). The study of these outcomes includes, first, the offshoring decision, regarding the location (Stoian & Filippaios, 2014), and factors like political and regulatory conditions that might influence these decisions, besides the availability of competencies (Kearney, 2023).

The impact of offshoring in the literature was addressed in the context of job creation and brain drain (Khan & Islam, 2006), besides concerns about the role of working conditions, inequality of income, and the development of poverty in various countries (Auer et al., 2005). In fact, research, especially in the context of offshoring economies, has consistently found that offshoring tends to have uneven effects across the labor market. While high-skilled workers may benefit or remain largely unaffected, medium- and low-skilled workers often experience job displacement or wage pressure. These effects are more pronounced in sectors where tasks can be easily outsourced, reinforcing labor market polarization and contributing to rising income inequality in some regions (Keuschnigg & Ribi, 2009).

Offshoring and migration, on the other hand, have been studied as outcomes of globalization that influence labor market outcomes (Beverelli et al., 2011). The main lines of focus are related to the productivity effect, referring to the increase in productivity in complementary roles due to the loss of certain offshored jobs. The latter is discovered under the effects of displacement. Another outcome discovered in the literature on offshoring and migration is the task sustainability effect, where natives and offshore workers perform either similar or different, yet complementary, functions (Beverelli et al., 2011).

This study advances the literature by shifting attention to the underexplored perspectives of host countries in lower-to-middle-income countries, specifically Tunisia and Morocco. Unlike existing research that largely focuses on labor market effects in home countries, this paper evaluates how offshoring reshapes the labor market effects in host economies. This paper assesses how offshoring influences employment and migration trends within host economies. Furthermore, combining macroeconomic indicators with sociological analysis it offers an interdisciplinary framework for understanding the broader societal impacts of offshoring. Lastly, it

addresses the interconnected dynamics between offshoring, employment, and migration, which are domains often examined in isolation, while grounding the analysis in the specific regulatory framework of these countries and their employment and migration profiles.

1.3. Research structure and methodological overview

This study is structured into four sections. The introduction outlines the study's background, scope, and contributions relative to existing literature. The main body comprises two sections analyzing the impacts of offshoring in the ICT sector on employment and migration, respectively. Each section includes theoretical and empirical background, data description, descriptive statistics, regression analysis, and a discussion of results in light of regulatory and labor/migration trends in Morocco and Tunisia. The conclusion summarizes the findings, highlights policy implications, and discusses the broader potential benefits and drawbacks of offshoring in both contexts.

To examine the impact of offshoring in the ICT sector on labor and migration outcomes in Morocco and Tunisia between 2010 and 2024, the study employs a mixed-methods approach, combining descriptive data analysis with qualitative data analysis. Quantitative data are sourced from secondary databases, including UNCTAD, ILO, and the World Bank, which cover indicators related to trade in services, foreign direct investment, employment, and migration. Due to the absence of direct measures of offshoring, the study uses ICT service exports as a proxy. Two fixed-effects panel regressions are furthermore applied: one analyzing the effect on employment in services, and the other on net migration, controlling for macroeconomic and demographic variables such as inflation, minimum wage, and technology readiness. The analysis enables a comparative evaluation of how digital offshoring influences domestic labor markets and migration dynamics in the two countries, supported by a contextual analysis of regulatory frameworks surrounding offshoring and migration, as well as triangulation with the literature.

2. Theoretical background

In the Global Value Chains context, firms no longer operate as isolated entities producing entire goods or services within national boundaries. Instead, they participate in globally integrated networks where each stage of production, from research and design to manufacturing and service delivery, is performed where it can be executed most efficiently. Offshoring contributes to this global modularity by enabling firms to optimize their input-side operations across borders, aiming for cost efficiency, access to talent, and innovation capacity (Schmeisser, 2013). Hence, countries' competitiveness is no longer only measured by their export performance but also by how much they have integrated international production networks. In this context, offshore zones refer to specific jurisdictions that offer legal, fiscal, and administrative incentives intended to attract foreign capital, often facilitated by labor and regulatory arbitrage (Lutsyshyn et al., 2019).

In labor-market-related theories, the neoclassical idea of a unified market should be set apart, as it fails to capture the real dynamics of the market today. Instead, the labor market can be envisioned as a network of dispersed, decentralized spaces where firms and job seekers independently search for each other. In this context, studies examining the relationship between offshoring and unemployment frequently draw on search and matching models, particularly those inspired by the Pissarides framework of equilibrium unemployment (Pissarides, 2000). Theoretical extensions of search-and-matching models have demonstrated that labor market institutions, such as collective bargaining frameworks, recruitment costs, and social protection policies, can significantly mediate the effects of offshoring on wages and unemployment (Ranjan, 2013).

The impact of offshoring on employment was introduced in a task-based framework by Grossman and Rossi-Hansberg on three distinct but interconnected channels: productivity, relative price, and labor supply effects. In fact, offshoring low-skill tasks can lower production costs and raise demand for domestic labor in the short term—a productivity effect—especially when it complements rather than replaces local workers. However, this is offset by the relative price effect, where global competition reduces prices and puts downward pressure on wages. Additionally, the labor supply effect may flood the market with displaced low-skilled workers, further depressing wages. These impacts are uneven, with high-skilled workers often benefiting, while low-skilled workers face greater adjustment costs (Grossman and Rossi-Hansberg, 2008).

When assessing the impact of offshoring on migration, the literature often begins with economic migration, initially drawing on traditional trade theory. For instance, traditional international trade models, particularly the Heckscher-Ohlin framework and its extension by Samuelson, assume that labor is immobile across borders. For instance, a labor-rich country will specialize in and export labor-intensive products. Complementing this is the Factor-Price Equalization theorem, which states that, under free trade, the prices of factors, such as wages for labor and returns to capital, should converge across countries, even in the absence of actual migration. In this sense, trade in goods can mimic the economic effects of the labor movement, with exports of labor-intensive goods functioning as a proxy for exporting labor itself. Migration, in this view, is simply another channel through which international economic integration occurs; it can be seen as an alternative mechanism for achieving factor price convergence (Borjas, 1989). However, this model does not appear to provide predictive power on the size and composition of migrant flows, especially with the increasing complexity of migration.

On the other hand, Harris and Todaro's neoclassical migration theory suggests that migration is guided not by absolute income differences but by expected income, factoring in job probabilities. The model examines migration that occurs when expected urban income exceeds rural earnings, even in the presence of urban unemployment (Harris & Todaro, 1970). However, within a broader framework, the dual labor market theory suggests that migration is not primarily driven by individual cost-benefit

analysis, but rather by structural needs in advanced economies. According to this theory, richer countries have a segmented labor market, with a primary sector offering stable, well-paid jobs and a secondary sector characterized by low wages, instability, and poor working conditions. Native workers avoid these "secondary" jobs, creating a persistent demand for migrant labor to fill them (Piore, 1970).

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The relationship between offshoring and migration is further illuminated by the migration-development nexus, a critical lens for understanding the complex, non-linear ways in which development processes and migration interact (De Haas, 2007). Traditional migration theories, such as the Harris-Todaro model (Harris & Todaro, 1970) and Piore's dual labor market theory (Piore, 1979), primarily focus on economic differentials and structural demand for labor. However, the migration-development nexus, particularly as articulated by Hein de Haas (De Haas, 2021), moves beyond simple push-pull factors by introducing the aspirations-capabilities framework. This framework posits that migration is a function of both the aspiration to migrate (driven by relative deprivation, social comparison, and perceived opportunities abroad) and the capability to do so (determined by resources, networks, and legal constraints). In the context of ICT offshoring in Morocco and Tunisia, the limited job creation and persistent structural unemployment fail to reduce the aspiration to migrate. Crucially, however, the offshoring sector may inadvertently increase the capability for migration. By providing high-skilled ICT workers with internationally recognized skills, professional networks, and higher, albeit still relatively low, salaries, the sector equips them with the human and financial capital necessary to overcome the costs and risks of international mobility. This dynamic suggests that a growing, yet structurally limited, ICT offshoring sector may not act as a "brain gain" mechanism, but rather as a "brain circulation accelerator", facilitating the emigration of its most skilled workers. Over time, migration becomes self-reinforcing, leading to diaspora formation. This outcome is primarily explained by the causation theory, which suggests that as more people from a community migrate, social networks form, reducing the costs and risks of migration for others and creating a feedback loop that sustains and expands migration flows, regardless of initial economic conditions (De Haas, 2021).

In conclusion, taken together, these theoretical frameworks highlight how offshoring reshapes both employment structures and migration patterns through interlinked channels. While task-based models emphasize shifting labor demands and wage dynamics, migration theories reveal how labor mobility responds not only to economic signals but also to institutional and structural forces. In the context of Morocco and Tunisia, these dynamics are further shaped by national labor markets, offshore and investment policy regimes, and the countries' position in regional and international migration dynamics. The following sections examine these interactions empirically, using panel data analysis with qualitative regulatory and policy analysis to evaluate the specific labor and migration outcomes of ICT offshoring in both countries from 2010 to 2024.

3. Data and Methods

Data are collected for both countries from 2010 to 2024, from secondary sources, covering labor and employment, migration, demography, and macroeconomic indicators. The purpose of this collection is to conduct descriptive statistical analysis, as well as regression analysis. Two separate regression models were employed to examine the direct impacts of employment and migration. To measure the impact of offshoring on employment, the paper employs Fixed Effects to account for the differences between entities. In contrast, the migration impact model employs a regular pooled OLS model because there is not enough variation between countries. Below is a specification of the indicators used, their sources, and the rationale behind their selection.

Variables	Indicators	Source	Justification
Dependent variable	Employment in services (% of total employment)	International Labour Organization modelled estimates database.	Represents shifts in labor toward services as a result of offshoring.
Independent Variables	Exports in telecommunication, computer, and information services as % of GDP	UNCTADstat	Proxy for offshoring in the ICT sector.
	Inward FDI as % of GDP	UNCTADstat	Represents foreign involvement in the economy.
Control Variables	Frontier Tech Readiness Index	UNCTADstat	Measures countries' capabilities to adopt and benefit from digital services.
	Inflation, consumer prices	World Bank	Controls for macroeconomic volatility affecting labor markets.

Table 1: List of indicators to measure the impact of offshoring on Employment in services. Source: Author's conceptualization

Variables	Indicators	Source	Justification
Dependent variable	Net migration rate	World Bank	Represents the overall migration balance
Independent Variables	Exports in telecommunication, computer, and information services as % of GDP	UNCTADstat	Proxy for offshoring in the ICT sector
	Inward FDI as % of GDP	UNCTADstat	Represents foreign involvement in the economy.
Control Variables	Unemployment rate	ILOSDG Labour Market Indicators	Captures labor market pressures that may push emigration
	Real minimum wage[11]	ILOSDG and World Bank	Captures purchasing power and wage pressure on low-skilled labor
	Human Development Index	UNDP	Reflects development conditions

Table 2: List of indicators to measure the impact of offshoring on Net Migration Source: Author's conceptualization

Given the limited cross-sectional variation in the panel data, the appropriate regression model was determined by comparing a Fixed Effects panel regression with a Pooled Ordinary Least Squares model. To determine the most appropriate regression model for the panel data structure used in this study, we apply the Fixed Effects "Within" Estimator and conduct an F-test to assess the joint significance of the individual, cross-sectional effects. The F-test compares the restricted model, in this case the Pooled Ordinary Least Squares model without country-specific effects, to the unrestricted model, which includes country-specific Fixed Effects. The test assesses whether the unobserved heterogeneity across countries is jointly significant and should be controlled for. In RStudio, this is implemented using the *pFtest()* function from the *plm* package. The output, including the F-statistic, degrees of freedom, and the p-value, is reported below:

Model	Test	F Statistic	p-value
Employment outcomes	F test for individual effects (1, 22)	26.539	0.0000365
Migration outcomes	F test for individual effects (1, 21)	3.4394	0.07776

Table 3: F-test for individual effects results (Fixed Effects Vs Pooled OLS). Source: Author's calculation

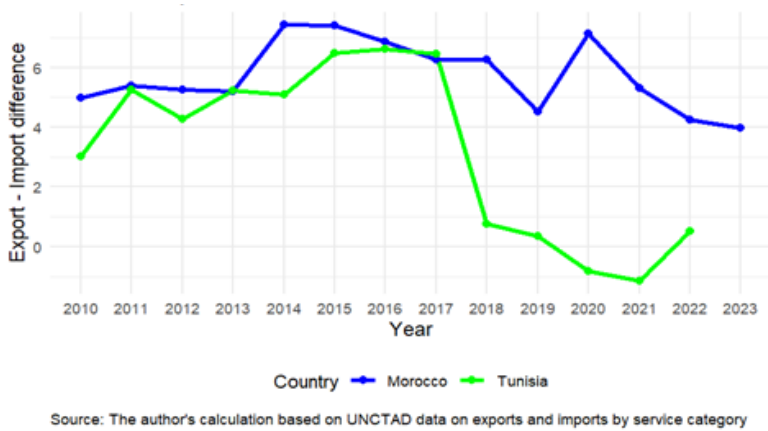
The very small p-value ($p < 0.05$) in the employment outcomes regression test leads to rejecting the hypothesis of no individual effects. That is to say that the test supports the use of a Fixed Effects model, as it indicates the presence of significant unobserved heterogeneity between the entities. However, in the migration-related test, the result of the test for individual effects ($p > 0.05$) seems to be marginally significant and does not reject the Pooled OLS model.

4. Results

Offshoring decisions are influenced by various factors, with cost-effectiveness being a central theme in much of the literature. In this regard, Tunisia and Morocco remain attractive destinations due to their relatively low labor costs, which enhance their comparative advantage, particularly when contrasted with other emerging offshoring hubs such as those in Central and Eastern Europe (Zoltán Gál, 2014). Labor costs appear to be higher in Morocco between 2010 and 2023. For instance, real minimum wage levels during this period were, on average, 53.41% lower in Tunisia than in Morocco.[5] Other factors also make offshoring activities attractive, such as the labor force. In fact, from 2010 to 2024, both countries experienced steady labor force growth, at 9.4% for Morocco and 9.72% for Tunisia.[6]

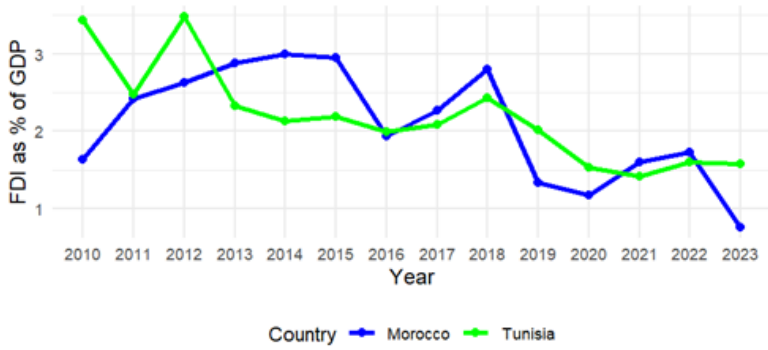
Both economies' focus on development has led to a prioritization of export-led growth and the enhancement of infrastructure for improved ICT adaptation and digital transitions. Figure 1 shows that exports of telecommunication, computer and information services exceed imports due to a positive balance in the ICT services trade. The difference between exports in ICT and imports in ICT, as a percentage of trade in services, has been positive from 2010 to 2023, with the exception of negative values for Tunisia between 2021 and 2022. Furthermore, Morocco has undertaken several strategic measures to foster digital transformation and encourage offshoring in the ICT sector. The establishment of key institutions like the Digital Development Agency and the National Commission for the Protection of Personal Data marks a strong commitment to enhancing the digital infrastructure and ensuring data security, especially with the establishment of national digital strategies, including the "*Maroc Numeric 2013*" and "*Maroc Digital 2020*" plans, aiming to position it as a leader in North Africa (MAA Fettouma, 2023). In Tunisia, similar policies have been taken. The ICT sector in Tunisia has experienced significant growth, fueled by the government's Smart Tunisia strategy, launched in 2015, and the National Strategy for Digital Transformation 2021-2025, both of which aim to drive IT innovation and tackle graduate unemployment. A prime example of this development is the Elgazala Technopark, the first dedicated technology park in Tunisia and the entire North African region. Remarkably, most of the park's production is exported, and it is home to several high-profile multinational corporations, including Alcatel, Ericsson, Huawei Technologies, STMicroelectronics, StoneSoft, and Kromberg Schubert (Ministry of Technologies and Communication of Tunisia, 2025).

Although there is no direct indicator of offshore intensity to Tunisia and Morocco, the growth in Telecommunications, computer and information services exports



Source: The author's calculation based on UNCTAD data on exports and imports by service category

Figure 1: ICT Services Export-Import Difference (% of Trade in Services)



Source: Author's calculation based on UNCTAD data on FDI and GDP

Figure 2: FDI as a Percentage of GDP in Tunisia and Morocco

indicates increasing demand for digitally deliverable services, often provided by offshore enterprises. As such, the upward trend in ICT-related service exports can be viewed as a proxy for the expansion of offshoring activities into the region. The increase in Inward investment goes hand in hand with the increase in ICT exports, showing the increasing relevance in international trade, as shown by Figure 2.

Despite the growth of ICT service exports and the positive evolution of inflows of FDI, high amounts of unemployment are present in both countries. Over the observed period from 2010 to 2024, Tunisia consistently exhibited a higher unemployment rate than Morocco, as indicated by a consistently positive difference between the unemployment rates in the two countries. On average, the unemployment rate in Tunisia exceeded Morocco's by 6%,[7] which signals structural labor market issues. In Tunisia, the real minimum wage is nearly twice as low as that in Morocco, being 53.41% lower.[8]

Demographic data indicate that both countries are primarily exporters of emigrants, with very high negative net migration rates. From 2010 to 2023, Tunisia experienced an average net migration rate of negative 62.28% relative to its combined migration rates.[9] This indicates the lower amount of emigration from Tunisia compared to Morocco, with the possibility of higher immigration inflows. On the other hand, between 2010 and 2023, Tunisia's Human Development Index was on average 9.38% higher than Morocco's, relative to their combined HDI levels,[10] reflecting relatively stronger performance in health, education, and income over time.

To assess the impact of offshoring on employment in services, a Fixed Effects Regression model was estimated using panel data for Morocco and Tunisia from 2010 to 2023, with the employment in services (% of total employment) being the dependent variable. The results, as shown in Table 4 below, using robust standard errors, indicate that ICT exports have a strong and statistically significant positive effect on employment in the services sector, suggesting that increased offshoring in the ICT sector is associated with higher service sector employment. Conversely, FDI inflows are negatively associated with service employment, potentially reflecting the importance of sectors other than services. The Frontier Technology Readiness Index also has a significant positive impact, implying that digital preparedness enhances labor absorption in services. Overall, the model explains 76% of the variation in service sector employment outcomes, supporting the hypothesis that digital offshoring and technological readiness are key drivers of service sector employment.

On the other hand, to assess the impact of offshoring and employment indicators on migration, a Pooled OLS model was applied for Tunisia and Morocco between 2010 and 2023, with the net migration rate as the dependent variable. The model

Variables	Coefficient	Robust Std. Error	t-value	Prob.
Exports in telecommunication, computer and information services as % of GDP	5.094	(0.594)	8.58	1.8e-08
Inward FDI as % of GDP	–1.062	(0.306)	–3.47	0.002
Frontier tech readiness index	17.988	(7.214)	2.49	0.020
Inflation	0.293	(0.006)	48.28	2.2e-16
Model Summary				
$R^2 = 0.808$	Adjusted $R^2 = 0.765$		F-ratio = 23.20	

Table 4: Fixed effects regression model results relative to employment in services. Source: Author's calculation

Variables	Coefficient	Robust Std. Error	t-value	Prob.
Exports in telecommunication, computer and information services as % of GDP	-0.34	18.82	-0.02	0.986
Inward FDI as % of GDP	-3.26	8.54	-0.38	0.708
Unemployment Rate	0.71	0.15	4.79	< 0.001
Real Minimum Wage	-0.06	0.07	-0.90	0.380
HDI	338.51	6.68	50.69	< 0.001
Model Summary				
$R^2 = 0.869$	Adjusted $R^2 = 0.765$		F-ratio = 19.97	

Table 5: Pooled OLS regression results relative to net migration rate.
Source: Author's calculation

explains approximately 76% of the variation in the net migration rate, supporting the significant impact of the Human Development Index on net migration rates. This indicates that improvements in development are strongly associated with more positive rates, which means less emigration. Exports in ICT-related services and unemployment, as well as real minimum wage, do not seem to have explanatory power in their relationship to net migration rates, indicating that migration decisions in this context are more sensitive to broader development indicators than to short-term economic or labor market factors, as shown in Table 5.

In conclusion, the models indicate that ICT offshoring, as proxied by exports of telecommunication, computer, and information services, has a positive and statistically significant impact on employment in services across both countries. This suggests that the increased integration of these countries in the global production chains in the ICT services sector is associated with job growth in services. In contrast, Migration appears to be more strongly influenced by other structural factors than ICT services trade, as there is no significant relationship between the offshoring proxy and net migration rates.

5. Discussion and contextual analysis

Since the mid-2010s, North African countries such as Morocco and Tunisia have increasingly repositioned themselves within a wider African and Euro-Mediterranean political economy. In recent years, both countries are "are increasingly turning

their attention towards sub-Saharan Africa", for security, migration and economic reasons (Dworkin, 2020). This shift reflects efforts to act as connective hubs between Europe and the African continent in the context of renewed industrial policy debates, nearshoring strategies, and the restructuring of global value chains following the COVID-19 pandemic. Within this context, the African Union has emerged as a key reference point for national development and industrial strategies, particularly through its Agenda 2063 and the Digital Transformation Strategy for Africa 2020–2030, which frame digitalization, industrialization, and skills development as central pillars of Africa's structural transformation (African Union, 2020). In parallel, the AU-EU partnership has prioritized digitalization, innovation, and infrastructure as areas of interregional cooperation, notably through the EU's Comprehensive Strategy with Africa (European Commission, 2020).

Within this evolving landscape, digitalization, particularly in relation to manufacturing, services, and knowledge-intensive activities, has emerged as a central axis for competitiveness and integration into regional and global value chains. While digital technologies can enhance productivity and facilitate the participation of firms from North Africa in European production networks, they also intensify competitive pressures and deepen skill selectivity within labor markets, potentially reinforcing differentiated mobility outcomes (Schwab, 2016; Tanchum, 2021). Importantly, although AU-EU digital cooperation initiatives acknowledge the transformative potential of the Fourth Industrial Revolution, the intersection between digitalization, industrial upgrading, and labor mobility remains underdeveloped at the intergovernmental level (EU-AU Digital Economy Task Force, 2019). Situating ICT offshoring within this regional African context thus highlights how national strategies in Morocco and Tunisia are embedded in broader continental ambitions to build regional value chains, while simultaneously shaping the conditions under which skilled labor is produced, retained, and channeled into transnational mobility circuits (Tanchum, 2021).

To fully interpret the empirical findings, it is crucial to contextualize them within the broader regulatory, policy, and socioeconomic environments of Morocco and Tunisia. The increasing tradability of services and the emergence of both countries as regional offshoring hubs underscore the importance of institutional frameworks in shaping these dynamics. Since gaining independence, both countries have pursued trade liberalization as a core economic strategy, aiming to integrate more deeply into the global economy. A pivotal moment in this trajectory was the signing of Association Agreements with the European Union, which facilitated greater economic cooperation and market access (Official Journal L 070, 2000; Official Journal L 97, 1998). Today, more than half of Morocco's and Tunisia's trade is conducted with the EU (European Commission, 2025). Both countries are aware of their roles in international production chains. They aim to enhance their attractiveness while achieving their development goals. To do this, they are establishing various criteria to regulate investment flows. These include identifying sectors of economic priority, ensuring job creation, and promoting equitable regional development (Morocco,

Investment Charter Law No. 03-22, 2022; Tunisia, Investment Law No. 2016-71). The legal definitions of investments, despite their focus on national development, seem to vary between the countries. For Morocco, there is a project- and production-centered perspective that focuses on the tangible conditions of goods or service production and job creation (Decree No. 2-23-1, 2023). The Tunisian legislator focuses more on border economic development, with the condition of risk assessment, and recognizes two forms of investment: direct and participatory investments (Law n° 2016-71, 2016). This suggests that, in the case of Tunisia, the legal framework permits a broader range of foreign investment, which can be either capital-intensive or labor-intensive in nature.

While digital technologies can enhance productivity and facilitate the participation of firms from North Africa in European production networks, they also intensify competitive pressures and deepen skill selectivity within labor markets, potentially reinforcing differentiated mobility outcomes.

Regarding investment tax incentives, both Tunisia and Morocco have established competitive fiscal frameworks aimed at attracting foreign and domestic investors, despite some divergence. Tunisia, pursuant to Tax Incentives Law No. 2017-8, provides a full exemption from corporate income tax on export-derived profits, in services and industry sectors, for the first year, followed by a graduated deduction thereafter, reaching 25% in the fourth year (Law n° 2017-8, 2017). Morocco, on the other hand, offers exporting companies, excluding those dealing in scrap metals, a preferential corporate income tax rate of 20% and can reach 10% when lower net profits are present. In addition, goods and services destined for export are fully exempt from value-added tax, with full deduction rights, provided that the export is substantiated through official documentation, such as transport receipts, customs declarations, and evidence of foreign currency payment. Besides, exporting companies in the Industrial Acceleration Zones benefit from a full CIT exemption for the first five years of operation, followed by a reduced fixed rate of 15% (Ministry of Economy and Finance and Administrative Reform, Morocco, 2021).

A preferential regime for enterprises operating in special zones is also present in Tunisia, as well as in economic activity parks. The regime offers full income and corporate tax deductions for export-related earnings for the first ten years of activity. Companies can also freely import production equipment, benefit from reduced VAT rates, and are allowed limited sales on the local market, with a maximum of 30% of their previous year's export turnover. Recruitment of foreigners in export companies is also exempt from common rules: companies can hire foreign managers or specialists without needing to follow the regular administrative authorization

procedure (Law No. 93-120, 1993). However, this does not include other regular foreign workers.

The existence of export-oriented regimes justifies the increase in exports in offshoring activities in both countries. However, the different approaches also highlight the possible variations, especially when it comes to the impact on the labor market and country competitiveness. For instance, sectoral differences in investment are a result of different focuses: Morocco focuses on practical job creation, while Tunisia focuses on broader economic development. The setting of economic priorities and equal development between regions further tightens both countries' position in the Global Value Chain, making them more attractive for offshoring in labor-intensive sectors such as textiles, manufacturing, and automobiles, rather than knowledge-intensive sectors. This implies, as also proven by the empirical data, a limited impact of offshoring in ICT services and inward direct investment on economic and employment indicators, despite their importance as a percentage of GDP.

The extensive tax incentives in both countries and the major focus on exportation can have a reverse effect of a race to the bottom, offering benefits for businesses to the detriment of others, and resulting in more informal employment Williams, 2015). For instance, labor markets in Tunisia and Morocco have high informal employment rates, especially in Tunisia. The causes of this phenomenon can vary due to local regulations and systems, but both countries struggle with poor access to credit and judicial inefficiencies, making it difficult for small firms to scale or integrate into formal value chains (Lopez-Acevedo, Ranzani, Sinha, & Elsheikhi, 2023). Therefore, other control factors, relative to labor market challenges and social security systems, indirectly impact the success of offshoring in these countries due to productivity and informality gaps. That is to say that offshoring can be more successful in comparative locations, such as Central and Eastern Europe, despite the lower labor costs in North Africa, due to these challenges.

While the impact of offshoring on employment is empirically supported and moderated by structural labor market challenges, the empirical analysis did not reveal a statistically significant relationship between offshoring and net migration rates. Instead, the findings align with existing literature that highlights the stronger influence of broader structural factors, unemployment, and economic opportunities on individuals' decisions to migrate in the cases of Tunisia and Morocco. To contextualize the impact of offshoring on migration, the country's migratory profiles also broaden the explanation of migration beyond mere economic activity.

Migration patterns in both Tunisia and Morocco are shaped by a complex interplay of economic, demographic, and historical factors, particularly in relation to their ties with European destination countries. In Tunisia, relatively high literacy rates and a larger pool of educated individuals have led to migration flows that are more strongly influenced by education-driven and skill-based incentives. In contrast, Moroccan migration tends to be more responsive to structural pressures, including high youth unemployment, rapid urban population growth, and broader demographic strain. As a result, while Tunisian migration is often characterized by a 'brain drain'

characteristic, Moroccan migration reflects more socioeconomic challenges (Gubert and Nordman, 2009).

However, more recently, both countries have become a transit destination for sub-Saharan migrants. These changes in migration patterns, coupled with the need for cooperation with the EU to limit irregular migration and to encourage development, have led to policy changes in both countries. In fact, migration and border management have become a means of conditionality in their partnerships with the EU. Transit migration has often been explained within the unintended policy impact of increasing EU policies. This means that, due to increasingly restrictive entry policies in Europe, countries in North Africa, particularly those in the Maghreb and Mashreq regions, have become de facto staging grounds for migrants hoping to cross into the European Union, largely because of their proximity (Sørensen, 2006). Other factors contributing to the persistence of challenges can also be rooted in national migrant integration policies and challenges to development, such as unemployment and poverty rates.

The main implication of these challenges is the encouragement of emigration as a means of development, through diaspora engagement policies. In fact, in Morocco, the diaspora has historically been seen as a development asset, leading to the creation of two main institutions in 1990: the Ministry in Charge of Moroccans Living Abroad and the Foundation for Moroccans Living Abroad. The first focused on monitoring migration, reintegration, and diplomacy, while the latter addressed cultural and educational matters. Relative to these institutions' approaches to diaspora is a homeland-centered rationality focusing on instrumental values of the diaspora-homeland tie, which can manifest mainly through remittances or investment (Mahieu, 2018). Following the same approach since 1998, Tunisia has consistently emphasized the importance of diaspora in skill development and economic growth through remittances and investment (IOM Tunisia, 2025). To further encourage this engagement, the Tunisian government has granted preferential fiscal treatment to Tunisians residing abroad who wish to create or participate in investment projects. This includes exemptions from import duties and taxes on equipment, materials, and one transport truck, whether imported or purchased from bonded warehouses. Additionally, purchases made in the local market from VAT-registered suppliers benefit from suspended VAT, consumption duties, and turnover taxes (Briki, 2022).

Concluding with the impact of offshoring activities in Tunisia and Morocco on migration, it is clear that while offshoring alone does not significantly drive migration trends, they are better understood through the lens of other labor market, demographic, and policy-related factors. While the impact of offshoring on employment and even FDI is more visible, it is also nuanced by control factors related to labor market conditions and policy incentives, allowing us to draw conclusions and implications for both employment and migration.

6. Conclusions

This study set out to examine the socioeconomic consequences of rising ICT offshoring intensity in Tunisia and Morocco, with particular attention to employment and migration trends. The findings indicate that offshoring produces selective and uneven socioeconomic effects: it generates sector-specific employment gains without broad labor market upgrading, while indirectly reinforcing skilled emigration rather than reducing it.

In regards to employment, the increase in service sector employment due to offshoring does not translate to a broad, generalized improvement in overall employment, largely because of challenges like informal unemployment and regulatory restrictions that limit the potential of the offshoring model. The confined role of both countries in labor-intensive sectors has kept them in lower positions within the Global Value Chain, preventing them from transitioning into knowledge-intensive industries, and cannot provide a solution for graduate unemployment, hence, for brain drain.

The limited impact of offshoring on migration is primarily driven by structural factors, as evidenced by the significant role of the Human Development Index in explaining migration trends, and by policy choices that promote emigration as a means of development. Both governments view emigration as an opportunity for economic growth through remittances and investment, with diaspora engagement policies actively encouraging the involvement of nationals abroad in the development of their home countries. In this context, ICT offshoring may indirectly reinforce migration by increasing the capabilities of skilled workers to access international labor markets, rather than anchoring them domestically. This dynamic challenges policy narratives that present offshoring as a straightforward "brain retention" mechanism.

These findings open several avenues for future research. First, there is a need for micro-level, qualitative investigation into the role of offshoring as a potential brain circulation accelerator. Longitudinal studies tracking the career trajectories of ICT graduates, particularly those who transition from domestic offshoring firms to international labor markets, would allow for a more precise assessment of how skills acquisition, professional networks, and income effects translate into migration capabilities. Second, further research should examine how national digital and ICT strategies in Morocco and Tunisia interact with continental frameworks, notably the African Union's Digital Transformation Strategy for Africa. Comparative analysis could assess whether current policies facilitate a diversification of partnerships toward intra-African digital trade and services, or whether they continue to reinforce EU-centred nearshoring models. Third, longitudinal and distributional analyses are needed to evaluate the long-term consequences of regulatory dualism between offshore and onshore regimes, particularly with regard to wage polarization, labor market segmentation, and the persistence of informal employment.

At the same time, the study highlights several structural obstacles and policy challenges. A central constraint remains the mismatch between the high-skilled

labor supply produced by national education systems and the relatively limited technological and functional upgrading of the offshoring in ICT sector. Without a transition toward more knowledge-intensive activities, offshoring risks reproducing a development model based on skill underutilization and outward mobility. In addition, the lack of coordination between economic policy, largely oriented toward attracting foreign direct investment, and migration policy, often centered on managing emigration and leveraging diaspora resources, creates internal inconsistencies. These policy domains frequently operate at cross-purposes, simultaneously fostering skill formation and facilitating the externalization of human capital. Finally, the continued over-reliance on the European Union as the primary economic and migration partner constrains the potential for deeper integration into African regional markets. Aligning offshoring and digitalization strategies with AU-level objectives would require a strategic shift toward South-South cooperation and the development of regional value chains in digital services.

Looking ahead, policymakers in Tunisia and Morocco may benefit from expanding offshoring strategies to include knowledge-intensive sectors, which could enhance their global competitiveness and generate higher-value employment opportunities. However, this is strongly related to the need for skill matching, thus, to training programs initiatives and human capital investment. Meanwhile, the problematic challenges faced in labor markets and migration management can be further addressed to prevent a race to the bottom by easing access to onshore sectors. In fact, to achieve a positive spillover effect from the offshoring regime, a more balanced approach seems necessary between highly incentivized offshore and onshore regimes. Ultimately, achieving the sustainable development that these countries aim for will require aligning labor market reforms, migration policies, and incentives for offshoring.

Notes

1 Data on the number of offshore enterprises in Tunisia from 2010 to 2022 was collected from the National Institute of Statistics of Tunisia (*Institut National de la Statistique*), under the section "Number of Enterprises by Regime: Offshore," available at: https://www.ins.tn/. The annual growth rate was calculated as the year-on-year percentage change in the number of offshore enterprises. The compound annual growth rate (CAGR) over the entire period was computed using the formula: $CAGR = (ending\ value / beginning\ value)^{1/n} - 1$ where the beginning value is 19,269 in 2010, the ending value is 34,317 in 2022, and n=12 years. This results in a CAGR of approximately 4.93%.

2 In this sense, 'labor rights' is used in a generic context, referring to the broader International Labor Standards as developed by the International Labour Organization. Central to these rights are the right to freedom of association and collective bargaining, the elimination of all forms of forced or compulsory labour, the elimination of discrimination in employment, and the right to a safe and healthy working environment.

3 Social dumping describes a situation where companies benefit from weaker labor protections or lower working standards in one country to outcompete others unfairly. It involves sidestepping fair employment practices to cut costs, gaining an advantage in the market by using cheaper labor without respecting proper social or labor norms. The Court of Justice of the EU

recognized in different cases potential situations of social dumping and prioritized the right of collective bargaining motivated by combating social dumping over the freedom of establishment and the freedom to provide services.

4 Outsourcing has become an essential business strategy in response to globalization and increasing market competition. Companies are constantly seeking ways to enhance efficiency, reduce costs, and adapt to rapidly evolving consumer demands. The growing complexity and expense of developing and managing information systems, coupled with the need for highly specialized skills, make outsourcing a practical solution. By delegating certain operations to third-party providers, especially in developing countries with abundant human capital, businesses can cut costs, accelerate project timelines, and focus on their core strengths. Globalization has also contributed to lowering barriers to international competition, leading to cost savings in production and distribution. This strategy not only reduces overhead costs but also allows businesses to diversify their product and service offerings, increasing flexibility in a competitive market.

5 Based on the author's calculation of percentage difference of real minimum wage of Tunisia compared to Morocco from 2010 - 2023. The average is the sum of the percentage difference divided by the number of years.

6 Labor force averages were calculated using yearly data from 2010 to 2024 for Morocco and Tunisia from the World Bank, World Development Indicators database.Annual growth rates were derived by calculating the year-over-year percentage change in the labor force for both countries.

7 Average unemployment difference calculated by the author from the difference between unemployment rates between Tunisia and Morocco based on ILOstat data for the selected period.

8 Based on the author's calculation of percentage difference of real minimum wage of Tunisia compared to Morocco from 2010 - 2023. The average is the sum of the percentage difference divided by the number of years.

9 Based on the author's calculation of difference percentages of net migration rate data of Tunisia opposed to Morocco, as collected from the World Bank database, from 2010 to 2023.

10 Based on the author's calculation of HDI difference percentage between Morocco and Tunisia from 2010-2023, based on data from UNDP.

11 Real minimum wage was calculated by the author through nominal minimum wage data collected from 2010 – 2023 for Tunisia and Morocco from ILOSTAT, adjusted to purchasing power. Purchasing power is represented by Inflation, consumer prices (annual %) data from the World Bank data portal for the same period. Real minimum wage = nominal minimum wage / (1+ inflation/100).

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