



SCHOOL OF ECONOMICS AND MANAGEMENT

Master Program in Economic Growth Population and Development

Development Assistance, and Employment Generation: The Case of Tunisia

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Abstract:

This study examines the link between official development assistance (ODA) and employment in Tunisia. It uses a vector autoregression (VAR) model to analyze aid inflows, their interaction with economic growth, investment, and education, and their effects on labor market outcomes. The study considers employment as a key development goal tied to economic growth, noting that it entered the global development agenda relatively late, with the adoption of the Sustainable Development Goals (SDGs). However, in Tunisia, employment has been part of development efforts and addressed by aid inflows since the 1990s. The results show that development assistance has not been effective in creating broad-based employment, possibly due to political and structural factors that have limited the potential impact of aid.

Keywords:

Development Assistance, Economic Growth, Employment Generation, Tunisia

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1. The Introduction

Official Development Assistance (ODA) refers to official financing provided with the primary goal of promoting the economic development and welfare of developing countries. It includes contributions from donor government agencies, at all levels, to developing countries (bilateral ODA) and to multilateral institutions (ESCWA, n.d). This assistance greatly influenced the development path of many countries after World War II and was often shaped by changes in development thinking (Kanbur, 2003). After the war, ODA focused mainly on economic growth. Later, poverty alleviation became a separate and primary goal. With the Millennium Development Goals (MDGs), human development emerged as an important priority for developed countries. This was later followed by the Sustainable Development Goals (SDGs), which offered a more comprehensive and inclusive framework for sustaining development for all. Unlike earlier development approaches, the SDGs also introduced employment as a key objective associated with inclusive economic growth (Hoeven, 2012).

Employment is a critical development goal because it is directly linked to economic growth and poverty reduction. Jobs provide income, improve living standards, and reduce inequality. They also contribute to social stability and help sustain long-term growth. However, because this is a relatively new objective in global development discourse, it has received little attention in the development assistance literature.

Tunisia presents an interesting case due to its transition economy status, structural reforms, and reliance on international aid. While aid's contribution to economic stabilization and social development is well documented, its influence on economic growth in general, and on job creation specifically remains under-researched. In Tunisia, employment had long been a key concern in development policy, even before its formal inclusion in the SDGs, reflecting its weight in the national economy and its importance for inclusive growth.

To explore this, I use a vector autoregression and structural vector autoregression to examine the relationship between ODA, and employment creation in Tunisia. My analysis covers the period between 1991 and 2022 and combines quantitative data with policy review. The main findings show that the effect of an inflow of development assistance has no significant effect on employment generation.

2. The Aim and Scope

This research aims to fill a critical gap in the literature by providing empirical evidence on the relationship between development aid and employment in Tunisia. While many studies have examined the impact of aid on economic growth, far fewer have focused on its direct and indirect effects on job creation. Tunisia has appeared in some studies as part of a broader regional analysis, but

it has not been the subject of a dedicated country-level study. Based on this gap, this study seeks to answer the following question: *Does development assistance contribute to employment creation in Tunisia?*

The scope of the research extends beyond measuring the size of the aid inflows. It examines the channels through which aid may affect employment, including public investment, economic growth and education levels. The study also considers the broader economic and political context that shapes how aid is allocated and used. In doing so, it contributes to both academic knowledge and policy debates on aid effectiveness, especially in tackling Tunisia's persistent labor market challenges.

3. Outline of the thesis

The thesis is divided as follows; the first section presents the context of the development assistance and employment nexus in Tunisia. The second section explores the theoretical framework and the methodology used to conduct our analysis. The final section presents and discusses our results.

4. Context:

The impact of foreign aid on economic indicators can be direct or indirect, depending on its goals and the way it is applied. Research has long examined the effectiveness of foreign development assistance in achieving development objectives such as fostering economic growth, reducing poverty, and improving human rights in recipient countries. However, despite this extensive attention, some areas remain less explored. For example, while several empirical studies have looked at the relationship between foreign aid and employment outcomes, this topic is still underdeveloped compared to the broader literature on aid and growth (UNU-WIDER, 2014). The limited interest in this link, and its relatively recent emergence, can be attributed to shifts in the development discourse over the past two decades.

Looking at the development goals, employment did not emerge as a development priority for the donor community until recently, with the adoption of the Sustainable Development Goals (SDGs). Under the Millennium Development Goals (MDGs), employment generation was initially absent as a development target and was only introduced in 2007 as a sub-goal, following broad discussions on its importance in the development process and in reducing poverty (Hoeven, 2012). This omission was partly due to the challenges of measuring employment outcomes, but over time it became evident that the MDGs could not be achieved without ensuring access to decent and fairly paid jobs. In fact, creating more and better jobs is one of the most effective ways to fight poverty, especially in countries where most people rely on work to support themselves (Khan, 2004). Therefore, labor-intensive growth is essential to achieving the first MDG, which is poverty reduction. Despite this fact, earlier development agendas did not focus on employment generation directly. Instead, they introduced short-term policies that mainly aimed at macroeconomic stabilization and better use of existing

production capacity (Hoeven, 2012). Likewise, early official development assistance (ODA) to developing economies rarely targeted employment generation as a central objective. It was often assumed that job creation would occur as a byproduct of increased private investment and economic growth and structural transformation. However, some aid tied to policy reforms, such as structural adjustment programs, even resulted in job losses, particularly in the public sector.

The SDGs mark a significant shift in development thinking and their treatment of employment. By explicitly recognizing employment as a central driver of development, goal 8 specifically aims to promote sustained economic growth, full employment, and decent work for all, the SDGs place employment at the intersection of economic growth and broader development objectives. Unlike the MDGs, where employment was primarily framed as part of poverty reduction objective only. This evolution in the development discourse underscores the direct link between development assistance and employment, acknowledging that creating more and better jobs is not only a means to improve individual livelihoods but also a keystone for achieving sustainable development.

While this shift reflects global priorities, in certain country-specific contexts donors were responsive to national needs and the recipient countries bargaining power. In some cases, including Tunisia, employment generation was incorporated into financing strategies well before it became a central element of the global development agenda. This responsiveness to domestic priorities shapes both the type of aid provided and the sectors it targets. The following section examines the employment landscape in Tunisia and places it within the broader development context to better understand how these global and local dynamics intersect.

a. Employment and Development Nexus the Case of Tunisia:

Since the 1960s, Tunisia has received Official Development Assistance (ODA) to support its development plans aiming to boost economic growth and address social challenges. When we look at the total ODA given to North African countries (see Figure 1), Tunisia ranks third after Egypt and Morocco. However, the picture changes when we look at net ODA per capita, specifically after 2000. During this period, Tunisia received more aid per person than both Egypt and Morocco, and the trend continued to rise (see figure 2).

Understanding the context under which the aid is disbursed explains better this trend. In 1986, Tunisia underwent a stabilization and structural reforms supported by the IMF and the World Bank (Harrigan, 2011). The reform was planned on the span of 20 years and included policies targeting market liberalization and establishing a strong private sector (Harrigan et al., 2009). During the second phase of the structural Adjustment Program (SAP), Tunisia has also adopted the association agreement in 1995 with the European Union, marking a step further in the country's efforts to liberalize its market. The free trade agreement has brought Tunisia substantial industrial and financial support from the

European Union (EU) and the African Development Bank (AFD). This support aimed to enhance the competitiveness of Tunisian firms and implement the country's industrial policy through the *Programme de Mise à Niveau (PMV)* (Ghali & Mohnen, 2004; Harrigan, 2011). Between **1990 and 2002**, we notice a slight increase in multilateral funds followed by a decrease in bilateral funds, which aligns with the implemented programs (see figure 3).

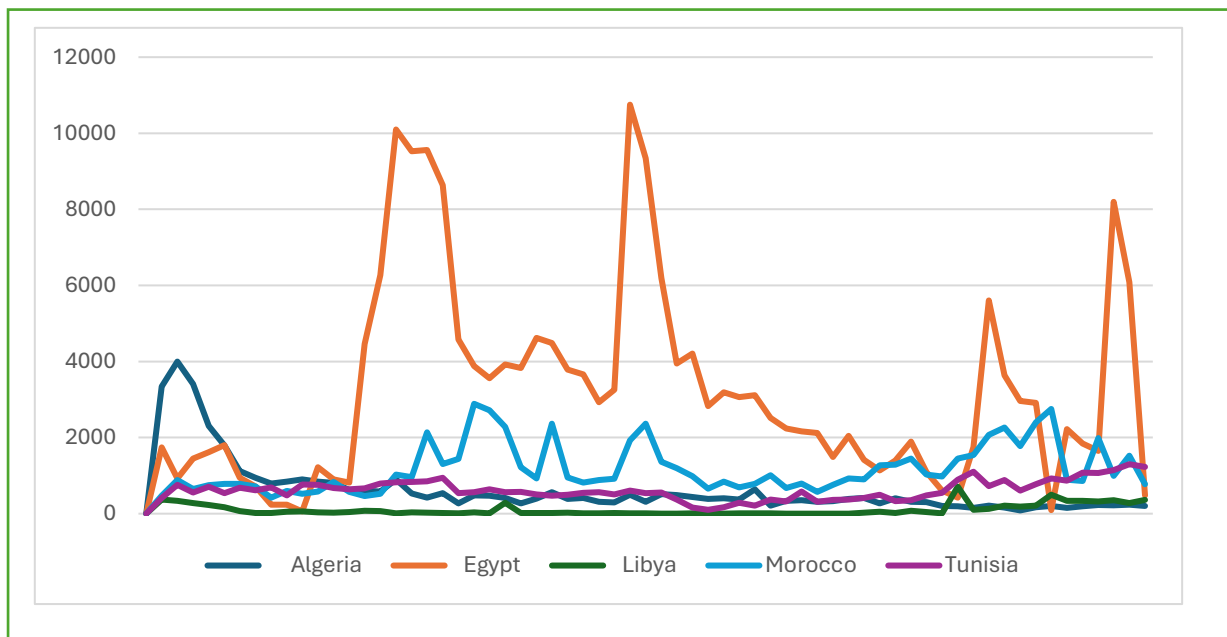


Figure 1 Aid (ODA) disbursements to countries and regions 1960-2023, Current USD, OECD (2025)

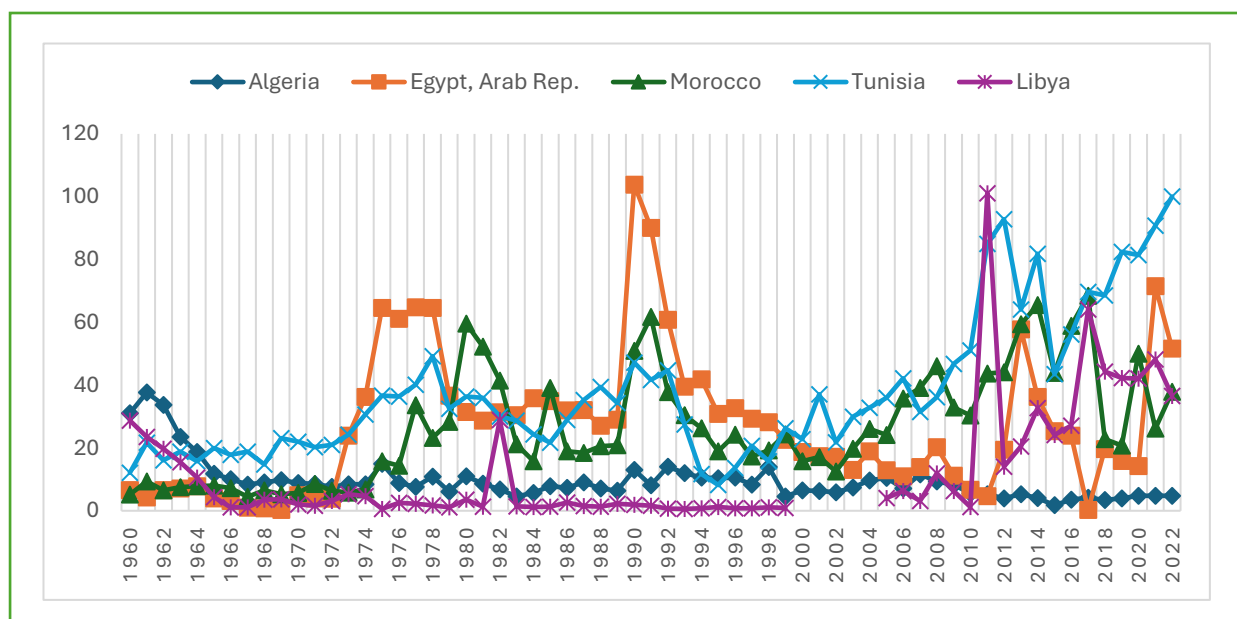


Figure 2: Net ODA received per capita (current US\$), 1960-2022, World Bank (2025)

The trend reappeared after 2010, driven by the Arab Spring and the overthrow of the Ben Ali regime. In the years following the revolution, foreign aid increased sharply. The first wave came from multilateral donors, partly linked to the conditions of the new IMF loan signed in 2013. This was followed by a rise in aid from bilateral donors. The post-2010 surge reflected a development agenda focused on supporting the democratic transition, reducing regional inequalities, and meeting growing social demands, particularly those related to youth employment and inclusion (Burwell et al., 2016).

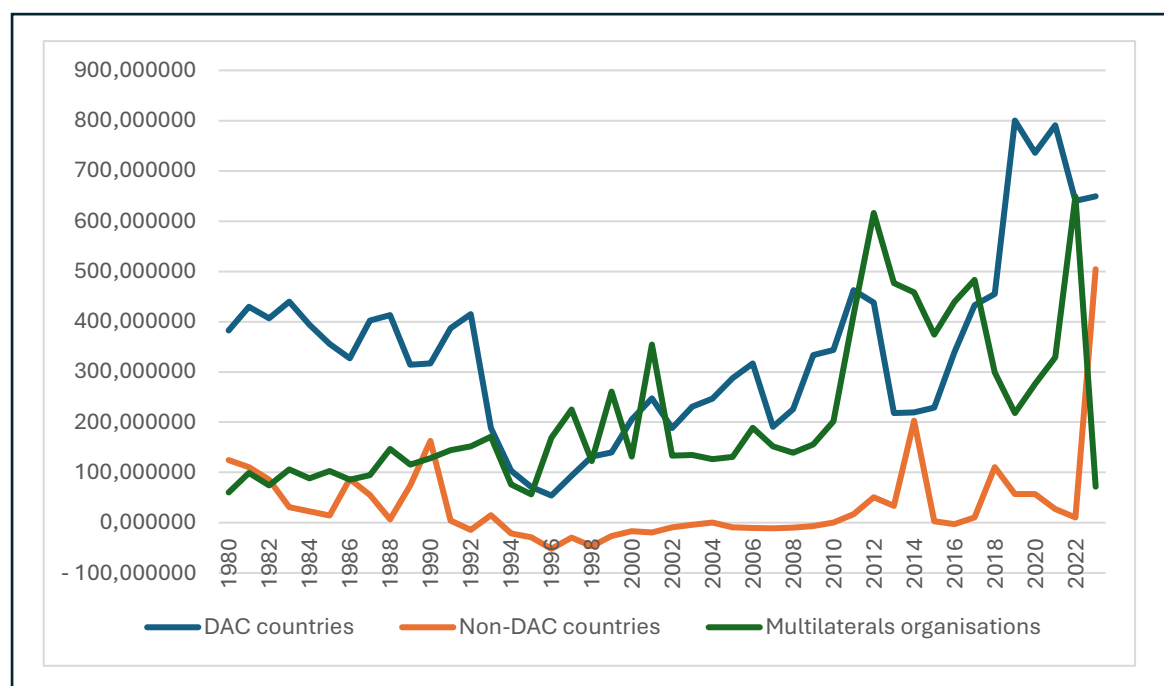


Figure 3: Aid Flow to Tunisia per Type of Donor 1980-2023, OCDE 2025

i. Employment Landscape:

While employment emerges as a key objective of development assistance post 2011, it was not absent from the agenda in the previous period. In fact, employment generation has been a persistent challenge for Tunisian policy makers since its independence. Despite the different developmental policies that have been implemented including active labor market policies, significant improvements in employment indicators remained elusive.

Compared to neighboring economies in Africa and the broader MENA region, Tunisia's unemployment rate remains one of the highest, exceeding 16% in 2024. Moreover, the employment-

to-population ratio has consistently remained below 42% over the past 33 years, which is significantly lower than the average of 57.5%¹ observed in lower middle-income countries.

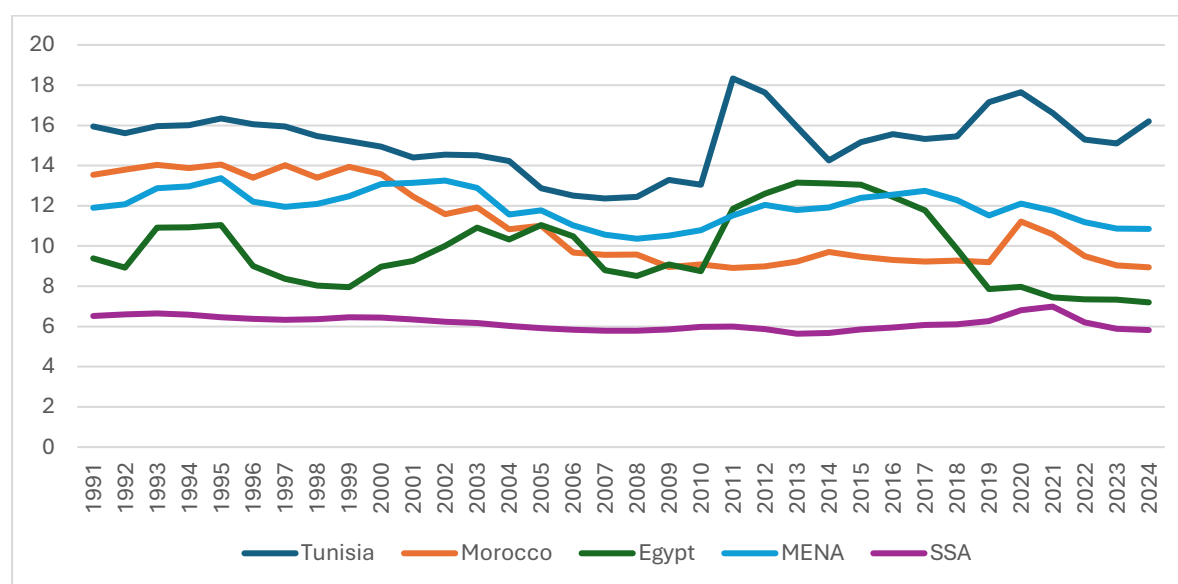


Figure 4: Total Unemployment % of total Labor Force (modeled ILO estimate), Extracted from the World Bank Database

As depicted in figure 5, before the 1990s population grew steadily and never went below 2%. This trend disappeared starting in the 1990s. Despite a noticeable slowdown in demographic growth since the mid-1990s, with the population growth reaching its lowest in 2022 (0.58%), the active population continues to increase, and pressure on the labor market persists, mainly affecting the younger generation. In figure 6, we see the distribution of unemployment among the different age groups between 2005 and 2023. It shows that the age group most affected by unemployment are the ones under the age of 35. Additionally, since 2005 the share of unemployment for this group has continued to increase, rather than decrease.

¹ Author's own calculation based on the world bank dataset on Employment to population ratio, 15+, total (%) (modeled ILO estimate)

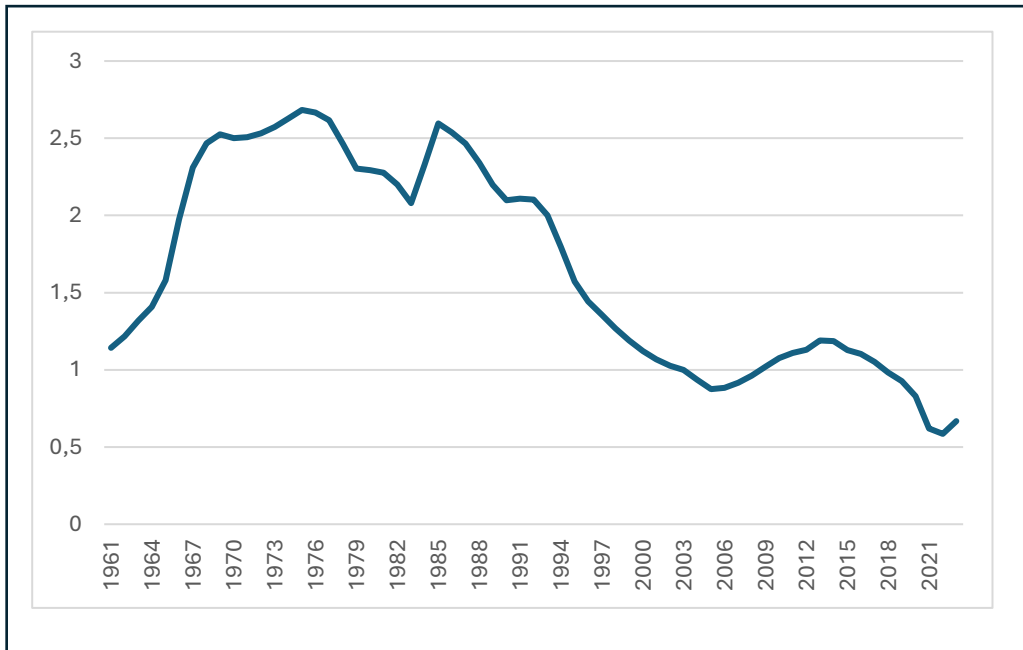


Figure 5: Population growth (annual %) Tunisia, World Bank Data

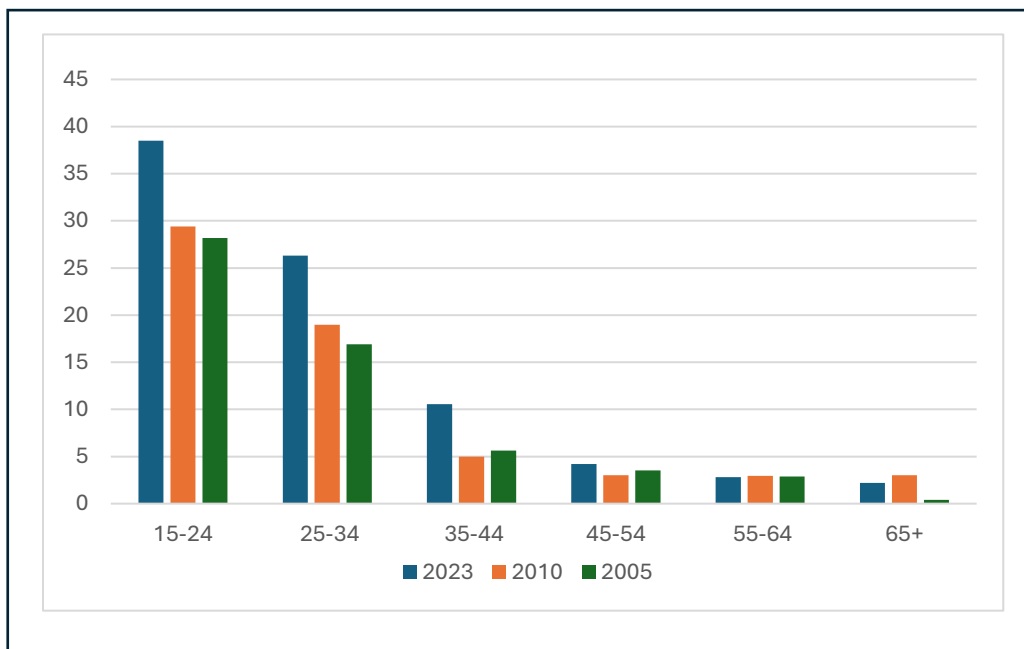


Figure 6: Unemployment share by age group, ILOSTAT

Beyond the quantitative aspect of unemployment, a new qualitative dimension emerged during the 1980s, in which a growing share of the unemployed were in fact secondary and tertiary-levels degree holders (Ben Amor, 2011). Their share of the working age population has almost quadrupled since the 1990s, and in 2023, it has reached 23.6% (Grundke & Cassimon, 2022; INS, 2023). category of jobseekers falls within the age group most affected by unemployment. This is explained by the mismatch between the job supply and the job demand. The private sector has mainly created jobs in low-skill-intensive and low-productivity activities, while the largest unemployment share is in the category of high-skilled labor, making it impossible to absorb the flow of new graduates specifically at the tertiary level (Ben Amor, 2011; Grundke & Cassimon, 2022).

Employment remains heavily concentrated in a few sectors, with services absorbing the largest share of the labor force, followed by manufacturing and agriculture. In 2022, nearly 50% of total employment was in services, 33% in industry, and about 12% in agriculture (INS, 2023). This sectoral distribution has remained largely unchanged over the past decade. Between 1990 and 2012, a limited structural transformation occurred: agriculture's share fell from 21% in 1991 to 13% in 2023, while manufacturing fluctuated between 31% and 35% (World Bank, 2025). Services grew from 45% in 1991 to 54% in 2023. However, as Ghazali & Mouelhi (2018) note, the most productive sectors are not those generating the most jobs; employment growth has been highest in low-productivity sectors, limiting the labor market's capacity to absorb skilled workers.

ii. Development Assistance and Employment

The persistence of unemployment, along with its social and economic impacts, has made it both a development priority and a constant concern for Tunisian policymakers, since the 1980s.

The Structural Adjustment Programs (SAPs) and the Programme de Mise à Niveau (PMN) marked an era of reforms. Although both programs were designed with broad developmental goals, employment remained a key concern within these reforms. Policymakers recognized both the existing mismatch between labor supply and demand and the potential gap that could arise from the new industrial policy promoted under these programs. Tunisian policymakers sought to address unemployment not only by increasing the immediate use of existing productive capacity but also by expanding the economy's long-term capacity to create jobs. These efforts were closely linked to the industrial policy being implemented at the time, which aimed at emerging industries to absorb the growing labour supply. To facilitate this, the government introduced a fiscal package that included tax exemptions for export-oriented industries, reductions in employer contributions to the social security fund, and wage subsidies. These short-term measures were designed to stimulate job creation quickly, particularly among young people with varying skill and education levels (Ben Amor, 2011).

At the same time, longer-term strategies focused on structural changes to increase the economy's ability to create jobs. These included improving vocational training, raising educational outcomes, expanding infrastructure, and strengthening social security systems. Policymakers saw a constant mismatch between the needs of the labor market and the skills of jobseekers. This was partly due to a rigid education and training system, shown in high school dropout rates and many students leaving programs before completion (Ibid, 2011). To address this, a major education reform was launched in 1989, aimed at aligning education with the evolving needs of the economy. While there is no direct evidence linking immediate employment interventions to ODA, Tunisia did benefit from World Bank support for structural ones. According to Harrigan et al. (2009), the World Bank financed several investment loans to improve the quality and relevance of education at all levels: primary (1989, 2000), secondary (1994, 2004), and tertiary (1990, 1992, 1998, 2000). These reforms formed part of a broader development vision in which industrial policy and human capital investment were expected to work together to reduce unemployment over time. Additionally, the European Parliament (2016) reports that Tunisia received 330 million euros in aid under the European Neighborhood Program (ENP) between 2007 and 2010 part of this amount, 66 million euros (20%), were aimed at improving graduate employability. This program clearly targeted a key policy concern for Tunisia while the previous programs (1995-2006) focused rather on more broad objectives such as: Macroeconomic support and institutional governance economic cooperation and private sector, social cooperation, and rural development and environment.

The effectiveness of development assistance during that period remains debated. While the macroeconomic indicators were stabilized in the first period of the program, decreasing unemployment and enhancing private investment did not meet their planned outcomes (Blin, 2009). The unemployment rate between 2004 and 2010 has an average of 12.9% which is 2% lower than the previous decade. Nonetheless it remains higher than the MENA region's average and the average in neighboring economies. It is believed that unemployment combined by the autocratic corrupt system, and the social and economic hardship post the 2008 financial crisis were the fuel for the revolution in 2011, which held the slogan of "Employment, Freedom, and National Dignity".

The post revolution aid inflows were accompanied by a different development discourse. Unlike the pre-2011 era, where aid was often tied to macroeconomic stabilization or sector-specific reforms, post-revolution aid adopted less technical wording and aimed mainly to support the democratic transition and the rising social demand, advancing the youth as a key target in general and placing employment within the discourse. Nonetheless, many argue that these policies in practice did not shift much from the previous neoliberal rhetoric (Hanieh, 2015; Hecan, 2016). The IMF and World Bank specifically continued to promote similar policies in Tunisia, but after the 2011 Arab uprisings, there were also clear changes in how they spoke about their role and how the local political situation influenced their involvement. According to Hanieh, (2015) the World Bank's Interim Strategy Note

(ISN) for Tunisia focused on three main goals: (1) promoting sustainable growth and job creation, (2) supporting social and economic inclusion, and (3) improving governance through voice, transparency, and accountability. However, in practice, the Bank pushed for policies like labor market deregulation and encouraged privatization and public-private partnerships (PPPs) in sectors such as infrastructure, wastewater, and water supply. The World Bank orientations include job creation as a pivotal objective of their intervention and link it to sustained economic growth. Their study on employment in Tunisia published in 2014, targets the policies hindering the evolution of the labor market, in which they highlight the structural problems such as the rigidity of the labor code, the distortion of public sector wages, the weak active labor programs, the poor business environment and the underutilization of the human capital stock. The policy recommendation, thus, focused on reforming the business environment principally to allow the private sector to flourish. This included reviewing: (1) the competition code, (2) the wages in the public sector and limiting the distortion it causes for the private sector, and (3) the social security scheme.

Figure 3 shows that multilateral donors have dominated the assistance inflow in Tunisia in the first decade after the revolution. In figure 7, however, we observe that European institutions represent the largest multilateral donor.

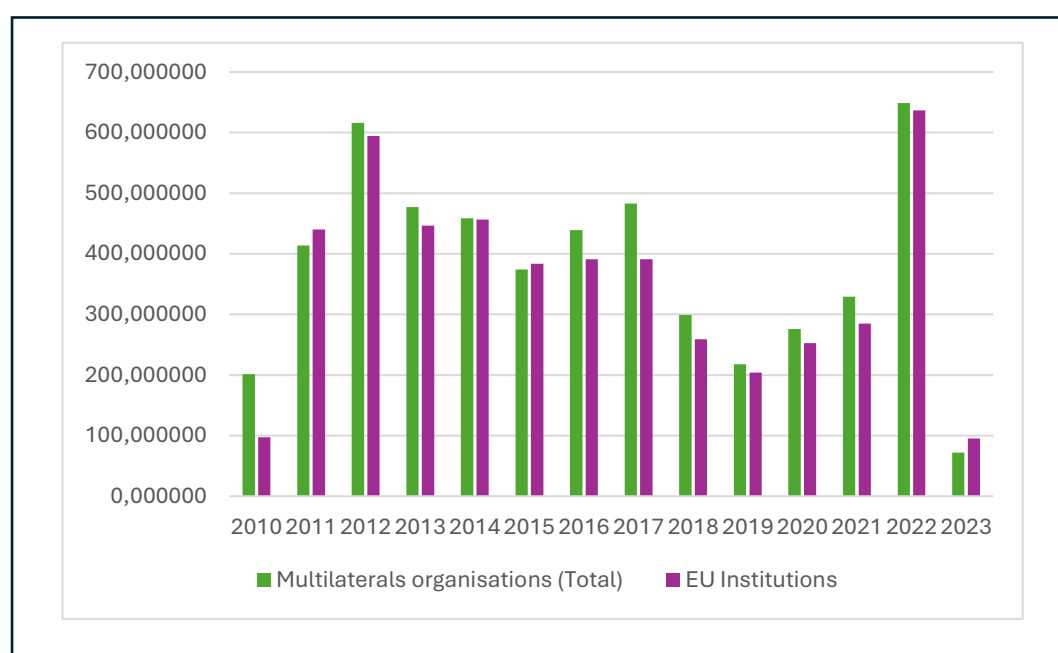


Figure 7: Multilateral Aid Disbursed to Tunisia 2010-2023, OCDE (2025)

The disbursed aid coming from the European side is covered by the European Neighborhood Program. Between 2010 and 2013 assistance was covered by the Spring Program and focused primarily on employment and social protection, business competitiveness (industry and services), democratic transformation and institution, building sustainable and inclusive growth and economic

development. While employment is still presented as a core theme of EU assistance in Tunisia, its share is considerably low compared to the 2010-2013 period (20% vs 9%) (European Parliament, 2016). On the other hand, business competitiveness was allocated 56% of the total disbursed assistance (Ibid, 2016). From the Tunisian side, the employment policy for the period 2013-2017, has anticipated 700,000 TND in public expenditure on employment, which is 3 times the allocated budget in the 9th plan (see table 1). In terms of objectives the new plan posits on promoting small businesses, improving vocational training systems, and developing the skills needed in sectors facing labor shortages, reducing the unemployment rate and establishing employment programs and improving productivity levels. Such objectives are aligned with the policy recommendations of the World Bank as well as the budget distribution of the European Institutions highlighting the link between development assistance and employment in Tunisia.

While in many countries the link between development assistance and employment only gained prominence with the adoption of the Sustainable Development Goals, in Tunisia it was recognized and actively pursued much earlier. Both donors and Tunisian authorities saw job creation as a key objective, integrating it into broader economic reforms, industrial policy, and human capital investment. Despite this shared focus, employment was still treated as a secondary by-product of growth on some occasions and not as a priority in its own right, shaping the design and implementation of several aid-supported programs.

Table 1 Public expenditure on employment, source: Bel Haj Amor 2011

	9th Plan (1997–2001) in Million Dinars		10th Plan (2002–2006) IN Million Dinars	
	Budget Allocations	In %	Budget Allocations	In %
Public Employment and Administration Services	73.83	4.30	114.35	4.87
Employment Training	43.90	2.56	106.83	4.55
Targeted Measures / Youth	476.97	27.79	995.35	42.36
Subsidized Jobs and Job Creation	1121.44	65.35	1104.72	47.01
Unallocated FNE (<i>National Employment Fund</i>)	0.00	0.00	28.75	1.22
Total	1716.14	100.00	2350.00	100.00

Building on this context, the following section examines how scholars have approached the relationship between foreign aid and employment. It explores both the theoretical foundations and the empirical evidence, highlighting where consensus exists, where findings diverge, and how Tunisia's experience fits into the broader debate

5. Theory and Previous Research:

a. Literature Review:

This study focuses on how foreign aid affects employment in recipient countries. In the literature, employment is seen both as a tool of reducing poverty and as an outcome of economic growth. When viewed as an outcome, employment is often linked to structural transformation and increased economic activity (Page & Shimeles, 2015; UNU-WIDER, 2014). This follows the idea from Lewis' model, where labor moves from low-productivity sectors to high-productivity ones, emphasizing the importance of labor market flexibility, infrastructure investment, and industrialization in creating jobs in developing countries (Chatterjee & Turnovsky, 2007; Estache et al., 2013; Lavopa & Szirmai, 2012). To improve labor market outcomes when foreign aid is present, it is important to first understand how aid affects economic growth and then how this growth influences employment in different sectors.

Looking at the literature on the effect of foreign development assistance in Tunisia, there are few studies that focus directly on the country. Most research examines this relationship within a regional framework, either as part of Africa or as part of the MENA region. Teboul and Moustier (2001) and Sabra & Eltalla, (2016) found that aid inflows were associated with negative growth in several MENA countries. In North Africa, aid initially increased domestic investment, but the impact turned negative in the medium and long term, possibly due to crowding out of other investments or overconcentration in low-productivity sectors. However, these studies used aggregate data, making it hard to identify the effects by sector. Studies that use disaggregated aid data give a clearer picture, since aid is often directed to certain sectors with the goal of boosting growth and improving livelihoods through better activity in those areas. Aljonaïd et al., (2022) argue that the overall effect of aid on growth is weakened because different sectors respond to aid in different ways. They analyzed data from over 30 countries in Sub-Saharan Africa, the MENA region, and Southeast Asia between 1996 and 2017. Using both aid commitments and disbursements, and applying a GMM method, they found important differences across sectors. When aid was committed to support industrial growth, the results showed positive and significant effects. However, when looking at actual aid disbursements, the effects were not significant. This suggests that while aid promises may seem helpful, the money that arrives may not have a strong impact on industry. In the service sector, both commitment and disbursement data showed negative effects. While in the agricultural sector, they were positive. The different results per sector were explained by different control variables mainly in relation to financial market maturity and efficiency as well as other institutional and geographical indicators.

These studies focused mainly on economic growth and sectorial growth, but not on the association between economic growth, development assistance and employment. Nchofoung et al., (2022)

investigated this association in the African context. Their findings suggest that assistance aid negatively and significantly affects employment in recipient African countries. This effect, however, is nuanced once it is explored across sectors and across regions. In Northern and Eastern Africa, aid inflows have a negative and significant effect on employment rates, while in central and in Western Africa, the effect is positive and non-significant. The authors find that foreign aid has a positive effect on agricultural employment across all sub-regions, but this effect is only statistically significant in East Africa. For service sector employment, the effect is negative and significant in East Africa but positive and significant in North Africa. In contrast, the impact on industrial employment is negative and significant in Eastern, Northern, and Southern Africa.

In country specific cases, different outcomes are reported. In Nigeria, for example, the trend aligns with the regional findings: an increase in total aid reduces employment, which challenges the common belief that aid promotes job creation. In the short run, a rise in aid slightly lowers employment, while a drop in aid leads to a small increase (Asaleye et al., 2023). In contrast, the case of Pakistan shows an opposite outcome. There, foreign aid and employment levels are positively and significantly linked, meaning that aid has helped generate employment (Tanveer et al., 2019). Page and Shimeles, (2015) have found that Between 2000 and 2009, the African countries that received the highest levels of aid relative to their GDP were often those with the lowest employment elasticity to growth; implying that donors may not have prioritized countries effective at creating jobs, or that their aid programs failed to generate employment, or possibly both.

The studies also explored how foreign aid affects employment controlling other factors like education, foreign direct investment, exchange rates and trade openness, etc. These macroeconomic indicators often influence employment levels. Therefore, their interaction with development assistance inflow can indirectly affect employment.

Looking first into the human capital and employment nexus, Ernst and Berg (2015) describe this as a "virtuous circle" where education and health improve employment and growth. As the economy grows and productivity rises, poor people earn more, invest more in education, health, and infrastructure, and this cycle supports further growth. On the other hand, Ranis and Zhao (2013) argue that human development, especially education, drives better economic performance, especially when combined with technology. Nchofoung et al. (2022) measured human capital using years of schooling and returns to education. Their results show a negative and significant effect of human capital on total employment in North Africa. Anyanwu, (2013) using the primary school enrolment ratio, as a proxy for human capital, also found a negative and significant link between human capital and youth employment in North Africa. These results go against the general trend in Africa, where both studies found that human capital usually has a positive effect on total employment and probably reflects the region's high unemployment rates.

Development assistance often goes hand-in-hand with efforts to leverage FDI for job creation. Donor-funded programs, such as aid for infrastructure, workforce training, or investment climate reforms, are designed to attract and maximize the benefits of FDI. Research in sub-Saharan Africa finds that official development aid can complement national efforts by drawing in more FDI, especially when aid is used to build productive infrastructure (Paulin et al., 2025). According to the OECD (2024), In Tunisia, foreign-owned firms are few but significant: as of 2022 only 3.5% of Tunisian private companies had foreign ownership, yet these firms accounted for 21% of formal private-sector jobs. However, whether foreign direct inflows are employment generation remains dependent on the type of sector they invest in. Back to domestic investment, it is the primary engine of job creation in most economies. Almoula-Dhanoon et al (2020) found that increases in domestic investments in the MENA region are associated with a decrease in unemployment rate, which reflects more job creation.

The reviewed literature shows that while there is growing interest in the relationship between development assistance and employment, this nexus remains less explored than the broader aid–growth debate. It also highlights that studies focusing on Tunisia only are scarce. Building on these insights, the next section will present the theoretical framework guiding this study. It draws from employment/growth theories, and development economics, to explain how development assistance can influence employment through various channels, and their applicability in the Tunisian context.

b. Theoretical Framework:

The previous sections have explored the link between aid, economic growth and employment. Considering the novelty of this nexus, there's no theory to directly link development aid to employment generation. It is possible, however, to explore this nexus through investigating the theories that explore economic development and employment and how they relate with development assistance.

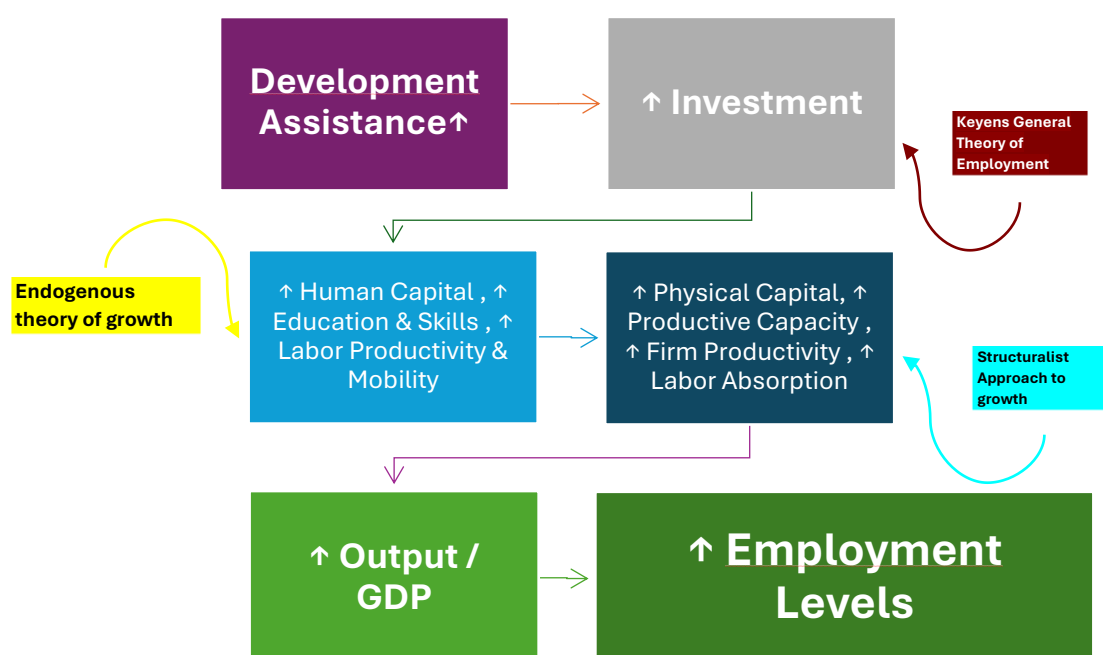
The association between economic growth and employment can be best captured by John Maynard Keynes' general theory of Employment (1936). The theory introduces equilibrium employment, which is the level of employment at which businesses neither increase nor decrease their workforce. This posits on effective demand, in which a higher level of demand for goods and services drives firms to produce and hire workers, which according to Keynes, is the primary determinant of employment, output, and economic growth. This theory links employment and production in circular process, where total income increases, incentivizes people to spend more (consumption), and saves the rest. Since people don't spend all additional income, businesses can't sell all the extra products solely by relying on consumer demand, calling for more investment such as machinery, infrastructure, and equipment, rather than immediate consumption. The equilibrium, however, doesn't imply the absence of unemployment from the economy. Since employment is dependent on consumption and investment, a market characterized by low demand will generate an equilibrium dependent on its level

of output. For this reason, Keynes argues that government's intervention to stimulate both consumption and investment is crucial to escape ineffective equilibrium. This is by (1) stimulating investment through methods such as public works projects, managing monetary conditions, specifically interest rates to encourage private investment, and (2) generating demand through methods that might seem "wasteful" in case practical or politically acceptable options are unavailable. From this perspective then, development assistance that targets public expenditure such as social programs and infrastructure building can therefore raise aggregate demand and increase employment in the short run.

Development assistance can also influence employment levels through structural transformation. Structuralist development economics emphasizes that developing countries often suffer from structural challenges such as technological gaps, and underdeveloped industrial bases, which constrains their growth and job creation (Dutt, 2019). According to this perspective, there are two structuralist approaches to development theories that illustrate the employment aid nexus. The first one is the Domar-Harrod model, which was the basic theoretical approach under which aid was disbursed after World War two (Krueger, 1986). This model advances investment as a catalyzer for shifting the production structure and enhancing economic growth. In this model, development assistance intervenes as a gap filler with the investment ratio needed in recipient economies to launch a structural shift and enhance their productive capacities. While this model focuses on increasing output through increased investment/savings and capital accumulation, it neglects the labor component. Lewis' dual sector model, however, complements this approach by addressing the effect of structural transformation on labor surplus that many developing economies face. According to this model traditional sectors hold a reservoir of "surplus labor" working at very low productivity. The modern sector, mainly industry, can create more jobs without increasing wages. It uses the surplus labor until it is used up. The structural approach explains the link between development and employment from the supply side. It focuses on increasing the recipient country's investment capacity, which helps shift the production structure toward higher productivity sectors. This shift creates more opportunities for labor absorption.

While investing in physical capital is undeniably important for generating growth, development theories specifically the endogenous growth theories argue that economic growth is facilitated from within the system and depend largely on a country's human capital stock and technological capacities. Lucas, (1988) argued that endogenous factors, mainly, schooling and knowledge enhancement have a long run effect on economic productivity. This theory holds that policy choices and investments can permanently raise the growth rate by improving the quality of input from within the economy. Based on this theory knowledge acquisition and generation have increasing returns. Therefore, factors affecting investment in a country's learning capacities and knowledge production systematically affect its production capacities, the same way physical capital does.

Following the structuralist approach to development, Keynesian general theory of employment, and the endogenous growth theory, development assistance is an exogenous demand stimulus that can improve employment both in the short run and in the long run. This works through consumption, investment, and public expenditure channels, which are subject to multiplier effects. So, if development assistance is used to support investment, it can quickly create jobs, for example in construction. These workers then spend their earnings, which helps create even more jobs in shops and services. This follows the idea in Keynesian economics: when government spending increases, it can boost the economy by more than the amount spent, thanks to the multiplier effect. Simultaneously, when development assistance finances public investment in infrastructure (roads, ports, power, digital connectivity, education/ knowledge enhancement) and establishing a modern sector, it can reduce costs for businesses and encourage the growth of manufacturing and high-value services that create formal jobs. The figure below better captures the growth, employment and development assistance Nexus.



The association so far is very theoretical; however, it is observable in practice. In the case of Tunisia, in the background section it was already established that Tunisia's labor market is characterized by the mismatch between supply and demand of labor. This means that many people who are ready to work can't find jobs because there isn't enough demand in the economy. Belgacem and Vacher (2023) show that unemployment in Tunisia reacts strongly to changes in economic growth. In fact, the link between GDP growth and falling unemployment under the Okun law is about 69% stronger in Tunisia than in similar middle-income countries. This means that when the economy grows, unemployment drops more than usual. These findings advance that employment generation is highly linked with economic growth in Tunisia. In this case and following the Keynesian theory of employment, any intervention

that can boost economic growth can generate employment, meaning if development assistance increases investment, allowing for more demand, hence more output, this increase will result in more jobs in the short run.

Simultaneously if development assistance finances structural interventions aiming to transform the productive structure of the economy (including Human capital formation), therefore employment indicators are expected to move upward with improved productivity. In the 1990's Tunisia, heavy investments were deployed to put in place the structural adjustment program and put in action Tunisia's industrial policy. The investment made focused mainly on improving public infrastructure and strengthening both the physical and human capital of the country (Ghali & Mohnen, 2004; Harrigan, 2011). Therefore, following Lewis' double sector model, the industrial policy targeted increasing demand and supply of labor in highly productive sectors, which are expected to create jobs directly by employing people in newly established and the improved companies, and indirectly through links with local suppliers and service providers. Based on this we therefore expect the following:

- **H1: Development assistance has a positive and statistically significant effect on employment generation through its impact on aggregate demand.**
 - **H1a: Development assistance has a positive and statistically significant effect on economic growth and investment levels**
 - **H1b: Economic Growth and investments have a positive and statistically significant effect on the employment levels**

In the following section, we will empirically test the identified hypothesis per our theoretical framework. We will first present the data and methodologies to be used for this purpose and later present the results and discuss them.

6. Data

In order to empirically investigate the effect of development assistance on employment generation, we first explore the determinants of employment as highlighted in our theoretical framework first and later based on the specific case of Tunisia. The analysis relies primarily on secondary, macro-level data drawn from international databases and national sources. The covered period depends on the availability of our primary data as well as on the contextual specificities that reflect dynamics across economic and labor market dimensions in Tunisia. The timeframe of our study spans from 1991 to 2022. This period encompasses key macroeconomic events such as the implementation of structural adjustment programs, post- adjustment aid cycles, and industrial policy shifts, the Tunisian revolution and the shift in assistance discourse.

Following on the steps of Nchofoung et al., (2022) and (Asaleye et al., 2023) the core dataset for this study includes Official Development Assistance (ODA). Specifically, the Total ODA disbursed to Tunisia for the period between 1991 and 2022. In this study, we use both total ODA disbursements and disaggregated ODA by donor type. The literature shows that multilateral aid to Tunisia during the study period aimed to support: (1) improving human capital by reforming the education system, and (2) increasing capital inflows and technology transfer through industrial policy. In particular, European multilateral aid explicitly included employment generation as one of its main objectives. It also supported employment indirectly by aiming to boost economic growth. Based on this, it is relevant to examine the effect of multilateral aid on employment generation and not only focus on total aid.

The annual figures for assistance disbursed are retrieved from the OECD database. These data were disaggregated by donor category and included only official donors². As for the aggregated assistance data, it was also retrieved from the OECD database. All ODA variables (aggregate and disaggregate) were divided by the total population each year.

The second core dataset for this study is employment data. The data used includes employment to population ratios and sectoral employment data. For the sectoral employment data, we only focus on employment in industry and services. In the background section, the aid disbursed to Tunisia after the 1990's was aiming to transform the productivity structure in the economy pushing for the establishment of a Tunisian Industry. Therefore, using sectorial employment data could capture if the disbursed assistance successfully achieved its target. The main source of the data is the World Bank database, supplemented by ILOSTAT indicators.

The theoretical framework on which we are basing our analysis offers a set of control variables which possibly affect employment levels in a given economy. Starting with the macroeconomic indicators, in the Keynesian model as much as in the structuralist approach, employment is expected to be affected by output growth in general through increased public spending, specifically increased investment. As a proxy for investment we follow the steps of Nchofoung et al., (2022) and use Gross capital formation, but instead of using the fixed value of it, we opt for the values as a percentage of GDP as it reflects investment effort relative to the economy's size.

Moving to the last indicator we will be exploring the ones relevant to the endogenous growth theory, specifically Human capital indicators. To capture the quality of the labor force, this study includes a proxy for human capital which is school enrolment rates for secondary level. Ben Amor (2011) highlights the rigidity of Tunisia's education and training systems before the 1990s, a rigidity often reflected in the high number of secondary school dropouts, which further deepened the unemployment

² Official donors include: (1) Multilateral Organizations, including EU institutions the WB and the IMF, (2) DAC countries and (3) Non-DAC countries.

crisis. To address this issue, a reform supported by the World Bank was introduced, initially aiming to reduce dropout rates and improve the absorption of graduates into the labor market. In this context, it would be relevant to investigate the relationship between secondary school enrollment and employment outcomes.

The source of the macroeconomic indicators, namely: real GDP growth, gross capital formation, enrolment rate and investment are drawn from the World Bank's World Development Indicators (WDI) datasets and the OECD datasets. The data used in this study were collected from internationally recognized and publicly available sources. These sources provide consistent and standardized data that ensure comparability across time. The chosen indicators are commonly used in empirical literature and are considered reliable for assessing macro-level relationships. Overall, the dataset is representative of key variables relevant to the study's objectives. The table below summarizes the data that will be used in the study, and their source.

Table 2 Data Sources and Description

Variable Name	Source
Employment-to-population ratio (% of total population ages 15+)	WDI ³
Employment in industry (% of total employment)	WDI
Employment in services (% of total employment)	WDI
Net official development (% GNI)	OCDE
Development Assistance Disbursed DAC countries	OCDE
Development Assistance Disbursed Multilateral Agencies	OCDE
GDP per capita growth (annual %)	WDI
Gross capital formation (% of GDP)	WDI
School enrolment, tertiary (% gross)	WDI

7. Methodology

The empirical analysis in this study uses the Vector Autoregressive Model (VAR) and its extension Structural Vector Autoregressive Model (SVAR). Initially, the purpose of VAR is to study the relationship between multiple time-series variables, where all variables are treated as possibly influencing each other. This means that each variable is explained by its own past values and the past

³ World Development Indicators

values of the other variables (Stock & Watson, 2001). In simple terms, a VAR regresses several time-series variables on their own past values and on the past values of the other variables. This shows how variables interact over time without making strong assumptions about which variables are causes and which are effects. This is particularly relevant and useful for studying complex systems where variables can influence each other in both directions.

The SVAR is an important version of the VAR model. It adds theory-based restrictions to help identify meaningful economic shocks (Fernández-Villaverde & Rubio-Ramírez, 2016). In a standard VAR, the error terms are mixtures of different shocks, so it is hard to tell what effect one shock has. The SVAR model solves this by adding extra assumptions, such as setting some effects to zero or choosing an order for the variables. This helps us identify specific shocks, like for instance an aid shock.

The Rationale for Using VAR and SVAR to analyze the aid employment nexus in Tunisia, rely on the complex interdependencies of our variables as explained by the theoretical framework, and the previous research that have implemented this methodology.

In our theoretical framework the link between our variable of interest appears to be complex and interdependent. For instance, it is expected that an increase in public expenditure through assistance inflow is expected to increase investment than output and hence employment level. This association can also be bi-directional, meaning that the country's economic performance (GDP) or labor market dynamics could also influence the amount of aid it attracts and the investment level attributed. Therefore, by applying a VAR model the interdependencies among all the variables of interest are captured without needing to designate one variable strictly as the dependent variable. However, in our model we also assume that development assistance is an exogenous stimulus that affects the variable of interest both directly and indirectly, specifically the employment level. As highlighted in the framework, employment rate is the last variable of interest expected to be affected by the foreign development assistance after a serial of changes on other macroeconomic variables. In this case, applying a structural VAR is more suitable to capture the effects of an increase or decrease in development assistance on the behavior of the other variables.

A review of existing studies that have implemented the VAR and SVAR models supports our choice of methodology and highlights its relevance to the topic and variables under study. For example, Pasara & Garidzirai, (2020) investigated the relationship between unemployment, economic growth and gross capital formation in South Africa. Using a VAR model they have found that gross capital formation positively improved economic growth. VAR based analysis was also used for studies on foreign development assistance and growth. Sijabat, (2022) applied a VAR model in investigation the relationship between GDP, ODA, FDI, and gross capital formation. Their methodology was used in the sense that first covers cover the feedback loops between the variables and then the causal pathways.

The SVAR approach is also widely used in macroeconomic studies. It is mostly used to identify contemporaneous relationships and isolate specific shock effects within an endogenous system. SVAR models are often used in policy analysis to assess external shocks such as the introduction of a new policy and its effect on economic dynamics over time (Ghanem & Smith, 2022). For instance, Anetor (2020) examined the economic growth effect of foreign capital inflows, including ODA and financial development in the Nigerian economy. For this, an SVAR was applied, in which the author controlled for the shock effect on the dynamic between the different variables. Similarly, Lim & Liu, (2024) have also applied a panel SVAR to investigate the relationship between official development assistance (ODA) and investment, covering Africa, Latin America-Caribbean, South/Southeast Asia.

The approach adopted in the mentioned research along with our theoretical framework therefore justifies using a VAR/SVAR in the thesis, as it aligns with both literature's best practices and the theoretical need to treat our key macro variables as a jointly determined system rather than in isolation.

Model Specification

Our empirical model is a five-variable VAR focusing on Tunisia. For the reduced form VAR, it takes the following form:

$$X_t = v + A_1 X_{t-1} + \dots + A_6 X_{t-5} + u_t$$

Where X_t represents the vector of endogenous variables. v is a vector of intercepts and A_p is the coefficient matrix per lag and u_t is the white noise.

In the case of SVAR, the following equation will be used to conduct our model:

$$X_t = v + A_1 X_{t-1} + \dots + A_6 X_{t-5} + B^{-1} \varepsilon_t$$

Where B^{-1} is the contemporaneous impact matrix and ε_t are structural shock.

The estimation procedure follows the steps highlighted in Pasara & Garidzirai (2020), Anetor (2020), (Sijabat, 2022) and Lim & Liu (2024). The first step is the stationarity test. In which we begin by examining the time-series properties of each variable to determine whether they are stationary or contain unit roots. Using tests like the Augmented Dickey-Fuller (ADF) and Phillips-Perron, we test the null hypothesis of a unit root for each series. This step is crucial because VAR models require careful handling of non-stationary data to avoid spurious regression results.

The second step is Lag Order Selection. In this step we identify the optimal lag length for the VAR. for which we use information criteria like AIC and SBIC as quantitative guides. With stationarity addressed and lag length fixed, we estimate the VAR model. Diagnostic Checks: After fitting the VAR, it is essential to verify that the model is well specified. We perform a series of diagnostic checks, mainly stability test, residual autocorrelation and residual normality and heteroskedasticity ⁴. The first test calculates the eigenvalues of the var companion matrix to ensure they all lie inside the unit circle. as for the residual autocorrelation it checks for serial correlation in the var residuals. No serial correlation means the var has captured the time-dependence in the data well. Lastly, checking for the residual normality and heteroskedasticity. Ivanov & Kilian (2005) and Lütkepohl (2005) highlights that normality is not a strict requirement for VAR estimates to be consistent, as moderate deviations are common in economic data, so it is a secondary check.

8. Results

Following the estimation process highlighted in the methodology section, we first start with a unit root test for all our variables. Two tests are used in order to ensure the stationarity of our data which are the Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) test. Table 3 below presents the tests results.

As illustrated, the results report the same level of integration for all the variables across the two tests, except for school enrollment. In the ADF test, this variable appears trend-stationary at the 5% level. However, the PP test shows it is non-stationary. Because these results differ and it is our only such case, we further test for the school enrolment series using the Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test. The results of the test indicate that series is weakly stationary. These results align with the ADF ones. To avoid over differencing, specifically in our case where the number of observations is limited, we proceed with the non- differenced values of the series in conducting the VAR model.

For the other variables, namely: employment in services, gross capital formation, and bilateral ODA disbursements, that are also non-stationary, we use their first differences. This ensures all variables are stationary in the VAR model. This method aligns with standard rules of thumb discussed in scientific sources and forums and highlighted by (Cromwell & Hannen, 1993).

⁴ [PowerPoint Presentation](#) and [tsvarstable.pdf](#)

Table 3: Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) test

	At Level		At first Difference		Order of Integration
Variable	Intercept	Trend+ Intercept	Intercept	Trend+ Intercept	
Employment to Population Ratio	-2.621***	-3.651**	–	–	I (0)
Employment in Industry	-1.771**	-4.650***	–	–	I (0)
Employment in Services	0.251	-2.635	-6.092***	-6.075***	I (1)
School enrolment	-1.826	-2.160**			I (0)
ODA (% GNI)	-2.266 **	-3.521**			I (0)
GDP per Capita	-4.983***	-4.563***			I (0)
Gross Capital Formation	-1.540 *	-2. 776	-6.098***	-5.971***	I (1)
ODA Multilateral Donor (Per Capita)	-2.490***	-3.601**			I (0)
ODA Bilateral (Per Capita)	-1.538 *	-3.078	-4.051***	-4.167**	I (1)
The Phillips-Perron (PP) Test					
	At Level		At first Difference		Order of Integration
Variable	Intercept	Trend+ Intercept	Intercept	Trend+ Intercept	
Employment to Population Ratio	-2.492	--3.534 **	–	–	I (0)
Employment in Industry	-1.647	-4.479***	–	–	I (0)
Employment in Services	0.343	-2.635	-6.348***	-6.279***	I (1)
School enrolment	-2.428	-1.741	-5.263***	-5.959***	I (1)
ODA (% GNI)	-2.414	-3.553 **			I (0)
GDP per Capita	-5.021***	-5.943***			I (0)
Gross Capital Formation	-1.540 *	-2. 776	-6.648***	-6.519***	I (1)
ODA Multilateral Donor (Per Capita)	-2.431	-3.553 **			I (0)
ODA Bilateral (Perc Capita)	-1.942	-3.093	-4.078 ***	-4.222 **	I (1)

After differencing the non-stationary series at level, we proceed with running our VAR model, using annual data from 1992 to 2022. The first model will explore **the relationship between GDP, ODA, total employment, schooling level, and gross capital formation.**

As a first step, we choose the lag order. The selection criteria offer two optimal lag orders, 1 and 4 as indicated in table 4. Following the recommendations of Ivanov & Kilian (2005) and Lütkepohl (2005), we choose the criteria with the smallest lag order. In this case the Schwarz Bayesian

Information Criterion (SBIC). This criterion is preferred considering its suitability with small sample sizes like ours.

Table 4 Lag Order Selection Criteria Model 1

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-52.3251				0.000041	4.09465	4.16738	4.33254
1	21.3802	147.41	25	0.000	1.3e-06	0.615699	1.05206	2.04306*
2	40.0167	37.273	25	0.054	2.5e-06	1.07023	1.87022	3.68706
3	74.4478	68.862	25	0.000	2.2e-06	0.396589	1.56021	4.20289
4	137.747	126.6	25	0.000	6.2e-07*	-2.33905**	-0.811789*	2.65672

Table 1 in Appendix A presents the detailed results of the first VAR model, while Tables 2, 3, and 4 in the same appendix report the results of the diagnostic tests. The model's residuals are normally distributed, free from skewness, and do not exhibit heteroskedasticity. The Lagrange Multiplier (LM) test further indicates that the residuals are free from autocorrelation. Given these diagnostic results, we can confidently proceed with the analysis.

Focusing first on the two main variables of interest of this study, we investigate the tables in which employment is the dependent variable and the one in which ODA is the dependent variable. Starting with the first, the results of the VAR model indicate that employment levels in Tunisia are negatively affected by official development assistance. However, the coefficient is not significant.

In the case where ODA is the dependent variable, it seems that increases in employment levels attract more development assistance, but once again this link is non-significant. These findings suggest that there's no direct link between employment and ODA as highlighted in our theoretical framework. In fact, none of the other explanatory variables (growth, investment or school enrollment levels) have a statistically significant impact on ODA. This may imply that ODA allocation is not strongly driven by changes in these domestic economic indicators in the short run, or that its variation is driven by external or political factors.

Since our theoretical framework is interested in short-run indirect link between employment, official development and other macro-economic indicators, it is interesting to investigate how these variables respond to ODA and to one another.

Looking at GDP growth, we see that a 1-point increase in employment to population ratio in the previous year is associated with a 3.03 percentage point decrease in GDP growth. This is surprising

and counterintuitive. Based on the general theory of employment and the structural approach to development, an increased GDP is expected to be associated with increased employment level. Therefore, an increase in employment levels is expected to be associated with a positive effect on GDP. These findings can reflect structural labor issues like low productivity jobs or underemployment. This explanation is supported by Table 1.4, which shows that an increase in the employment-to-population ratio is associated with a 0.091-point drop in GCF. This finding reinforces the idea of low-productivity employment and a lack of structural transformation. It also aligns with the findings of Ghazali & Mouelhi, (2018) in which at aggregate levels, employment elasticity significantly decreased over time reaching 0.48 between 2000 and 2012. This decline suggests that economic growth in Tunisia has become less dependent on labor supply in high productive sectors. Their findings also suggest that sectors demonstrating increased employment-growth elasticity are often those with the lowest productivity such as agriculture and fishing, non-manufacturing, construction, trade and tourism, while highly productive sectors show a decrease in employment intensity.

Similar study by Goaied & Sassi, (2015) that have investigated the effect of the 1995 free trade agreement with the European union, on employment generation confirm Ghazali and Mouelhi's finding and conclude that the liberalization post the agreement did not enhance employment level. The export-driven sectors often targeted by the agreement had little effect on employment generation as most investments were capital-intensive. Considering that the free trade agreement was linked with an increased inflow of ODA aiming to enhance the productive capacities of Tunisian companies, we would expect it to positively effects GDP growth and gross capital investment regardless from the non-significant results we found for employment levels. However, table 1.3 and table 1.4 show that ODA has a consistently negative and statistically significant effect on both GDP growth and investment. This follows the regional trend identified by Teboul and Moustier (2001) and Sabra & Eltalla, (2016) in the MENA region in general and the North Africa region specifically highlighting aid ineffectiveness. However, from our theoretical standpoint, the stimulus of ODA was expected to increase both GDP and investment. Yet, in this model it is the reverse effect and therefore it would logically result in a decrease in employment levels, which follows the coefficient sign (-0.282), presented in table 1.4 despite the non-significance.

The VAR model used so far focuses only on the aggregate effect of foreign development assistance on other macroeconomic variables. However, some studies suggest that this aggregate view may overlook important details. For example, over the 30-year period studied, official development assistance came from two main sources: bilateral and multilateral donors. The pattern of inflows varied across time. In some years, multilateral aid dominated, while in others, bilateral aid was more significant. This uneven distribution by donor type may have different impacts on economic development and job creation, specifically if the different motives of each donor group are taken into

consideration. Multilateral aid is often seen as less influenced by political or strategic interests, unlike bilateral aid, and is therefore expected to be more effective in promoting economic growth. Therefore, we conduct a second VAR model in which our variable of interest responds to multilateral aid and third model in which our variable of interest responds to bilateral aid. Table 6 in Appendix A summarizes the results of the multilateral assistance model, while Tables 7, 8, and 9 present the diagnostic test results. The model's residuals are normally distributed, free from skewness, but show weak heteroskedasticity. The Lagrange Multiplier (LM) test indicates no autocorrelation in the residuals.

Table 10 in Appendix A summarizes the results of the bilateral assistance model, and Tables 11, 12, and 13 present the corresponding diagnostic tests. In this case, the residuals are not normally distributed, are free from skewness, and also exhibit weak heteroskedasticity. The LM test again shows no autocorrelation in the residuals. Since normality is of secondary importance in our analysis, we proceed with the interpretation of the results.

In the multilateral model, ODA and employment levels both have a negative and significant effect on GDP growth and investment levels. These results are consistent with the findings of the first model. In the bilateral model, ODA also has a negative effect on these macroeconomic indicators, but the effect is not statistically significant.

The employment results in these two models provide more insights than in the first model. Multilateral assistance has a positive effect on employment, while bilateral assistance has a negative effect. In both cases, the effects are not statistically significant. However, when examining how ODA responds to employment levels, we find that bilateral donors respond positively and significantly to changes in employment.

While Biscaye et al., (2017) conclude that there's no consistent empirical evidence that either bilateral or multilateral aid is more effective overall at achieving development outcomes, Berthélemy, (2006) finds that bilateral donor are not altruistic and actually motivated by political and economic interests. Combining this with the general view that multilateral aid is less guided by strategic or self-interested objectives, we might interpret the different coefficient signs as multilateral aid have better effect on employment than bilateral donors despite their positive and significant responsiveness to improved employment levels. However, since our results are not significant for the multilateral model, we can only speculate it's the case.

School enrollment, as a human capital proxy, shows similar results across the three models (aggregate ODA, Bilateral ODA and Multilateral ODA) with some discrepancies. In the bilateral ODA model, school enrollment negatively affects investment levels and economic growth both at the 10% level and 5% level respectively. The table also shows that bilateral donors respond positively and

significantly to improved education indicators. A larger share of school enrollment at the secondary level is associated with increases in aid flow by 1.1 points.

Similar results are observed when development aid is disbursed by multilateral donors, specifically in regard to economic growth and investment levels. When it comes to this group of donors' responsiveness to improved education indicators, the coefficient has a positive sign but not significant. Employment on the other hand is significantly and negatively affected by the school enrollment level unlike the previous two models. Having a negative effect of school enrollment both on economic growth, investment and employment is expected in the case of Tunisia. These findings does not only align with the regional trend highlighted by Nchofoung et al. (2022) and Anyanwu, (2013), but are also expected in the Tunisian context. The increase in employment concentrated in low-productivity, non-tradable sectors require predominantly low-skilled labor. This structural pattern limits the economy's ability to absorb additional skilled labor, as the sectors capable of employing such workers remain underdeveloped. Without parallel expansion of high-productivity, skill-intensive industries, an increase in skilled labor supply risks exacerbating underemployment and skill mismatches, rather than alleviating the employment challenge. While the mismatch between the labor supply and demand is often attributed to the large number of tertiary graduates, these results hint that the gap also include semi-skilled labor with secondary degrees.

The results so far highlight the interaction between official development assistance, employment levels, GDP and Investment. However, it does not investigate the effect of aid shock on employment and the other explanatory variables. To explore this relationship, we use a Structural Vector Autoregression (SVAR) model with a recursive Cholesky decomposition. This method involves placing the variables in a specific order, where each variable can have an immediate effect on those that follow, but not on those that come before.

The SVAR model allows us to control the structural effects of ODA on key macroeconomic variables, including gross capital formation, education, economic growth, and employment. The choice of ordering is based on economic logic and our theoretical framework. Compared to a regular VAR model, the SVAR provides a better fit for our objective, as it helps identify the structural impact of aid on employment and other outcomes. The Cholesky decomposition order we have adopted aligns with the theoretical framework, and it provides with the effect of an aid shock in the short and medium run. It is as follows:

1. ODA is exogenous: we assume that it is determined by donor countries and international agreements. And it contemporaneously affects all domestic variables, especially investment, economic growth and employment, following Keynes general theory of employment.

2. Education: is influenced contemporaneously only by ODA: since education is policy-driven and slow to respond to macroeconomic fluctuations in the short run. And in our model, it represents the endogenous capital the country already has and its influence.
3. Gross Capital Formation responds to ODA as sources of investment financing and education as an available human resource. Not to employment or GDP contemporaneously.
4. GDP per capita responds contemporaneously to all the above variables reflecting the aggregate outcome of investment, aid, and education. But not to employment
5. Employment is the most endogenous variable in our framework and responds to all variables.

Four SVAR models are conducted:

1. The first tests the effect of a total aid shock on employment in general.
2. The second focuses a multilateral aid shock on employment.
3. The third focuses a multilateral aid shock on employment.
4. The fourth tests the effect of a total aid shock on employment per sector (employment in industry / in services).

Later we proceed with the Impulse Response Function (IRFs) for All SVAR models. This function helps us illustrate both the short-run and long-run effects, offering a comprehensive view of the relationship between the aid shocks and the variables within the system. According to Ghanem & Smith, (2022) IRFS within an SVAR model captures the dynamic causal effect of a shock on each of the variables in the model over time. Before presenting the results, it is important to note that the SVAR model does not include bilateral assistance. This is because the VAR model for bilateral assistance showed non-normality in its residuals, and IRFs are sensitive to this issue. Therefore, we exclude it from the analysis.

Figure 8 shows the IRF results for model 1 (ODA, schooling level, investment, GDP, and total employment). The graphs illustrate the effect of a one-unit aid shock on employment, GDP, investment, and education over an eight-year period. The shock initially has a negative impact on employment, investment, and GDP, but this effect begins to turn positive by the third year. The immediate impact of the aid shock is consistent with our VAR model results, where the effect is significant for GDP and investment but not for employment. However, the positive effects observed after the third year are not statistically significant, as the estimated responses fluctuate around zero and remain within the 95% confidence bands.

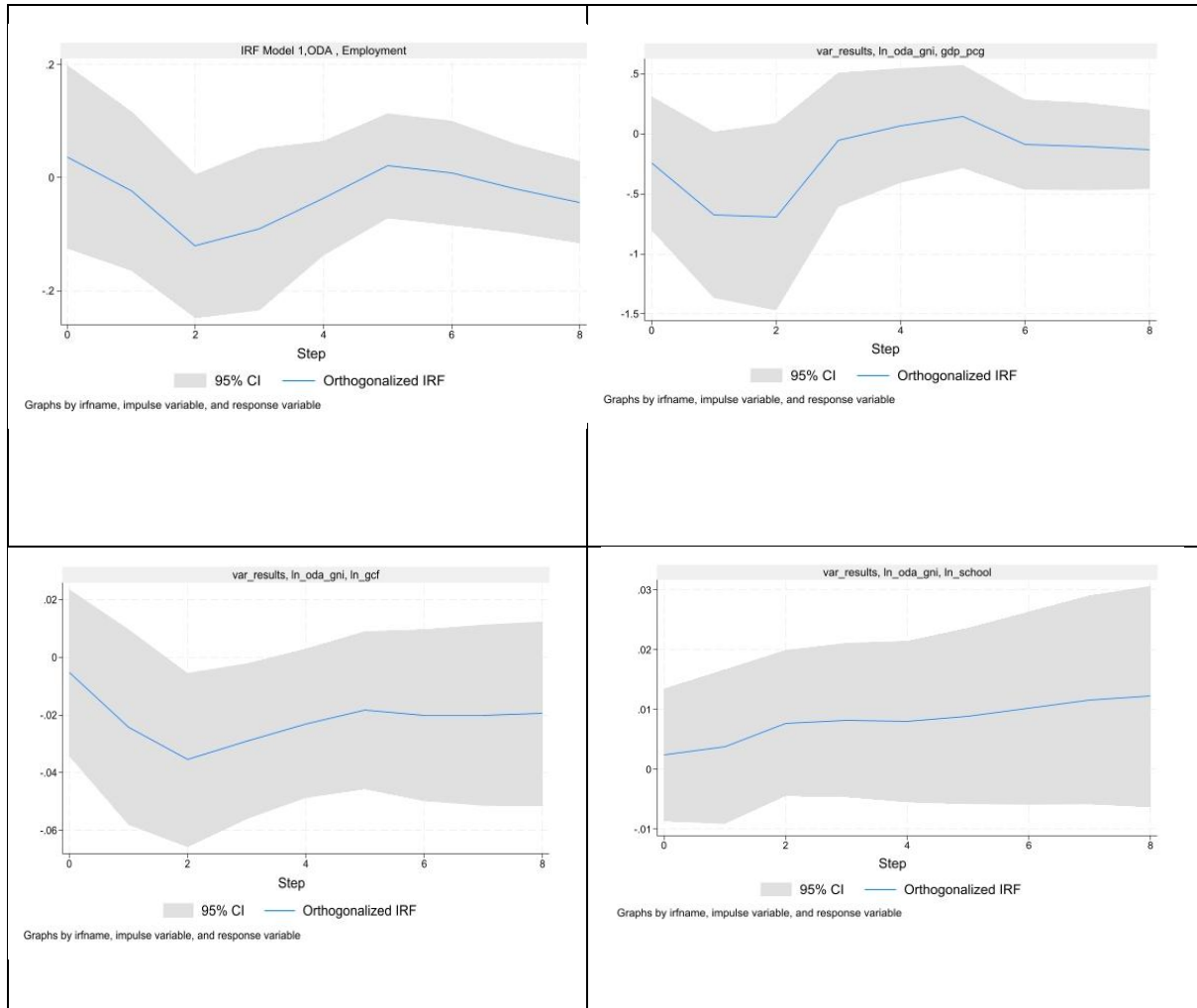


Figure 8 Impulse Response Function, Model one

Figure 9 shows the IRF results, when the source of development assistance is multilateral donors. The effect of one aid shock in this case seems to immediately and slightly increase employment, unlike the aggregate model. This effect turns negative at year 2 and gradually turns positive afterward, yet non-significant. The effect of multilateral assistance on economic growth and Gross capital formation are also instantly negative, yet they take more time to turn positive (year five) unlike the aggregate aid (year three).

Finally, we investigate the effect of one standard deviation shock of development assistance on secondary schooling, the IRF graphs shows a small but persistent decline in school enrollment over the 0–8 period. Similar results are indicating when testing for the effect of one multilateral aid shock on school enrollment. The associated 95% confidence intervals, in both models, overlap zero throughout, indicating that the estimates are not statistically significant. Noticeably, the negative sign could be consistent with short to medium-run adjustment dynamics in which the inflow of development assistance temporarily alters incentives or reallocates resources away from schooling. For example, if aid is directed toward infrastructure rather than directly improving educational access, or if it generates labor market opportunities that encourage early school leaving. In the absence of

statistical significance, these patterns should be interpreted cautiously. Considering that development assistance, specifically the World Bank, has targeted the education sector's reform across the studied period. These findings can also be interpreted as a failure of assistance in backing these reforms.

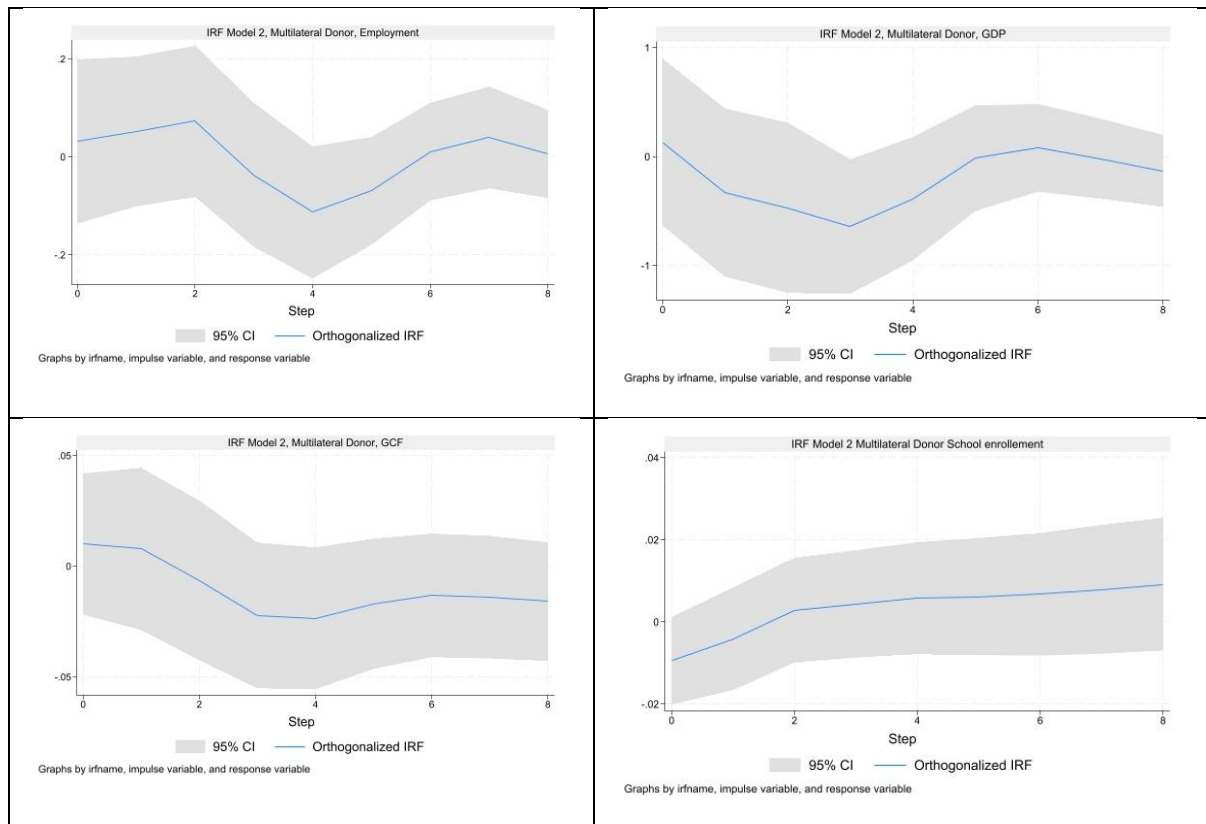
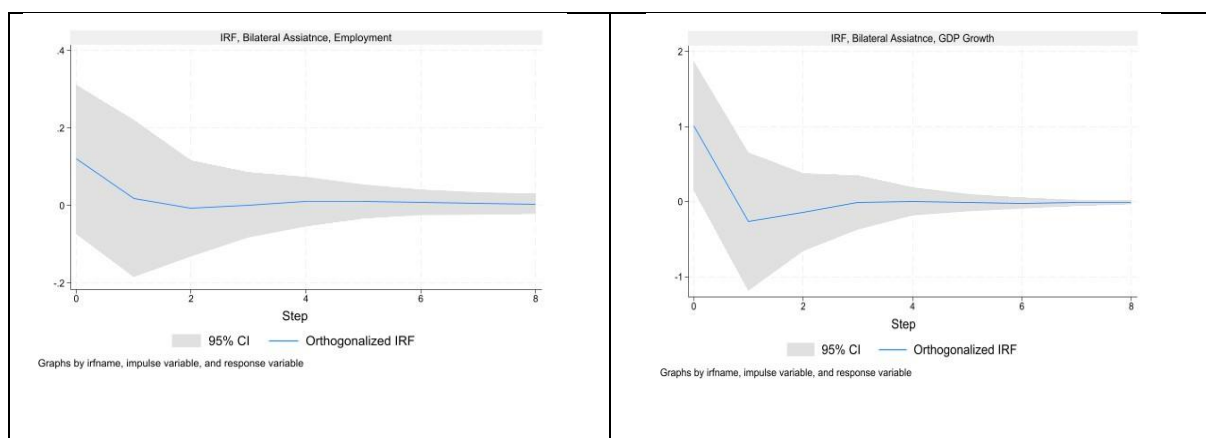


Figure 9 Impulse Response Analysis, Model Two (Multilateral Assistance)

Figure 10 shows the IRF results from Bilateral donors. The four graphs show that development assistance negatively affects economic growth, investment, school enrollment and employment. In all the graph this effect is non-significant. It is also very short lived compared to model 1 and 2. The effects is negative yet quickly rebound to zero in the second period.



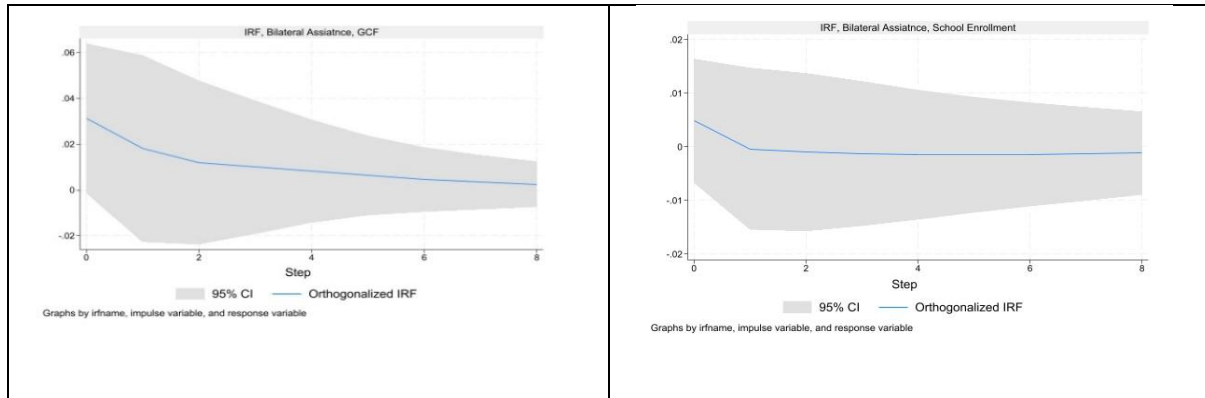


Figure 10: Impulse Response Analysis, Model Two (Bilateral Assistance)

The donor-type disaggregation still treats development aid as a single block within each category as well demonstrate similar results. Yet, foreign aid is often allocated targeting different sectors such as education, health, infrastructure, and governance, each of which may influence macroeconomic outcomes differently. As highlighted by Aljonaid et al (2022) the overall effect of aid on growth is weakened because different sectors respond to aid in different ways. The overall effect of aid on investment, employment, and human capital formation, can also be different if addressed from a sectorial stand. Unfortunately, disaggregated data on sector-specific aid allocations is not available for Tunisia. As a result, we are unable to directly assess the impact of aid to specific sectors such as education, health, or infrastructure. Instead, we focus on examining the effect of total official development assistance on employment levels within the manufacturing and services sectors. This approach aims to capture whether development assistance, presumed to support employability and productive economic growth, has translated into positive employment outcomes in key areas of the economy. In this case, we are interested in the causal link between official development assistance and employment in the industrial and services sectors. These two sectors were often directly targeted by ODA during the first 20 years of our study period, as highlighted in the background section.

The graphs in figure 11 show the effect of a development shock on employment in the services sector and the industrial sectors. Figure 11 indicates that an aid shock has no statistically significant effect on employment in services, nor in the industrial sector over the 8 period. In both cases, however, we see that effect is positive. For industrial employment there is a slight positive response on impact, it quickly turns negative around the first period and then converges back toward zero, with confidence intervals consistently overlapping zero. Similarly in the services sector, the shock results present comparable trends. The difference lies in the size of the impact, where it is more important in the services sector and immediately falls to zero in the second step. In the industrial sector, on the other hand, the impact is much less important and gradually falls to zero by the 4th step. These results suggest that in the short to medium term, ODA shocks do not translate into measurable sectoral employment gains in Tunisia.

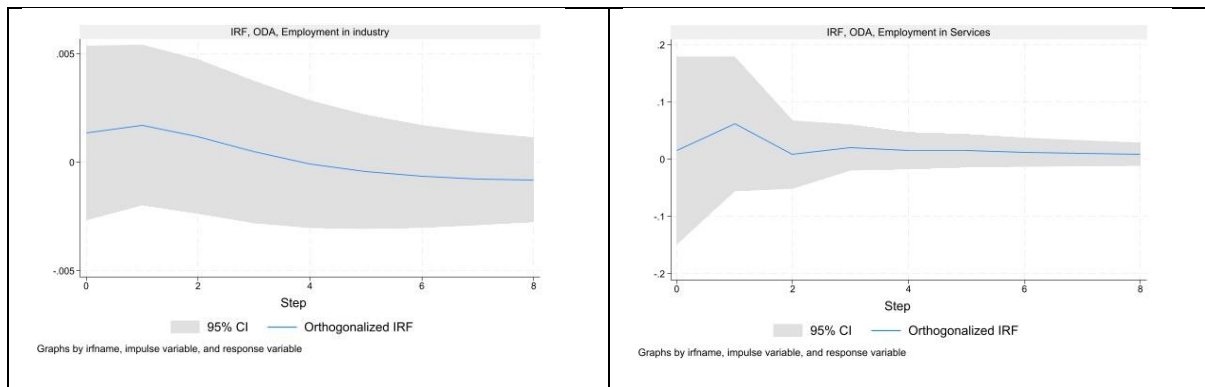


Figure 11 Impulse response function Model 4 (per sector employment)

In the Theoretical framework, we have predicted that development assistance should raise investment, GDP growth, and employment. We first Hypothesizes that **Development assistance has a positive and statistically significant effect on economic growth and investment levels (H1a)**. Then, we have hypothesized that **Economic Growth and investments and education have a positive and statistically significant effect on employment levels (H1b)**. Our results do not support these predictions.

In the reduced-form VAR, aid co-moves with investment and GDP growth and exhibits predictive content; however, once we identify an exogenous “aid shock” in the SVAR, its impulse responses turn statistically insignificant for GDP, investment but remains negative. The apparent discrepancy between VAR and SVAR is methodological rather than practical. Reduced-form VAR results capture predictability that may arise from correlated innovations and indirect/common shocks. By contrast, the SVAR isolates structural aid disturbance; under our identification, this shock has no measurable causal effect on the macro variables considered. We therefore reject H1 and conclude that, in our sample and under the maintained identification assumptions, there is no evidence of a direct causal link from an aid shock to investment, and growth.

In sectoral estimates as well as donor specific estimates the negative effect of aid on general employment found in model 1 (aggregate results) is reversed but remain insignificant. Aid shocks positively affect employment in general if they are disbursed by multilateral donors. It also affects employment positively when examined by sectors. The interpretation provided earlier in the reduced form, which focused on donor motives, possibly explaining the different coefficient signs found between the two models cannot fully explain the positive effect found in sectorial employment. One might wonder why the effect of total disbursed development assistance in Tunisia would indicate a negative effect on total employment, but not on specific sectorial employment? The question itself offers some answers and might reflect more internal dynamics in the Tunisian labor market. Total

employment includes employment in the agricultural sector. As highlighted, in the background section, employment in agriculture has been declining since the 1990's, reflecting a lower capacity to absorb labor, therefore while aid might positively increase employment in sectors it targets, the effect might be dampened if we consider the agricultural sector.

The SVAR model treats employment as the most endogenous variable. This means that the impulse response we find to an aid shock already incorporates any instantaneous effect it might have on education and investment, and economic growth which in turn influence employment in the same period. Considering the non-significant results found across the models, we can reject the Hypothesis that following an aid shock economic growth, investments and education have a positive and statistically significant effect on employment levels. **Therefore, development assistance inflows per our model and data are ineffective in generating employment in Tunisia.**

9. Discussion

The empirical results do not support the study's central hypotheses. Guided by the theoretical framework derived from the general employment theory, we assumed that an increase in investment stimulated by development assistance, would stimulate output growth and, consequently, lead to an increase in employment levels in the short run. However, the impulse response analysis shows no statistically significant effect of an aid shock at any horizon, as the estimated responses are consistently surrounded by confidence intervals that include zero. These findings imply that, within the scope of the present models and time frame, the expected short-run transmission mechanism from development assistance to investment to growth to education and then to employment does not materialize in the data. The rejection of our hypotheses suggests that either the assumed causal pathway is weaker or more complex than predicted by the general employment theory, or that other intervening factors may obscure the short-run relationship, such as institutional factors, or aid fungibility, especially since the reduced VAR model has illustrated a significant association between official development assistance investment levels and economic growth.

Reviewing these findings from a contextual and chronological perspective can highlight the dynamics that might have shaped these findings. The development assistance covered by the study focuses on two distinct time periods, in which several programs were implemented mainly driven by multilateral donors, such as the IMF and World Bank adjustment programs, the Euro-Mediterranean partnership program, the EU neighborhood program and the 1995 free trade agreement. The inflow coming from these structures and programs considering its importance, could have influenced the economic structure in Tunisia.

Looking first at the 1990 and pre-revolution period, Blin (2009) and Harrigan et al., (2009) and Harrigan (2009, 2011), argue that Tunisia's achievements in macroeconomic stability, economic

diversification, and poverty reduction were notable and to which aid certainly played a role. This success was largely the result of a unique, gradualist, and state-led development strategy that often departed from traditional donor prescriptions. However, this “success” was only partial. Aid and reforms failed to adequately address deep-rooted challenges such as unemployment, low levels of private investment, and pervasive political repression. These factors ultimately fueled significant social unrest later in 2011 and illustrated the depth of the social and economic crisis. The industrial policy (Programme de mise à niveau (PMN)) only realized 59% of the planned investment, increased employment by 21% and increased export sales of benefiting enterprises by 45% (Blin, 2009). While the Tunisian government presented these as an indicator for the program success. Evidence, investigating the association between other capital flows supporting the PMN and employment, shows little effect. For instance, an impact assessment of the 1995 free trade agreement indicates that before trade liberalization, some industries grew by adding more workers. However, after the implementation of the free trade agreement, growth came mainly from making each worker more productive, but not from hiring more people. The shift did little to boost job creation across the economy, especially since exports weren’t high value enough to generate trade surpluses.

These findings highlight the non-success of the programs supported by development assistance in generating employment, but do not address why assistance did not stimulate the needed outcome expected from such programs. One explanation is the misallocation of resources and poor implementation of economic programs in Tunisia. Despite being internationally celebrated for its strong and competent administration, capable of negotiating favorable terms with the Bretton Woods institutions, Tunisian policymakers appear to have failed to plan or execute their intended reforms effectively. This raises questions about why such an apparently capable system would produce underwhelming results in terms of employment and inclusive growth. This problem is not only about weak planning. Political factors also played a major role in shaping outcomes. Policies and aid flows were often influenced by political practices rather than development priorities. From the donor side, political and strategic interests often decide aid allocation in the MENA region. Collier and Dollar (2002) compared actual aid disbursements with a “poverty-efficient” allocation. In 1996, based on poverty levels, Tunisia should have received no aid, yet it was one of the largest beneficiaries. This shows a clear gap between need-based aid allocation and what happened in practice. Politically motivated aid often reduces its effectiveness in solving real development problems. Blin (2009) and Harrigan (2011) presents security concerns, and political stability as a top priority for donors, in the overall MENA region. This often supports autocratic regimes that failed to address unemployment and inequality. In the specific case of Tunisia, in addition to those priorities, a pro-Western foreign policy, Western-inspired secular society, and clear commitment to eradicating terrorism were leveraged by the Tunisian government to its advantage in securing aid. For instance, Hibou, (2006) explain that industrial policy (PMV) is a highly political process. It served to manifest the state's will to modernize

"from above" while in practice exercise political control over enterprises. This implied that entrepreneurs benefiting from the program would have to maintain their support to the regime and expand its reach. Additionally, evidence suggest that the beneficiaries of the privatization process of public enterprises of the 1990s and 2010s were dominated by politically connected elites, with little access and more barriers to on affiliated entrepreneurs(Kruse et al., 2021).

The Tunisian case before the revolution shows that the ineffectiveness of development assistance was not only poor planning or technical mistakes. It was a deeper structural issue rooted in political economy. When aid is driven by political reasons, and when the economy is controlled by elites, even large aid inflows cannot create inclusive growth. Instead, they reinforce the structures that keep inequality and exclusion in place. However, does the same analysis hold for the post revolution dynamics?

Post 2011, Tunisia's political landscape, characterized by power-sharing and moderation, was supposed to provide a more suitable environment for economic reforms and breaking with previous practices. Considering the large inflow of development assistance from both multilateral institutions and bilateral ones, the effect would be expected to be positive and successful in tackling the persistent challenges Tunisian economy face specifically high unemployment and regional inequalities.

However, in practice the expectation was far from being achieved. Becheikh, (2021), highlights that between 2010 and 2018, Tunisia's economy saw a sharp decline, mainly driven by political instability, terrorist attacks, political assassinations, and frequent labor strikes. Foreign Direct Investment fell from \$1.33 billion to \$0.99 billion. Unemployment jumped from 13.05% in 2010 to 18.33% in 2011 and eased to 15.51% by 2019. External debt rose to 90% of GNI, the Tunisian Dinar lost nearly half its value against the USD, and inflation became a major problem by 2018. Additionally, Corruption, favoritism, and inefficiencies were amplified after the revolution as the consecutive governments converted corrupted businessmen into political capital rather than prosecuting them, allowing them greater influence on economic and political decisions. The persistent unemployment rates and macroeconomic instability the country has been facing in the past 10 decades can explain the ineffectiveness of development assistance. Nabi, (2021) simulated Tunisia's economic performance after 2011, using 2010 as the reference year. The findings suggest that the economic downturn could have been avoided if policymakers had not focused on short-term macroeconomic management. In their scenario, they combined a rebalancing of public expenditure with a higher level of Total Factor Productivity (TFP) growth. This combined approach produced strong positive effects. Economic growth would have reached 5.3%, and the unemployment rate would have fallen to 6%. The combination of these events weakened Tunisia's leverage and its ability to negotiate favorable aid terms. This was especially the case because Tunisia had limited access to financial partners beyond its traditional ones, further reducing its bargaining power (Becheikh, 2021; Hecan, 2016; Zardo, 2017).

From the donor side, mainly the EU, and individual member states, approached aid to Tunisia with varying, but often self-interested, priorities. Most of the development assistance targeting economic recovery, mainly aimed at sustaining EU business interests and expanding European beneficial business relations. Ekiz, (2022) have highlighted that speeches by member state leaders show that they view Tunisia as a long-term economic partner and want to expand business relations in various fields, specifically in Tourism and the Energy sector. Member countries perceived Tunisia as an emerging market where they can sell their technology and know-how. The development assistance was also used as a leverage to push for a migration agreement. At the wake of the revolution Italy quickly rushed to sign a migration agreement with Tunisia explicitly offering EUR 200 million in aid and credit in return for migration policing (Zardo, 2017). Italy also actively lobbied within the European Union further pushing the migration agenda with North African countries forward.

Therefore, in Tunisia, development assistance is often tied to political priorities. This limits its economic impact. Before the revolution, the country could attract assistance and negotiate better terms. However, corruption and poor governance reduced the benefits. After the revolution, Tunisia's negotiating power became weaker. Assistance terms no longer matched national needs, despite official claims. As a result, the assistance has not delivered the expected economic results, especially for employment.

10. Conclusion

Does development assistance contribute to employment creation in Tunisia? Our findings suggest that there is no causal pathway from increased development assistance to employment levels in Tunisia. By examining assistance disbursements and their interaction with key economic indicators, the study highlights that a causal effect cannot be demonstrated based on these results. The data indicates that an association exists between development assistance, economic growth, and investment levels. Yet this association is negative. The absence of a causal link and the negative association reflect broader economic and political dynamics within the country that affect the employment–development assistance nexus.

Much of the assistance has supported liberalizing and modernizing the economy both before and after the revolution. This pattern reflects both donor-side motivations—often political and economic rather than developmental—and domestic political economy constraints. In particular, elite capture of economic resources, the concentration of aid-supported projects in sectors dominated by politically connected groups, and weak linkages between aid and private-sector job creation have hindered the capacity of aid to address Tunisia’s labor market challenges.

Overall, the research shows that for aid to create jobs in Tunisia, both donors and the government must change their approach. On the donor side, aid allocation should clearly target employment outcomes. It should focus on sectors that can absorb a large number of workers and have strong potential for value-added growth, rather than expecting job creation to emerge as a spillover of economic growth. This allocation must be supported by clear and SMART employment policies that address both increasing capacity and making full use of existing capacity by Tunisian policymakers. On the domestic side, political stability, effective democratic governance, limiting elite capture, and linking aid-supported projects to broader industrial and employment strategies are crucial to ensure significant and positive outcomes. Without these changes, aid will continue to act mainly as a stabilizing tool without bringing the inclusive growth and labor market improvements that Tunisia urgently needs.

By highlighting these dynamics, this study not only fills a gap in the literature but also offers a framework for rethinking how aid can be designed and implemented to maximize its employment impact in middle-income economies

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Appendix A: Reduced Form VAR Model Results

Model 1: Total employment, Total Disbursed ODA, GDP, Gross Capital Formation, School Enrollment Secondary Level

Table 5: Estimated Coefficients from the VAR Model 1

Table 1.1: Dependent Variable: Employment to Population Ratio		
Independent variables	Coefficient	Std. Error
L. Employment to Population Ratio	0.0897	(0.189)
L. Official Development Assistance	-0.282	(.228)
L. GDP per capita growth (annual %)	0.044	(0.040)
L. Log Gross Capital Formation	0.742	(0.909)
L. Log School Enrolment	-1.644**	(0.664)
Constant	41.322***	(9.205)
Observation	31	
R^2	58	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1.2: Dependent Variable: Official Development Assistance per capita

Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	0. 0161	(0. 101)
L. Official Development Assistance	0. 632***	(0.122)
L. GDP per capita growth (annual %)	- 0. 001	(0.215)
L. Log Gross Capital Formation	- 0. 362	(0. 486)
L. Log School Enrollment	0.580	(0. 355)
Constant	- 1.801	(4.874)
Observations	31	
R^2	59	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1.3: Dependent variable: GDP per capita growth (annual %)

Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	-3.093***	(0.758)
L. Official Development Assistance	-3.176***	(0.913)
L. GDP per capita growth (annual %)	0. 164	(0.161)
L. Log Gross Capital Formation	- 0.396	(3.636)
L. Log School Enrollment	- 9.439***	(2.656)
Constant	181.178***	(35.042)
Observations	31	
R^2	48	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ **Table 1.4: Dependent Variable Gross Capital Formation**

Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	-0. 091 ***	(0. 0322)
L. Official Development Assistance	-0. 068 *	(0. 0388)
L. GDP per capita growth (annual %)	0. 0025	(0. 0068)
L. Log Gross Capital Formation	0. 802 ***	(0. 1545)
L. Log School Enrollment	-0. 301 ***	(0. 1128)
Constant	5.589 **μ	(1. 5483)
Observations	31	
R^2	71	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1.6: Dependent Variable: Log School Enrollment

Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	0.0964	(0.0142)
L. Official Development Assistance	-0.0086	(0.0171)
L. GDP per capita growth (annual %)	-0.001	(0.0031)
L. Log Gross Capital Formation	-0.0247	(0.0678)
L. Log School Enrollment	0.948***	(0.0542)
Constant	-0.0161	(0.707)
Observations	31	
R^2	95	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Model 1: Diagnostic Tests

Table 6 Lagrange-multiplier test

lag	chi2	df	Prob > chi2
1	29.3386	25	0.25001
2	22.3241	25	0.61697

Table7: Normality Test for Var residuals Model 1

Equation	Jarque-Bera χ^2 (df=2)	p-value	Skewness χ^2 (df=1)	p-value	Kurtosis χ^2 (df=1)	p-value
Employment to Population Ratio	6.264	0.04364	2.089	0.14838	4.175	0.04103
Official Development Assistance	1.518	0.46806	0.791	0.37391	0.728	0.39363
GDP per capita growth (annual %)	0.261	0.87770	0.111	0.73910	0.150	0.69856
Log Gross Capital Formation	0.095	0.95349	0.056	0.81275	0.039	0.84315
Log School Enrollment	0.474	0.78890	0.171	0.67892	0.303	0.58208
ALL	8.612 (df=10)	0.56926	3.218 (df=5)	0.66644	5.394 (df=5)	0.36967

Table 8: Eigenvalue Stability Condition

Eigenvalue	Modulus
0.8846229	0.884623
0.7926798	0.792680
0.616487	0.616487
$0.1608988 + 0.3704127i$	0.403849
$0.1608988 - 0.3704127i$	0.403849

All the eigenvalues lie inside the unit circle.

⇒ The VAR model satisfies stability condition.

Model 2: Total employment, Total Disbursed ODA by Multilateral Donors, GDP, Gross Capital Formation, School Enrollment Secondary Level

Table 9: Lag Order Selection Criteria Model 2

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-69.9776				0.000146	5.35554	5.42827	5.59343
1	5.80371	151.56	25	0.000	4.0e-06*	1.72831	2.16467	3.15567*
2	25.0633	38.519	25	0.041	7.3e-06	2.13834	2.93833	4.75517
3	51.0719	52.017	25	0.001	0.000012	2.0663	3.22992	5.87259
4	99.3161	96.488*	25	0.000	9.6e-06	0.405996*	1.93325*	5.40176

Table 10 Estimated Coefficients from the VAR Model 2

Table 6.1: Dependent Variable: Employment to Population Ratio		
Independent variables	Coefficient	Std. Error
L. Employment to Population Ratio	0.158	(0.194)
L. Official Development Assistance (Multilateral Donor)	0.083	(0.216)
L. GDP per capita growth (annual %)	0.052	(0.041)
L. Log Gross Capital Formation	0.656	(0.959)
L. Log School Enrolment	-1.688**	(0.708)
Constant	38.643***	(9.158)
Observation	31	
R^2	51	

Table 6.2: Dependent Variable: Official Development Assistance per capita

Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	-0.146	(0.146)
L. Official Development Assistance (Multilateral Donor)	0.437***	(0.162)
L. GDP per capita growth (annual %)	- 0.005	(0.308)
L. Log Gross Capital Formation	0. 049	(0. 719)
L. Log School Enrollment	0.539	(0. 531)
Constant	5.311	(6.868)
Observations	31	
R^2	43	

Table 6.3: Dependent variable: GDP per capita growth (annual %)

Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	-2.872***	(0. 857)
L. Official Development Assistance (Multilateral Donor)	-1.647**	(0.952)
L. GDP per capita growth (annual %)	0.200	(0.181)
L. Log Gross Capital Formation	1.457	(4.224)
L. Log School Enrollment	- 7.477***	(3.120)
Constant	149.464***	(40.336)
Observations	31	
R^2	43	

Table 6.4: Dependent Variable Gross Capital Formation

Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	-0.084 **	(0.0337)
L. Official Development Assistance (Multilateral Donor)	-0.022 *	(0.0375)
L. GDP per capita growth (annual %)	0.003	(0.0071)
L. Log Gross Capital Formation	0.827 ***	(0.166)
L. Log School Enrollment	-0.271 **	(0.1228)
Constant	5.123 ***	(1.588)
Observations	31	
R^2	68	

Table 6.5: Dependent Variable: Log School Enrollment

Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	0.0131	(0.0142)
L. Official Development Assistance (Multilateral Donor)	0.0092	(0.0171)
L. GDP per capita growth (annual %)	-0.0006	(0.003)
L. Log Gross Capital Formation	-0.0346	(0.0701)
L. Log School Enrollment	0.919***	(0.0518)
Constant	-0.094	(0.669)
Observations	31	
R^2	95	

Model 2: Diagnostic Tests

Table 11: Lagrange-multiplier test

lag	chi2	df	Prob > chi2
1	23.6665	25	0.53870
2	20.4808	25	0.72117

Table 12: Normality Test for Var Residuals Model 2

Equation	Jarque-Bera χ^2 (df=2)	p-value	Skewness χ^2 (df=1)	p-value	Kurtosis χ^2 (df=1)	p-value
Employment to Population Ratio	8.329	0.01554	4.242	0.03945	4.088	0.04320
Official Development Assistance (Multilateral donor)	1.290	0.52472	0.000	0.99167	1.290	0.25611
GDP per capita growth (annual %)	0.828	0.66099	0.472	0.49197	0.356	0.55084
Log Gross Capital Formation	0.632	0.72916	0.346	0.55614	0.285	0.59325
Log School Enrollment	4.554	0.10261	0.488	0.48494	4.066	0.04376
ALL	15.632 (df=10)	0.11065	5.548 (df=5)	0.35271	10.084 (df=5)	0.07288

Table 13: Eigenvalue Stability Condition

Eigenvalue	Modulus
0.9291778	0.929178
0.7330965	0.733097

0.4728066	0.472807
$0.2039697 + 0.411718i$	0.459473
$0.2039697 - 0.411718i$	0.459473

⇒ All the eigenvalues lie inside the unit circle.

The VAR model satisfies stability condition.

Model 3: Total employment, Total Disbursed ODA by Bilateral Donors, GDP, Gross Capital Formation, School Enrollment Secondary Level

Table 14: Lag Order Selection Criteria Model 3

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-51.2226				0.000044	4.16464	4.23599	4.40461
1	17.5855	137.62	25	0.000	1.8e-06	0.919596	1.34773	2.35941
2	32.96	30.749	25	0.197	4.5e-06	1.63259	2.4175	4.27226
3	83.762	101.6	25	0.000	1.3e-06	-0.27867	0.863019	3.56085
4	159.735	151.95*	25	0.000	1.6e-07*	-4.05447*	-2.55601*	0.984891*

The recommended Lag by the selection criteria is 4, However, it gives an unstable model, and the residuals are multi colinear. While the recommendation is often to increase the lag until the stability tests are correct, we reduce the lag for two reasons. The first is that we have a small number of observations, in this case adding more legs would imply losing more degrees of freedom and overfitting the model. The second is that we wish to compare the findings for the multilateral aid where the recommended lag was (1). Therefore, to avoid the issue that arises with high lag numbers, ensure that our models are comparable we choose a lag (1)

Table 15 Estimated Coefficients from the VAR Model 3

Table 11.1: Dependent Variable: Employment to Population Ratio		
Independent variables	Coefficient	Std. Error
L. Employment to Population Ratio	0.165	(0.193)
L. Official Development Assistance (Bilateral Donor)	-0.256	(0.324)
L. GDP per capita growth (annual %)	0.055	(0.041)
L. Log Gross Capital Formation	0.710	(0.943)
L. Log School Enrolment	-1.325	(0.805)
Constant	38.924***	(9.618)
Observation	31	
R^2	49	

Table 11.2: Dependent Variable: Official Development Assistance per capita		
Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	0.243**	(0.102)
L. Official Development Assistance (Bilateral Donor)	0.033	(0.172)
L. GDP per capita growth (annual %)	0.001	(0.022)
L. Log Gross Capital Formation	-0.438	(0.500)
L. Log School Enrollment	1.115***	(0.427)
Constant	-13.11***	(5.105)
Observations	31	
R^2	30	

Table 11.3: Dependent variable: GDP per capita growth (annual %)

Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	-2.453***	(0. 885)
L. Official Development Assistance (Multilateral Donor)	-0.673	(1.488)
L. GDP per capita growth (annual %)	0.261	(0.191)
L. Log Gross Capital Formation	-0.172	(4.332)
L. Log School Enrollment	- 7.426**	(3.689)
Constant	132.260***	(44.181)
Observations	31	
R^2	26	

Table 11.4: Dependent Variable Gross Capital Formation

Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	-0.078 **	(0.0334)
L. Official Development Assistance (Bilateral Donor)	-0. 005	(0.056)
L. GDP per capita growth (annual %)	0. 004	(0. 0071)
L. Log Gross Capital Formation	0. 817 ***	(0. 163)
L. Log School Enrollment	-0. 237 *	(0. 139)
Constant	4.713***	(1.662)
Observations	31	
R^2	66	

Table 6.5: Dependent Variable: Log School Enrollment

Independent Variable	Coefficient	Std. Error
L. Employment to Population Ratio	0.0119	(0.011)
L. Official Development Assistance (Bilateral Donor)	-0.0109	(0.019)
L. GDP per capita growth (annual %)	-0.001	(0.002)
L. Log Gross Capital Formation	-0.047	(0.056)
L. Log School Enrollment	0.870***	(0.047)
Constant	0.231	(0.573)
Observations	31	
R^2	96	

Model 3: Diagnostic Tests*Table 16: Lagrange-multiplier test*

lag	chi2	df	Prob > chi2
1	23.4709	25	0.55009
2	31.3951	25	0.17627

Table 17: Normality Test for Var Residuals Model 3

Equation	Jarque-Bera χ^2 (df=2)	p-value	Skewness χ^2 (df=1)	p-value	Kurtosis χ^2 (df=1)	p-value
Employment to Population Ratio	8.041	0.01794	3.842	0.05000	4.200	0.04043

Official Development Assistance (Bilateral Donor)	0.252	0.88180	0.121	0.72753	0.130	0.71824
GDP per capita growth (annual %)	1.045	0.59317	0.933	0.33409	0.112	0.73838
Log Gross Capital Formation	0.470	0.79051	0.469	0.49349	0.001	0.97171
Log School Enrollment	7.049	0.02946	0.849	0.35695	6.201	0.01277
ALL	16.857 (df=10)	0.07759	6.213 (df=5)	0.28600	10.644 (df=5)	0.05892

Table 18: Eigenvalue stability condition

Eigenvalue	Modulus
0.8555905	0.855591
0.7171261	0.717126
$0.2465871 + 0.4324465i$	0.49781
$0.2465871 - 0.4324465i$	0.49781
0.08267705	0.082677

⇒ All the eigenvalues lie inside the unit circle.

The VAR model satisfies stability conditions.

Appendix B: Use of Artificial Intelligence (AI)

In this study, I used AI tools, mainly ChatGPT by OpenAI, to assist in the research process. During the thesis design stage, I combined ChatGPT with Google Scholar and Consensus extensions to explore the literature more effectively. In the empirical stage, I also used it to troubleshoot STATA code errors and receive guidance on possible solutions.

All final decisions and interpretations were made by me. AI tools were not used to generate data, analyse results, or draw conclusions. Their role was limited to supporting critical thinking and improving clarity during the planning phase of the thesis.