TURNING EXPORT POTENTIAL INTO EMPLOYMENT

A CASE STUDY FOR JORDAN

International
Trade
Centre

Turning export potential into employment

A case study for Jordan

About the paper

Jordan could create more than 85,000 new jobs, about a quarter of them for women, by unlocking its regional trade potential, according to a new ITC study that identifies export sectors with employment potential by using an innovative methodology.

The export sectors with the highest employment creation potential are clothing, live animals and jewellery. Increasing regional exports in these three sectors could generate over 47,000 jobs across the Jordanian economy. This report guides policymakers in focusing their export promotion on sectors that promise the most employment.

ITC is the joint agency of the World Trade Organization and the United Nations.

Preface

Trade creates opportunities for growth by giving businesses access to a broader customer base beyond the domestic market. Yet, trade is not an end in itself, but should act as a driver of income growth and job creation to benefit people.

The link from 'more trade' to 'more and better jobs' is not automatic, however. The labour market implications of developing exports in one sector versus another are sometimes difficult to compare, while available resources for trade promotion are scarce. To assist policymakers in their strategic decision-making, ITC has developed a methodology to estimate the employment opportunities associated with a country's untapped export potential.

In the case of Jordan, unlocking the regional trade potential across all sectors could help create more than 85,000 new jobs, this new methodology shows. In the clothing sector alone, removing all market frictions and building production capacity to leverage the projected economic growth would add $254 million of exports and create about 22,000 new jobs – not only in the clothing sector itself, but also in input-producing sectors and through increased spending across the economy. Women would particularly benefit, as this sector has the highest share of female employment.

This new methodology is the first that guides the selection of export sectors with employment potential and quantifies jobs created in the sectors themselves, along the associated value chain and across the entire economy. This lens provides strategic insights and empowers policymakers to focus their resources and efforts to promote trade on those sectors that are likely to drive inclusive development and create jobs, across sectors and for different economic actors, such as women and youth. It thus helps countries harness trade to make progress towards achieving Goal 8 of the United Nations 2030 Agenda for Sustainable Development – decent work and economic growth.

Acknowledgments

Contents

Boxes and figures

Acronyms

Unless otherwise specified, all references to dollars ($) are to United States dollars, and all references to tons are to metric tons. The term 'billion' denotes 1 thousand million.

DFD	Domestic final demand
GDP	Gross domestic product
HS	Harmonized System
IMF	International Monetary Fund
ILO	International Labour Organization
ISIC	International Standard Industrial Classification
ITC	International Trade Centre
MENA	Middle East and North Africa
NTM	Non-tariff measure
OECD	Organisation for Economic Co-operation and Development
SDG	Sustainable Development Goal
UNCTAD	United Nations Conference on Trade and Development
WTO	World Trade Organization

Executive summary

Regional trade integration could create more than 85,000 jobs in Jordan, among them almost 21,000 for women, according to new ITC research

Jordan has an unemployment rate of almost 15%. While more than half of its exports are destined for the regional market, according to International Trade Centre (ITC) survey data, Jordanian firms experience around 90% of all problematic non-tariff measures in regional trade. This drives a significant wedge between actual and potential exports in various sectors. Jordan has the potential for overall export growth of $1.8 billion to markets in the Middle East and North Africa region. Targeted trade advice to help overcome all friction and fully realize this potential would create 85,487 jobs, about a quarter of them for women.

ITC has developed a methodology to identify the export sectors with the most potential to create jobs

ITC has developed a comprehensive methodology to estimate the employment opportunities associated with a country's export opportunities. It combines first the ITC export potential methodology used to identify a country's sectors and markets with export growth potential[1], and second data on production, labour content and input-output analysis to calculate how many jobs would be created if the export potential were fully realized.

The results can be disaggregated by export sector, production sector and gender or other demographic characteristics. This makes it easier to identify sectors where additional trade translates into many decent jobs, and empowers policymakers to focus their trade promotion resources on sectors prone to drive inclusive growth.

About a third of the jobs to be created in Jordan are in the export sectors themselves, with the rest across the economy

The employment potential of Jordan from regional exports equates to over 26,100 direct jobs in the export sectors; over 23,200 jobs in input-producing sectors; and over 36,100 jobs in the economy as a whole. About half of the additional jobs would emerge in non-traded sectors such as 'construction' or 'public administration and defence'. For labour-intensive export sectors, such as 'clothing', most new jobs are in the sector itself. For sectors with high value added per worker, such as 'jewellery', almost half of the jobs result from additional consumption in all sectors of the economy.

This new ITC methodology is the first to consider not only direct and indirect jobs that are created in the export sectors themselves and the sectors producing inputs for them. It also accounts for and quantifies jobs that emerge in the whole economy through increased consumption. Thereby, this methodology is superior to simpler approaches that prioritize labour-intensive sectors that may have low productivity and pay comparably low wages.

Outline

Chapter 1 of this study highlights important insights from the existing literature on trade and employment, and discusses how these have fed into the new methodology. Chapter 2 outlines the methodology,[2] discusses the conditions under which it produces realistic and robust estimates for a country, and provides an overview of data sources. Chapter 3 applies the methodology to the case of Jordan's potential job creation resulting from efforts to increase regional trade integration. The report concludes by underscoring the importance of targeted and cohesive policies to make the most of export potential opportunities.

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[1] To make this information accessible to businesses, trade advisers and policymakers around the world, ITC launched Export Potential Map (exportpotential.intracen.org), a free, forward-looking tool that provides comparable information about trade opportunities across suppliers, goods and markets. It turns economic analysis into practical trade information, revealing untapped potential for export growth. It also offers opportunities for diversification with favourable chances of export success for 226 countries and territories across more than 4,200 products.

[2] The technical details of the methodology can be found in the appendix.

CHAPTER 1   TARGETING EXPORT ACTIVITIES AS A DEVELOPMENT STRATEGY

Trade and employment – insights from the literature

This methodology focuses on job creation through additional exports. The academic literature has taken a broader perspective, however, addressing the employment impact of trade and trade liberalization. Questions studied include whether and how trade liberalization affects (un)employment, and under which conditions its effects may vary. The literature has generated some key insights that have inspired and guided the design of our methodology.[3]

Insight 1: Overall, trade reduces unemployment

Classic models of international trade, such as the Ricardo and Heckscher-Ohlin model, assumed full employment. Therefore, they addressed the impact of trade liberalization on relative wages, but not on job creation. Davidson, Martin and Matusz (1988) were the first to introduce unemployment into a trade model. They showed that several important insights from the traditional models did not extend to situations with unemployment.

Subsequent literature examines whether trade liberalization increases or reduces unemployment. Much of this literature focuses on the impact of trade liberalization, looking at how relative price changes affect imports and exports and, hence, employment. While it can take several years to adjust to new trade policies (e.g. Artuç et al., 2010), 'an increase in openness to trade tends to decrease (although only slightly) the national unemployment rate' according to the World Trade Organization (WTO) 2017 World Trade Report, referring to evidence by Dutt et al. (2009) and Felbermayr et al. (2011).

The insight that trade offers opportunities for job creation is the key motivation for this methodology.

Insight 2: The gains from trade are not distributed equally

Several papers have studied the impact of trade liberalization, exposure to import competition or increased market access on employment in different sectors for different countries (see, for example, Dix-Carneiro and Kovak, 2017, for Brazil; Dauth et al., 2014, for Germany; and Caliendo et al., 2015, and Autor et al., 2013, for the United States).

The evidence clearly shows that gains from trade are not distributed equally across sectors, and that trade liberalization is likely to lead to unemployment in some sectors (or regions), even if the overall effect is positive.

The new ITC methodology is based on the insight that the employment effects of trade vary across sectors. The same value of additional exports[4] in different sectors does not create the same number of jobs, which is why it is necessary to quantify the job creation potential at the sector level.

Insight 3: Negative effects of trade are often more direct than positive effects

The direct negative effects of trade can be very salient (e.g. job losses due to delocalization). However, many of its positive effects are usually indirect (e.g. job creation in industries in related sectors or in the economy as a whole). This makes it particularly important to account for the role of international production linkages (e.g. Hummels et al., 2001). As noted in the WTO 2017 World Trade Report, 'when looking at the issue of the impact of trade on wages and employment, ideally, one should consider both direct and indirect effects of trade'.

This methodology accounts for national production linkages as a source of indirect job creation, and for international production linkages by modelling exports and imports of both intermediate and final goods.

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[3] For recent, in-depth reviews of the literature on trade and employment, see WTO (2017), Muendler (2017) and UNCTAD (2018).

[4] The methodology abstracts from import competition, as its main purpose it to identify sectors that should be targeted by export promotion.

Insight 4: Employment effects occur in both tradable and non-tradable sectors

Evidence from different countries shows that trade significantly affects employment in both tradable and non-tradable[5] sectors (Autor et al., 2013, for the United States; Dauth et al., 2014, for Germany; and Menezes-Filho and Muendler, 2011, for Brazil – highlighted in the WTO World Trade Report 2017).

This methodology takes into account job creation in non-tradable sectors through possible indirect employment effects (in upstream sectors) and induced employment effects (in all sectors, through increased consumption).[6]

Policy tools linking trade and employment

Several tools have been developed in recent years for policymakers seeking to leverage trade for employment and inclusive development. To the best of our knowledge, this is the first methodology that identifies export sectors with employment creation potential and quantifies not only direct job creation in the export sectors, but also indirect and induced job creation through value chain linkages and increased consumption.

Models using input-output analysis to study trade and jobs include Kommerskollegium (2015), which calculates the direct and indirect effects of trade on employment, but not the induced effects, and the Organisation for Economic Co-operation and Development (2016), which evaluates the number of jobs sustained by foreign demand.

In 2017, the United Nations Conference on Trade and Development (UNCTAD) developed a Trade and Gender Toolbox that makes it easier to estimate the impact of trade policies on female employment. It uses a computable general equilibrium model to compare situations with different trade policies in place and combines the resulting information with statistics on sector-level labour force participation of women, thereby accounting only for direct employment effects (UNCTAD, 2017),

UNCTAD (2018) proposes a diagnostic tool to identify sectors that combine measures of comparative advantage and minimal labour market frictions. It guides policymakers towards promising sectors which able to hire new workers without major hurdles, but does not quantify the expected increase in employment by sector.

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[5] Tradable goods and services are those that can be consumed in a different location from where they were produced, for example, cars, apples or tax advice. Examples of non-tradable goods and services include freshly prepared food, a haircut, construction or public administration services.

[6] Recent trade and employment literature highlights the significance of labour market frictions and other characteristics (see UNCTAD, 2018, for a detailed overview). These are not included in the methodology because of data constraints. While the methodology thus abstracts from labour market frictions, the importance of the labour market is implicit in Assumption 1 on page 6.

Which export sectors should be targeted?

> Today's policymakers can no longer expect export-led production and trade of manufactures that fuelled industrialization in the East Asian tigers to produce similar outcomes. This is not to say that countries should no longer seek export markets; rather, a much more strategic approach is needed in which countries are more selective in their choices of processes, products and product markets. (UNCTAD, 2016)

Horizontal policies to improve the efficiency of border procedures, harmonize regulations on products and services, and increase transparency of these rules can create an environment that is conducive to exports. Nevertheless, governments do not limit themselves to horizontal policies. They set up specialized agencies, seek developmental aid and negotiate trade rules that are not sector neutral.

Against this reality, Hausmann and Rodrik (2006) say 'interventions that increase the size and profitability of certain activities are legitimate if they contribute to the rest of society through taxes and higher productivity jobs'. They conclude that 'we may be doomed to choose, but we should only choose when the maximum amount of information has been revealed'.

Such a strategic approach should answer two questions: (1) in which products and markets can a country expand its exports and (2) which strategy should a country pursue to support sustainable and inclusive economic development?

Box 1   ITC export potential assessment methodology at a glance

The ITC export potential assessment methodology identifies a country's products or sectors with export potential across international markets based on detailed trade and market access statistics. It considers three main factors – supply, demand and ease of trade.

Supply: The *exporting country's export performance* is based on a projection of its market share in a given product.

Demand: The *market's demand conditions* are measured by a projection of imports while accounting for relative market access of a given product.

Ease of trade: The *ease of trade* between the exporting country and the target market is measured by the total bilateral trade value relative to what it would be if the exporting country held the same share in the target market as in the world market.

Combining these three factors gives a potential export value that can be compared with the actual one to reveal untapped trade opportunities a country may have for any of its exports in new or existing markets. While calculated individually for every exporter × market × product combination, aggregation across products and markets can indicate a country's total export growth potential.

Untapped opportunities may arise from complex rules of origin or other non-tariff measures, a difference in the variety supplied and demanded in the destination market , lack of market intelligence or another reason an exporter cannot sell products in a market where demand and access conditions are attractive. Targeted trade advisory services can help firms tap into these opportunities and export more. This approach does not target sectors to be subsidized, but aims to identify and seize export opportunities that have been missed and, in some cases, remove the bottlenecks that prevent companies from realizing their export potential.

To respond to these questions, the ITC methodology first estimates a country's export growth potential across sectors and markets. It then connects this potential increase to an assessment of the number of jobs that could be created – both in the export sector itself and in the economy as a whole, as well as for the entire population and disaggregated by gender. Compared to the existing policy tools discussed above, it has two specific advantages:

- First, it goes beyond standard measures of comparative advantage by identifying sectors through a comprehensive methodology that uses trade, tariff, GDP, population and other data to quantify a country's export growth potential by product and market. Export potential refers to the pattern of trade that one can reasonably expect between two countries for a specific product when taking into account supply, demand and the relative strength of their bilateral trade relationship (Decreux and Spies, 2016).

- Second, the methodology quantifies the expected employment impacts of export growth. Effects can be disaggregated by export sector and employment sector. The methodology considers job creation within each export sector (direct effects) as well as linkages between sectors. Using input-output, it also measures employment created through increased demand for intermediate goods from upstream industries (indirect effects) and greater consumption (induced effects).

Accounting for these linkages is important, as they tend to prioritize sectors in which local value addition and wages are relatively high. In such sectors, the induced effects from an increase in exports may be greater than the direct and/or indirect effects on employment.

CHAPTER 2   ESTIMATING EMPLOYMENT EFFECTS USING DATA ON EXPORT POTENTIAL

Export promotion can significantly affect labour markets when low demand causes unemployment.[7] Assessing export potential provides an overview of sectors with additional room for growth. Combining this assessment with employment data and input-output analysis permits calculations of the direct, indirect and induced employment impacts[8] that could result if a country's untapped export potential is used fully. Indirect and induced effects can also be thought of as spillover effects from the export sector through demand for inputs from upstream industries (indirect effects) and consumption (induced effects).

Direct impacts of export expansion

Direct effects describe new jobs in the sector of the final export. They arise because the additional exports require expanded production, which means more jobs are available in the sector. Under the assumption of constant returns to scale, the manpower needed to manufacture a product (known as the labour content of production) does not change over time. This implies that employment creation by sector is proportional to the production increase. For example, if 10,000 workers are needed to produce a certain amount of clothing and production increases by 10% because of additional exports, 1,000 direct jobs will be created in the 'clothing' sector.

The calculation only requires data on labour content of production at the sector level. Disaggregated labour content data by gender and age group allows the computation of employment effects for different economic actors.

Indirect impacts of export expansion

Indirect effects occur in different sectors, but within the value chain of the final export. Expanded production implies that more inputs from other sectors are required, creating jobs in those upstream sectors. For example, if clothing exports increase, more textile inputs are needed to manufacture the additional clothing, which creates jobs in the textile sector.

This methodology uses input-output analysis to evaluate the indirect effect that increased exports would have on employment. The indirect effect arises from stronger demand for inputs used to produce the good for which demand has increased. The production of these inputs again requires inputs, triggering a multiplier effect on production, and therefore also on employment, in several sectors of the economy.

Input-output (IO) matrices represent intersectoral relations. They were formalized by Wassily Leontief for the case of a closed economy (see, for example, Leontief, 1966), and later expanded by other authors for the case of an open economy (see, for instance, O'Hagan and Mooney, 1983). The analysis starts from a transaction table, which describes how domestically produced or imported goods and services allocate across the different production sectors (as inputs) and domestic final demand.

This information can be used to calculate how additional exports in one sector translate into additional production in all upstream industries. This depends on two factors, which can be derived from the information in the input-output matrix:

- the share of intermediate goods produced by upstream industries among inputs to production in the export sector (the technical coefficients), and

- the share of intermediate goods that are produced domestically.

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[7] Other explanations of unemployment involve, for instance, the qualification of the labour force, which can be tackled by education and vocational training. They are not part of this analysis.

[8] See the technical appendix for full details on the calculations of direct, indirect and induced effects.

Increased production in upstream industries creates jobs in these sectors (indirect employment effect). As for the direct employment effect, this methodology assumes constant returns to scale, that is, employment creation proportional to the production increase in each sector.

For any increase of exports in a given sector, the method indicates the total number of jobs created in every sector. The possibility of computing indirect employment effects of exports is a key advantage of the method proposed here, as these effects can make an important difference in practice. Total employment effects are always equal to or greater than direct employment effects. When production relies on inputs that are produced domestically by labour-intensive sectors, the multiplier effect can be large, with important indirect job creation. On the contrary, the multiplier effect is small when inputs are mostly imported.

Induced impacts of export expansion

Induced effects occur in the economy as a whole. Increased production means more income and consumption, which further stimulates demand and job growth in all sectors. The Leontief approach described above focuses on the impact of increased demand on production in upstream industries. But more production also generates additional revenues that accrue to households, companies and the government, allowing them to consume and invest more, which ultimately creates jobs in other sectors. For example, if the 'clothing' sector expands exports and hires more workers, they may use their wages to increase consumption. If they spend part of their wages in restaurants, this will cause the restaurant sector to expand and hire more workers.

Considering this effect has an impact on the ranking of export sectors in terms of employment potential. Direct employment effects are larger for export increases in sectors with low labour productivity. For instance, the same export value increase will generate more direct employment in the vegetable sector than in the pharmaceutical sector, as the former uses more manpower than the latter.

Induced employment effects, however, are higher for export increases in value-added sectors. For example, if additional exports in pharmaceutical products create 100 new high-paid jobs for scientists, consumption and associated employment (for example, in local restaurants) are expected to increase more than if additional vegetable exports create 100 new low-wage jobs for agricultural workers. Accounting for induced jobs is important, as it tends to prioritize sectors in which local value addition and wages are relatively high. In such sectors, the induced effects from increased exports may be larger than the direct and/or indirect effects of exports on employment.

In addition to sector-level labour productivity, the induced impact depends on the share of income used for domestic consumption. Additional consumption also triggers more demand for inputs and extra revenue, so a global multiplier effect is calculated.

Assumptions

Measuring employment effects relies on certain assumptions that must be considered when evaluating the suitability of the approach in a given country context. In situations where the assumptions are not satisfied, increasing exports will create fewer jobs than what the methodology predicts.

The results from this methodology therefore represent an upper bound of the employment potential effects. As the main aim of this methodology is to guide policymakers and direct export promotion activities to sectors that are conducive to job creation, this is not per se problematic, as long as the ranking of sectors is not affected.

Assumption 1: Production factors are available.

The key assumption of the method is that a country can expand production (to meet its full export potential) without reducing supply to the domestic market or other markets to which it already exports. In practice, however, labour, capital and natural resources can be limiting factors.

Labour: Unemployment alone does not ensure that appropriate skills are available to realize the export potential in a given sector. The method relies on the assumption that a labour force is available and flexible enough to be allocated to the sectors with greatest demand. Vocational training and education programmes may be needed to ensure that the available skills match those that are required.

Capital: Companies can respond to limited export increases by optimizing the way production capacity is used. However, larger export increases across several sectors require investment in additional production capacity.

Natural resources: The ITC export potential analysis excludes most mineral products, but includes agriculture. Increased agricultural production leads to job creation when arable land is available for cultivation or when yields or product quality can be improved through more labour-intensive production techniques. In countries where arable land is scarce and production is already labour-intensive, the method may overestimate the potential for job creation.

Assumption 2: Increased exports will not have adverse macroeconomic consequences.

With a fully flexible exchange rate, a country's currency tends to appreciate with rising exports, which in turn weighs on the competitiveness of all economic sectors, both in local and foreign markets. However, several developing countries control their currency, in order to improve or protect the terms of trade. Many developing countries also run global trade deficits, reducing the pressure on the exchange rate. In these countries, increased exports do not affect real exchange rates, which makes adverse macroeconomic consequences unlikely.

Assumption 3: Exporting and non-exporting firms have identical production processes, imported input shares and labour productivity levels.

Technical coefficients measure how much of a product j is used as an input to produce another product i. Shares of imported inputs measure how much of this input j is imported rather than procured from domestic firms. Both are necessary to calculate the indirect employment effects of increasing exports.

We assume that country- and sector-level technical coefficients and shares of imported inputs are similar across exporting and non-exporting firms. As firm-level data on labour productivity, production and trade are not available for many developing countries, it is difficult to verify this assumption empirically.

However, as exporting companies are more exposed to international trade, their share of imported inputs is probably larger, especially in countries where inputs are exempt from tariffs when the final good is exported (duty-drawback system). Therefore, even though imports are considered, the multiplier effect associated with inputs may still be overstated.

Labour content corresponds to the number of units of labour needed to produce one unit of output. It is the inverse of labour productivity. In the absence of firm-level data on labour productivity for most developing countries, the labour content of additional production is assumed equal to current labour content.

The trade literature suggests, however, that exporting companies are more productive on average than non-exporting firms (see, for instance, Bernard and Jensen, 2004, and Wagner, 2005). The assumption of identical labour content may lead to an overestimation of the impact of exports on job creation.

Assumption 4: Technical coefficients are stable over time.

The analysis relies on the assumption that technical coefficients (the proportion of inputs used to produce one unit of output) are constant, ruling out possibilities of input substitution, price changes, technological change or increasing returns to scale in terms of input use. Economists and the general public have widely discussed the impact of trade on technological change and, in turn, a (temporary) reduction of employment in certain sectors. Assuming that production processes remain constant therefore likely leads to an overestimation of the employment effects.

Data sources

Data on export potential

Calculations on export potential rely on data from different sources. The measures of market share, imports and ease of trade[9] use five-year averages[10] of trade data from the ITC Trade Map. Reliable direct data (as reported by the country itself) is combined with mirror data (as reported by the country's trade partners) to enhance data quality (for more details, see Decreux and Spies, 2016).

Information for tariff data comes from the ITC Market Access Map for the latest available year. Geographic distance, a proxy for transport costs, is taken from a database prepared by the Centre d'études prospectives et d'informations internationales, gross domestic product (GDP) from the International Monetary Fund (IMF) World Economic Outlook, and population projections from the World Bank's World Development Indicators database. Income elasticity of demand is estimated independently for each sector and by development level (developed versus developing countries). These estimates are also used to calculate induced job creation.

Export potential is calculated for 4,363 product groups based on the six-digit level of the Harmonized System (HS) classification. Certain products not compatible with international conventions, highly dependent on natural resources or not in line with the ITC work program are excluded, and some HS 6 products are aggregated into a product group to allow for consistency across HS revisions.

Production and employment statistics

The Key Indicators of the Labour Market database, issued by the International Labour Organization (ILO) Department of Statistics, provides information on employment by sector for 193 countries going back to 1980. Data are disaggregated by gender and available at the category level of the International Standard Industrial Classification of all Economic Activities (ISIC), revision 2, 3 or 4.

Availability varies greatly, with several countries represented in only a few years and reporting to outdated revisions of the ISIC. Information comes from a number of international repositories, based on several types of sources including surveys, official estimates and censuses.

National sources often provide more recent and/or more detailed production and employment statistics. Generally, they are issued by national statistical agencies. These sources can be used when available. Data from the Jordanian Department of Statistics and ILO Jordan were used for the pilot study on Jordan.

Country input-output matrices

IO tables representing the connectedness of sectors within an economy are needed to estimate indirect and induced employment effects. IO matrices also provide production data and value-added at the sector level.

The Global Trade Analysis Project provides a good inventory for IO tables.[11] Yet, newer or more detailed IO tables may be available through national sources, such as central banks, ministries or other government agencies.

To the best of our knowledge, the most disaggregated table currently available is from the United States and distinguishes 389 sectors. Most IO tables categorize economic activities using the ISIC classification.[12] To match data on export potential on one hand, and on labour and IO relationships on the other, it is necessary to establish a correspondence. A social accounting matrix by the Jordanian Ministry of Planning and International Cooperation was used for the pilot study on Jordan.

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[9] Ease of trade is a measure capturing how easy or difficult it is for a country i to export to another country j, compared with world markets on average.

[10] The data used in this study are based on five-year averages from 2013–17.

[11] For an overview, see https://www.gtap.agecon.purdue.edu/databases/regions.asp?Version=9.211

[12] The Global Trade Analysis Project database uses its own sector classification.

Working with different sector classifications and time periods

To determine the direct impact of increased exports on employment, only data on the labour content of production at the sector level are needed. However, the use of different data sources complicates this step.

Production data can be obtained, for instance, from an IO matrix or other sources. The ILO or national sources generally provide labour data, often with a gender dimension and very rarely with a distinction of youth in the labour force. Both datasets must be merged and, consequently, a high level of detail on one side is of limited use if similar detail is not available on the other side. Besides, data ideally should be from the same year, especially if the economy is evolving rapidly.

Technical coefficients are generally considered as rather stable over time. Hence, if the IO matrix is only used to compute the technical coefficients, it does not have to cover exactly the same year as the sources for labour content and sector decomposition. The difference in years should not be too large, either, because the IO matrix also provides information about the share of intermediate inputs that is produced domestically (which is more likely to vary over time).

CHAPTER 3 CREATING JOBS THROUGH REGIONAL TRADE INTEGRATION: A CASE STUDY FOR JORDAN

Piloting the methodology on Jordan's case of regional integration is of interest for several reasons. First, the Arab region has one of the highest unemployment rates worldwide. According to ILO estimates, 10.2% of the population had no job in 2017. Unemployment stood at 14.9% in Jordan, with 25% of women and 12.8% of men jobless (ILO, 2018).

Second, Arab countries have a high share of unrealized export opportunities within and beyond the Middle East and North Africa (MENA) region. About 42% of the intraregional trade potential is unused among Arab states, 'the second highest share of unrealized export potential after Africa'.[13] Within the MENA region, Jordan has a particularly high share of untapped intraregional export potential – 62%.

Jordan's export potential

Jordanian exports amount to $7.3 billion.[14] Additional exports worth $4.4 billion may be possible, according to the ITC export potential assessment methodology. With over $1.6 billion in the Middle East and $177 million in North Africa, 41% of this untapped export potential lies within the MENA region, suggesting that Jordan could reap large benefits from deeper regional trade integration. As Figure 1 shows, other important destination markets where Jordan could increase its exports include South Asia ($696 million), North America ($498 million) and East Asia ($437 million).

Figure 1   MENA, South Asia hold greatest export growth potential for Jordan (in $ million value)
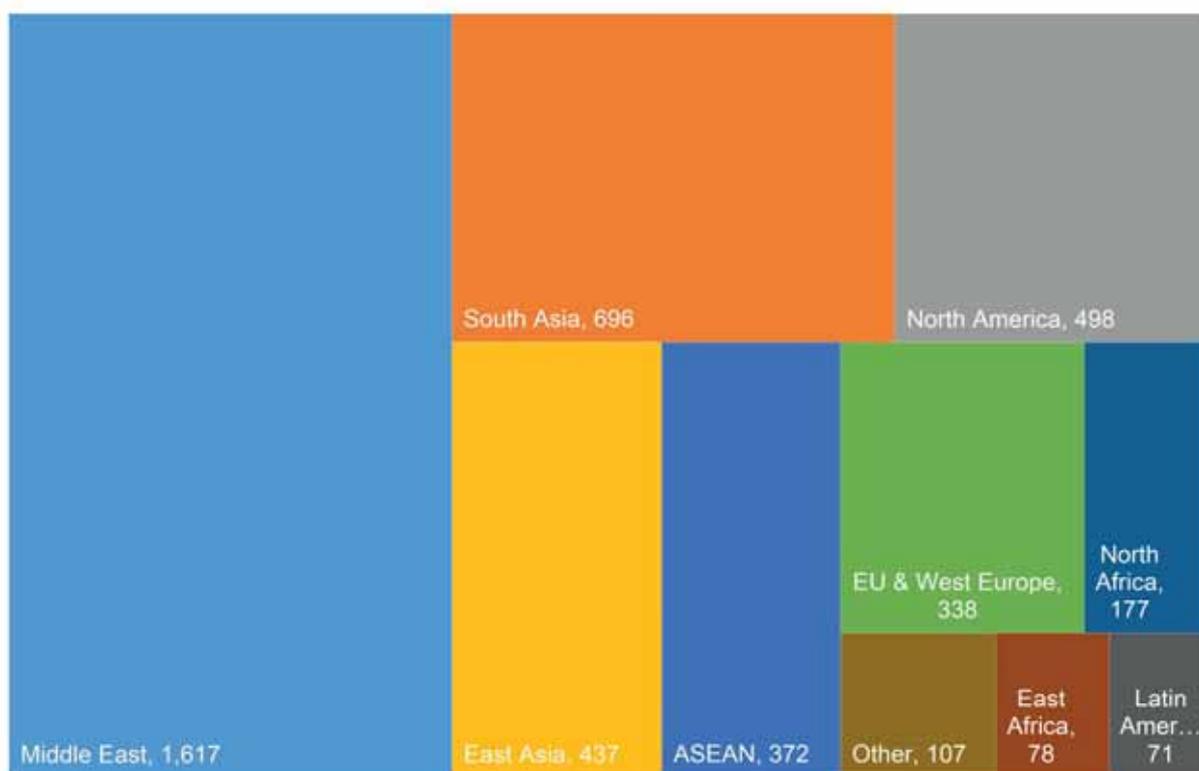
Source: ITC calculations based on Export Potential Map, 2018.

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[13] ITC, 2018.

[14] All trade figures in this paper come from the ITC Export Potential Map dataset that uses five-year averages of a mix of reliable direct and mirror reports for 4,238 HS six-digit-based product groups (for details on the construction of this dataset, see Data Sources).

Within the $1.8 billion export growth potential to the MENA region, the most important sectors are 'live animals' ($448 million, or 25%), 'clothing' ($254 million, or 14%) and 'jewellery' ($153 million, 9%). Together, they account for almost half (48%) of Jordan's untapped export potential.

Figure 2   Live animals, clothing have most export growth potential in Jordan (to MENA in $ million)
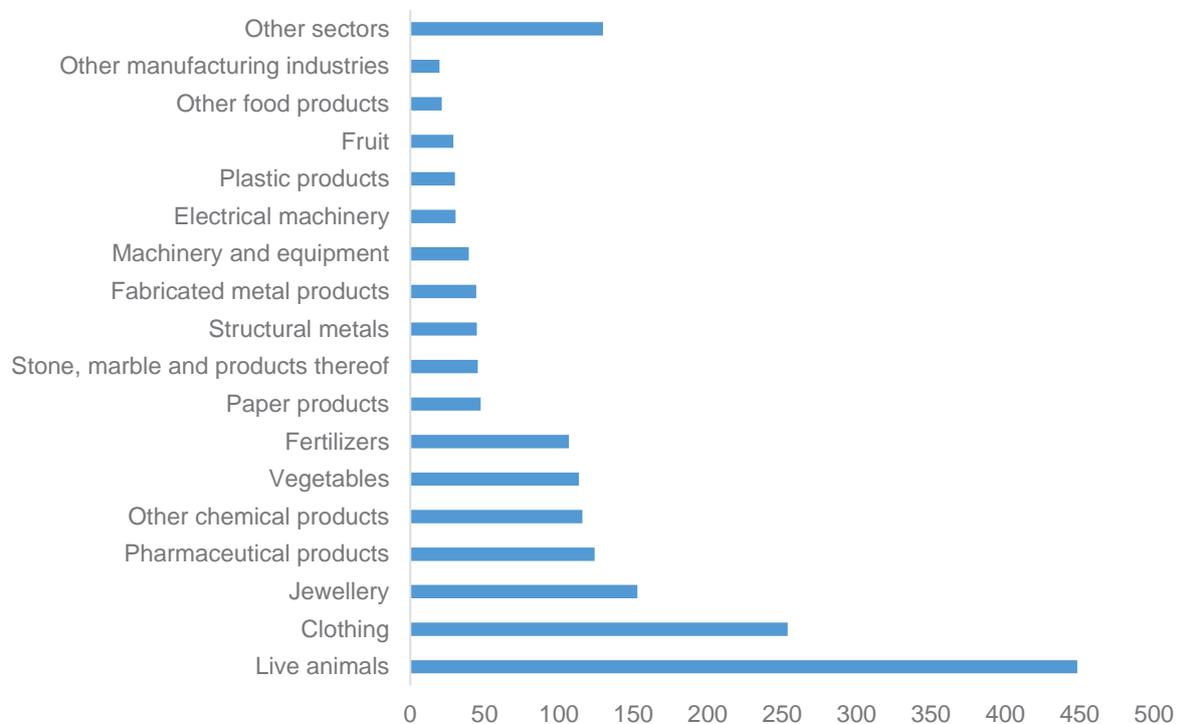
Source: ITC calculations based on Export Potential Map, 2018.

Jordan's employment potential

This section illustrates how many and what type of jobs could be created if Jordan fully realized its untapped export opportunities to the MENA region. All results are calculated using the employment potential methodology discussed above.

Realizing the intraregional export potential for additional employment

Unlocking the regional trade potential could help Jordan create a significant number of jobs. Fully realizing its export potential to the MENA region alone could result in 85,487 jobs,[15] of which about 20,724 would be for women and 64,763 for men.[16]

The sectors with the greatest export growth potential do not necessarily create the most jobs. Figure 3 presents the sector-level correlation between the export growth potential of Jordan to the MENA region and the associated employment creation potential. If each dollar of exports created the same number of jobs, all sectors would lie on the straight line. Sectors above the line create relatively more jobs per dollar of exports, and those below the line create fewer jobs per dollar of exports.

For instance, 'live animals' is the biggest sector in terms of export growth potential, but only second to 'clothing' in terms of employment creation potential. This example shows that export potential alone

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[15] Realizing its export potential to all markets (including MENA) could allow to create 199,858 jobs.

[16] The projection that only about a quarter of new jobs would be taken by women reflects the current relative labour force participation in Jordan, which enters into the computation of the employment effects. The proportion of women among the newly employed could be higher if female labour force participation were to rise following an increased demand for workers.

may not contain enough information to effectively guide policymakers who want to harness exports to advance towards Sustainable Development Goal (SDG) 8, and that it is important to account for each sector's employment creation potential.

Figure 3   Live animals have highest export growth potential, clothing highest job creation potential
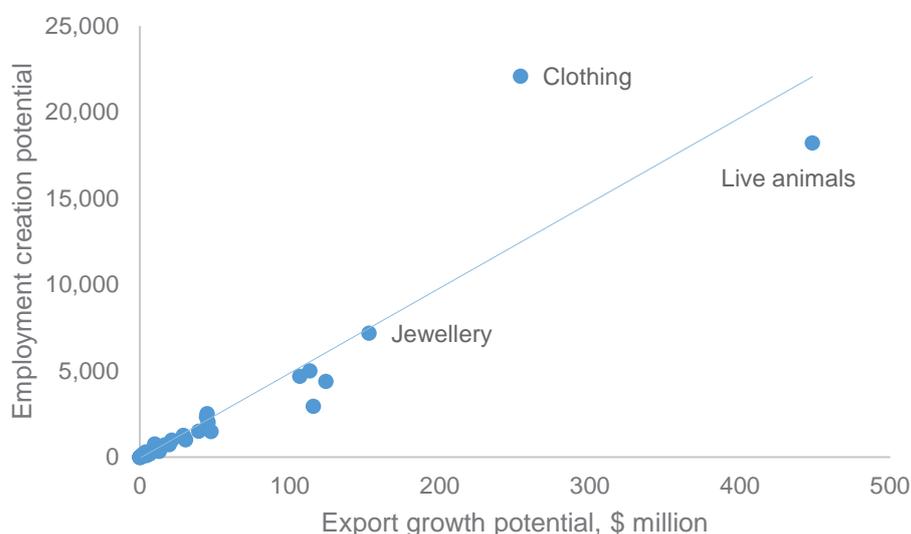
Source: ITC calculations.

Employment potential by export sector

'Clothing', 'live animals' and 'jewellery' have the most job creation potential. Together, they account for 56% of potential new jobs (while 'only' for 48% of the untapped export potential). As shown in Figure 4, 'clothing' has the highest job creation potential (22,097 jobs) and is the only sector with an above-average proportion of jobs held by women (40%).[17] Improving clothing exports may therefore increase employment and encourage female labour force participation, thereby making progress towards SDG 5 (gender equality). 'Live animals' and 'jewellery' would create 18,220 and 7,203 jobs, respectively.

Some of the jobs created by boosting exports would be in the export sectors themselves, whereas others (indirect and induced jobs) would be created across the economy. In Jordan, 31% of the employment potential (26,140 jobs) would be direct jobs (increased employment in the export sector), 27% (23,237 jobs) would be indirect jobs (increased employment in sectors producing inputs to manufacture exports) and 42% (36,110 jobs) would be induced jobs (increased employment in all sectors because of higher consumption).[18]

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[17] For all other sectors, the proportion of jobs held by women among the potential jobs to be created ranges from 7% (wood products except furniture) to 23% (domestic appliances; pharmaceutical products).

[18] Across all sectors, the share of direct jobs ranges from 7% (soft drink beverages) to 80% (wood products except furniture), the share of indirect jobs from 3% (textiles) to 40% (soft drink beverages), and the share of induced jobs between 15% (wood products except furniture) and 69% (optical products).

Figure 4   Clothing, live animals have greatest job creation potential for women in Jordan

■ Job creation potential (female)   ■ Job creation potential (male)
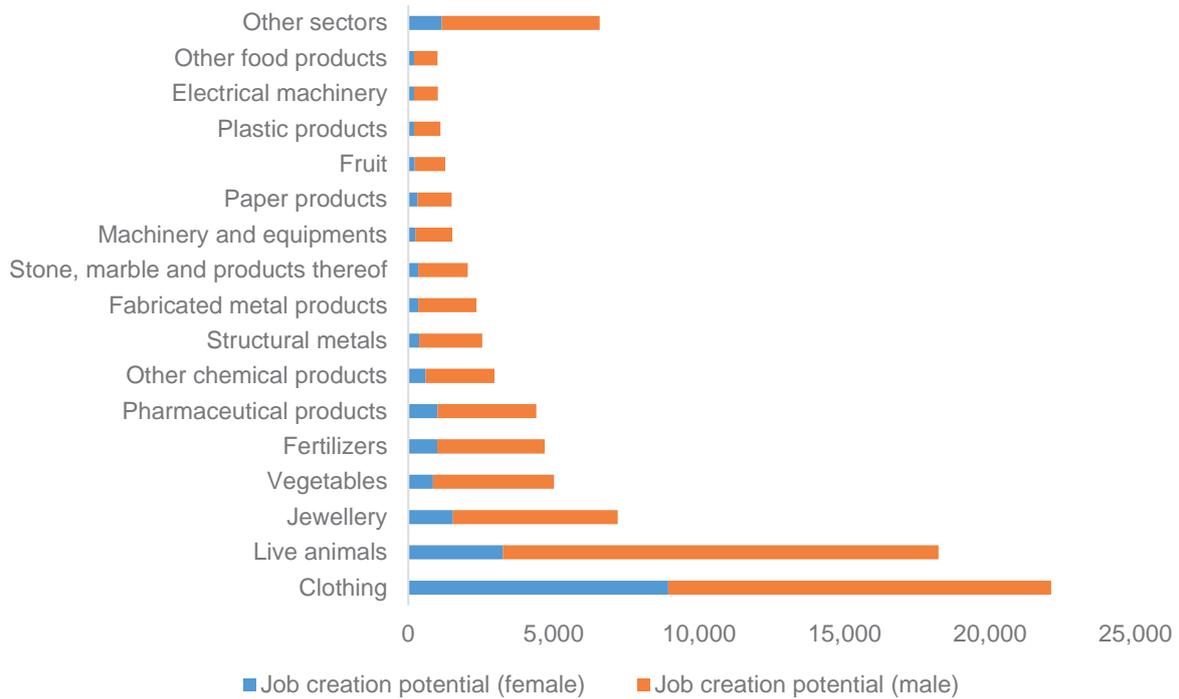
Source: ITC calculations.

Figure 5   Additional clothing exports to MENA region would create most direct jobs

■ Direct jobs   ■ Indirect jobs   ■ Induced jobs
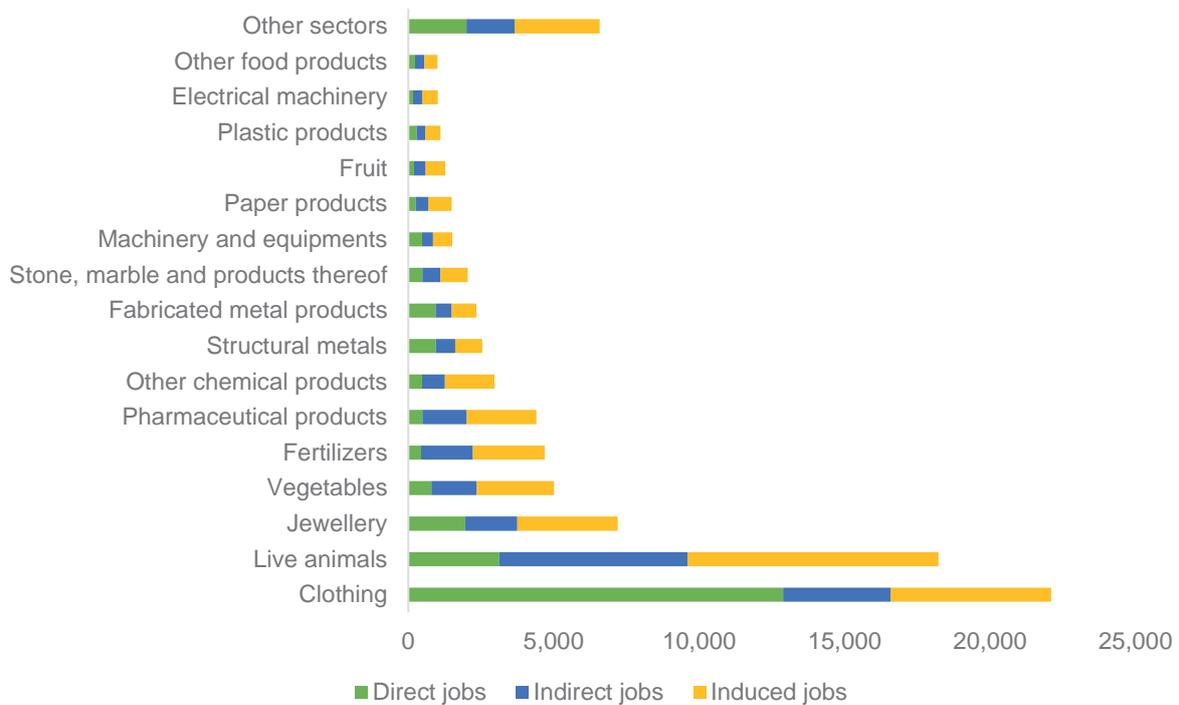
Source: ITC calculations.

Comparing the export sectors with the greatest employment creation potential reveals significant differences in the shares of direct, indirect and induced jobs (Figure 6). Several factors drive these differences:

- The manpower needed to manufacture a product determines the number of direct jobs created when exports increase. 'Clothing' creates many direct jobs because it requires a lot of labour. The labour content of 'jewellery' is rather low and that of 'live animals' is very low, so the number of direct jobs created by exports in these sectors is relatively low as well.

- The number of indirect jobs depends on the share of domestic inputs to production, as well as the labour content in the sectors producing these inputs. The 'clothing' sector imports 31% of its inputs, while the 'live animals' sector imports only 7% and the 'jewellery' sector 18%. This can explain why the share of indirect jobs is much lower in 'clothing' than in the two other sectors.

- Finally, induced jobs stem from additional labour income spent on domestic consumption. Hence, they depend on the number of direct (and indirect) jobs that are created, and the value added per worker in those sectors. Value added is very high in the 'jewellery' sector. Combined with relatively low labour content, this yields a high value added per worker. 'Live animals' has relatively low value added, but labour content is so low that value added per worker remains high. 'Clothing' has an average value added, but very high labour content, so the value added per worker is low. Therefore, 'clothing' creates far fewer induced jobs than 'live animals' or 'jewellery'.

This example shows that considering induced effects helps prioritize export sectors where local value addition and wages are relatively high over those that create many low-paid direct and indirect jobs. Furthermore, the export sectors that help create the most jobs are not necessarily the sectors in which these jobs are created; indirect and induced jobs in other sectors often outnumber those created in the export sector itself.

It is therefore helpful to look at the job creation potential both from the perspective of the export sector that sparks job creation (as done in this section) and from the perspective of the production sector where the jobs are created (which will be done in the next section).

Figure 6   Additional live animal, jewellery exports to MENA would create most induced jobs
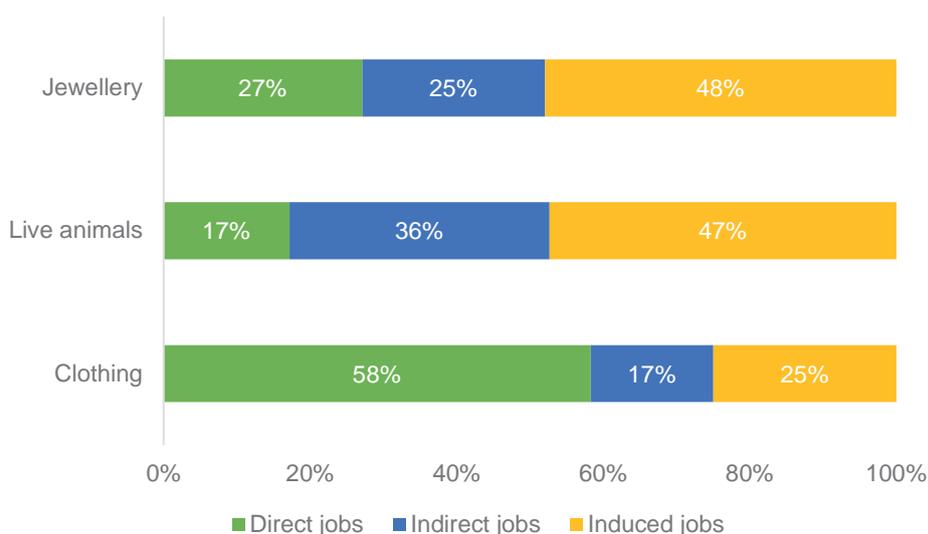
Source: ITC calculations.

Employment potential by production sector

Figure 7 illustrates the production sectors where new jobs would be created if Jordan tapped its full export growth potential to the MENA region. Most jobs (17,444) would be created in 'clothing' – which also creates the majority of jobs across all sectors in the economy. More than half of these jobs (55%) would be for women.

The five next largest production sectors (construction, public administration and defence, education, health services and trade), which together account for 42% of all jobs created through additional exports, are not export sectors themselves. About half of the total employment potential lies in non-traded sectors. This highlights the need to account for indirect and induced jobs to have a comprehensive picture of the job creation potential of additional exports.

Figure 7　　　Clothing, construction would gain most new jobs from additional exports to MENA
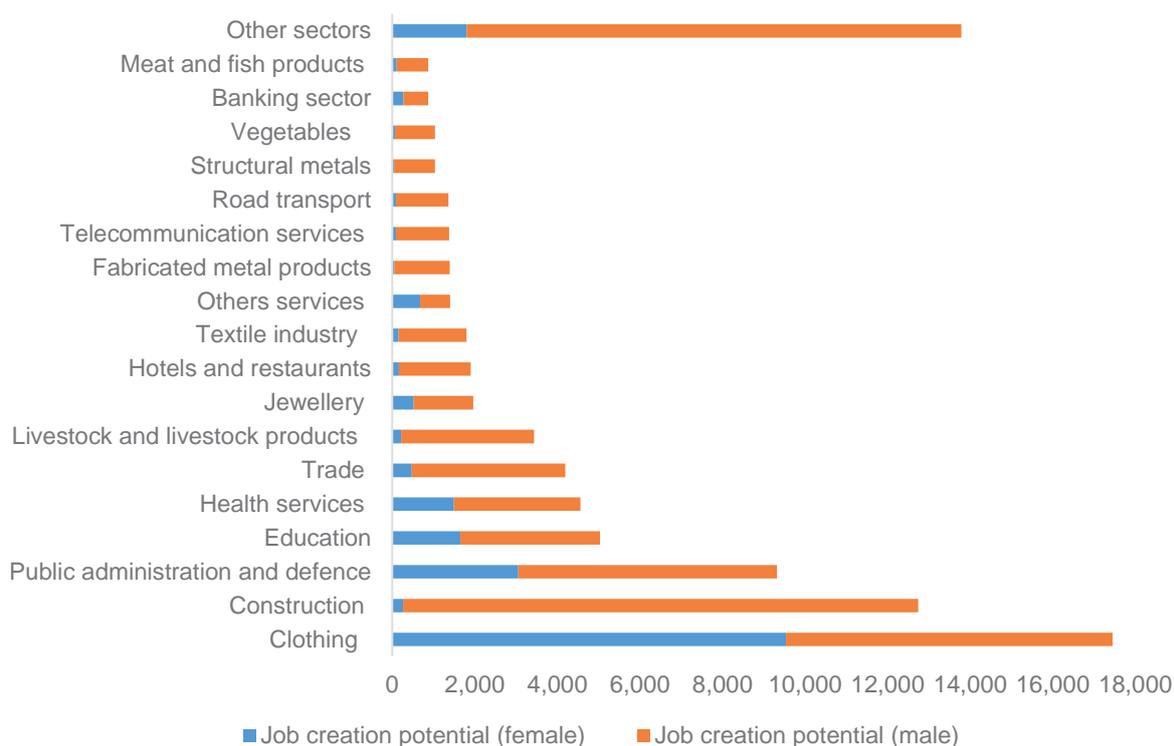
Source: ITC calculations.

Indirect and induced employment creation through clothing exports

'Clothing' is the most important sector for Jordan's regional exports, in terms of creating both direct and indirect/induced jobs. Figure 8 shows indirect and induced job creation by production sector (including 'clothing' itself, in which indirect and induced jobs are created along with direct ones).

Most indirect and induced jobs are created in non-tradable sectors: 'construction', 'public administration and defence', and 'education'. Together, they account for 45% of indirect and induced jobs triggered by clothing exports. 'Clothing' itself is the next most important production sector in terms of indirect and induced employment, because of the intermediate inputs used in this sector.

Figure 8   Additional clothing exports to MENA would create jobs in many other sectors
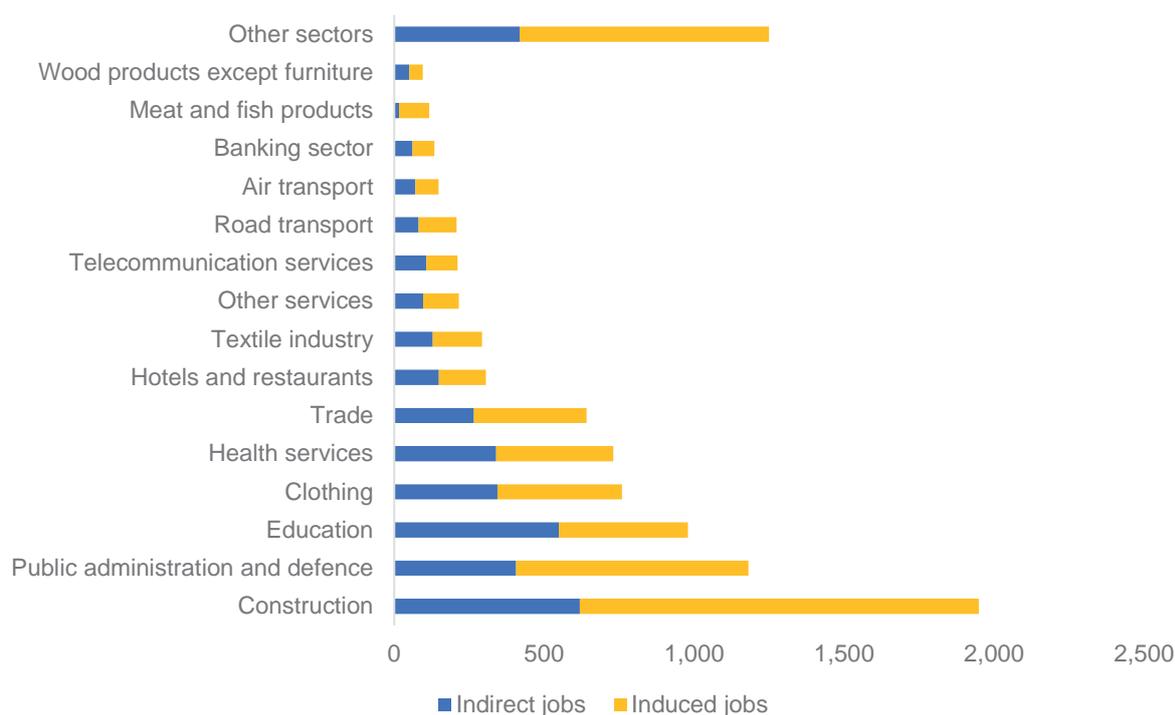
Source: ITC calculations.

Discussion of results

The case study shows that Jordan could create 85,487 jobs by exporting larger quantities of goods to the MENA region. Although 'live animals' has the greatest untapped export potential, 'clothing' has the most potential to create employment. 'Clothing' would also create more jobs for women than any other sector.

After 'clothing', the non-traded production sectors – such as 'construction', 'public administration and defence' and 'education' – would benefit the most from increased exports. These sectors would collectively account for 42% of the new jobs.

As discussed above, the employment potential methodology generates an upper-bound estimate for job creation through increased exports that is more likely to be achieved if the different assumptions are fulfilled. Most importantly, production factors must be available to produce the additional exports.

The relatively high unemployment rate in Jordan, even among university graduates,[19] ensures a general supply of labour. In addition, the low share of women who are working or seeking work implies that another pool of potential labourers may be available once opportunities increase. However, re-training may be necessary if the available skills do not match those needed by the different sectors.[20]

Adequate skills strategies should therefore accompany export promotion activities. It is also worthwhile noting that Jordan is the fourth most water-scarce country in the world.[21] This means producing more particularly water-intensive goods may not be possible, or in the public interest, and that, when possible, water-saving production technologies should be encouraged.

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[19] See, for example, Organisation for Economic Co-operation and Development (OECD) (2018).

[20] For example, half of employed youth did not have qualifications matching their occupation in 2015, most of them being underqualified (OECD, 2018).

[21] World Bank (2017).

Negative macroeconomic consequences should not follow an increase in exports. Jordan has a positive trade balance in services ($2 billion), but this is more than counterbalanced by its negative trade balance in goods ($13 billion).[22] In addition, the Jordanian dinar is pegged to the IMF's special drawing rights.

Increasing exports should not lead to macroeconomic imbalances that would offset positive outcomes in terms of employment generation. Under our modelling assumptions, imports would increase because of greater demand for inputs. But the real exchange rate, and thus the competitiveness of companies in the domestic and foreign markets, should not be affected.

The methodology assumes that the production processes are identical in exporting and non-exporting firms, and that they do not change over time. In the case of Jordan, some export sectors with the highest employment creation potential (see Figure 4) import a significant share of their inputs (31% for 'clothing' and 18% for 'jewellery'). In these sectors, the methodology may overestimate the number of jobs to be created if exporting firms use a bigger portion of imported inputs than non-exporting firms. In other important export sectors, the share of imported inputs is very small (7% for 'live animals', 1% for 'vegetables'), limiting the risk of overestimating job creation in those sectors.

It is useful to consider this assumption for the most important production sectors in terms of employment effects, as the multiplier effects may be considerable. While the first production sector, 'clothing', imports 31% of its inputs, the next five production sectors (see Figure 7) are non-traded, in which there is no difference between exporting and non-exporting firms by definition.

The assumption that production processes (i.e. technical coefficients) do not change over time is generally realistic for material and labour inputs. However, this may not be the case for government-provided services. For example, if an authorization or certificate provided by the government is needed to produce a good, an increase in exports does not necessarily imply that the producing firm must get more authorizations or certificates. This means there may be fewer indirect and induced jobs in the public administration sector than what the methodology suggests.

In the case of Jordan, the assumptions of the methodology are likely to be satisfied to a large extent. While the total number of jobs to be created could still be slightly overestimated, this effect is unlikely to be large, and unlikely to affect the ranking of the sectors with the highest employment creation potential. Among the top sectors, overestimation is most likely to occur for 'clothing', given its share of imported inputs. However, this should not affect the finding that 'clothing' holds substantial potential for job creation given its overall importance (both as export and as production sector).

The way forward

How can Jordan increase exports in sectors that have potential to create jobs? Targeted trade advisory services can help overcome some of the frictions that drive a wedge between current and potential exports.

Some of these frictions are due to difficulties that companies face to comply with the procedures and technical regulations in trade. For example, the ITC business survey on non-tariff measures (NTMs) in Jordan reveals that difficult NTMs in the region especially affect exporters. Members of the League of Arab States are responsible for 93% of the NTMs perceived as burdensome by Jordanian traders.[23] In particular, NTMs may present a barrier to Jordanian exports of 'clothing'.

An ITC study on regional integration among Arab states reveals that NTMs, especially those related to rules of origin and conformity assessments, partially explain the comparatively low level of intraregional trade in the apparel sector.[24] Addressing NTMs and other frictions may therefore unlock considerable export opportunities to the MENA region. To ensure that demand in those markets can be met, policies are needed to make sure the necessary skills for production are available in the domestic labour force.

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[22] ITC Trade Map.

[23] ITC 2018.

[24] ITC 2018.

CHAPTER 4   POLICY IMPLICATIONS

Access to information about untapped export opportunities at the sector level can help government officials and other trade support institutions design policies and strategies to use export development to foster inclusive and sustainable growth and to create decent jobs (SDG 8). The trade-offs they face when picking one sector over another must be evaluated in the specific context of a country's development priorities, levels of human capital development and labour market circumstances (including levels of underemployment and informality), as well as the resources to which the country has access.

Information about the impact of expanding exports on job creation is useful when designing a sound development strategy. In this report, we explain how the employment impacts of increased exports can be estimated in a Keynesian setting. The method allows for distinguishing the impacts across labour categories, including by gender, provided that the necessary data are available. It captures direct effects through the expansion of production of export sectors, indirect effects associated with increased demand for domestically produced inputs, and induced effects stemming from greater consumption.

The case study of Jordan illustrates that the country has an export growth potential of $1.8 billion to MENA region markets. Realizing this export potential could create 85,487 jobs. Of these, 31% are generated directly through increased production in the export sector, 27% indirectly through increased demand for domestically produced inputs, and 42% are induced through increased consumption in all sectors of the economy. About half of the jobs that could be created by boosting exports are in non-traded sectors, such as 'construction' or 'public administration and defence'.

These numbers illustrate the importance of accounting for indirect and induced employment, which is the key contribution of this methodology. Accounting for these linkages helps to prioritize sectors in which local value addition and wages are relatively high.

Another useful feature of the methodology is the disaggregation of jobs by gender or other demographic characteristics (provided the necessary data is available). In the Jordanian case, the analysis shows that 'clothing' has the highest employment creation potential (22,097 jobs) and is, by far, the sector offering the highest share of jobs for women (40%). This type of information can be useful for governments that want to promote employment and generate opportunities for women at the same time.

Assessing the employment creation associated with export potential growth in different sectors helps policymakers choose export sectors to support. As a next step, it is necessary to find out why the export potential is not yet fully exploited in these sectors, and to define strategies showing how governments can help businesses overcome barriers to exports. Targeted trade advisory services can help identify and address some of the frictions that drive a wedge between actual and potential exports.

APPENDICES

Appendix I Computing the direct impact of export expansion

Direct effects describe additional employment in the sector of the final export product. They arise because the extra exports require expanded production, which raises the number of available jobs in the sector.

The direct impact of an export increase on jobs is defined as the impact resulting from a production increase equal to the export increase.

The following variables are specified:

y Production
x Exports
l Labour

Assuming that the economy is divided into n sectors, each variable corresponds to a vector of n components. For instance:

$$y = \begin{pmatrix} y_1 \\ \vdots \\ y_n \end{pmatrix}$$

Direct impacts are thus based on the assumption that:

$$dy = dx$$

Assuming constant returns to scale, employment creation by sector (indexed by i) is proportional to the production increase. It is calculated as

$$dl_i = \frac{l_i}{y_i} dy_i \qquad (1)$$

where $\frac{l_i}{y_i}$ is the labour content of production in sector i. Effects on the employment of specific economic actors, such as women, or on specific age or skill groups can be calculated using the same formula, if employment statistics are available at that level of detail.

Appendix II Computing the indirect impact of export expansion

Indirect effects occur in different sectors, but within the value chain of the final export product. They arise from stronger demand for inputs that are used to manufacture the good for which demand has increased. Producing these inputs again requires inputs, triggering a multiplier effect on production, and therefore also on employment, in different sectors of the economy. The indirect effects of increased exports on employment can be computed using input-output analysis.

Input-output matrices represent inter-sectoral relations. They were formalized by Wassily Leontief for the case of a closed economy (e.g. Leontief, 1986), and later expanded for the case of an open economy by other authors (see, for instance, O'Hagan and Mooney, 1983). The analysis starts from a transaction table that describes how domestically produced or imported goods and services allocate across the different production sectors and final demand (DFD). In some cases, the table is an integral part of a more comprehensive dataset called social accounting matrix.

	Imports	Production	Sector 1	Sector 2	DFD	Exports
Product 1	m_1	y_1	z_{11}	z_{12}	f_1	x_1
Product 2	m_2	y_2	z_{21}	z_{22}	f_2	x_2
Value added			va_1	va_2		
Production			y_1	y_2		

To simplify the analysis, sectors and products are assumed to coincide: each sector produces a single good or service, and each good or service is produced by a single sector.

A new set of vectors and matrices is defined, in which the index i refers to the input sector, while j refers to the output sector.

Vectors

m Imports

v Total intermediate demand

f Domestic final demand (DFD) (for final consumption)

d Domestic demand for domestic products (for final consumption and intermediate inputs)

Matrices

Z Intermediate consumption

A Technical coefficients

Technical coefficients describe the process to produce a good or service. They correspond to the share of input i to the total production value of a good or service in output sector j. Technical coefficients a_{ij} are defined as:

$$a_{ij} = \frac{z_{ij}}{y_j}$$

It implies that the total demand for intermediate inputs from sector i, v_i, equals

$$v_i = \sum_j a_{ij} y_j$$

$$v = Ay \qquad (2)$$

From the table above, the equilibrium in the goods market is written as:

$$y + m = v + f + x \qquad (3)$$

Besides, we assume that all exports correspond to domestically produced goods or services. It follows:

$$y = d + x \qquad (4)$$

The original Leontief model assumes that all inputs are domestically produced. We modify the model by assuming that only a fraction of inputs are produced domestically. The share of imported intermediates $1 - b$ is proportional to the share of imports in the final demand of each sector.[25] This assumption is captured by the following equation:

$$d_i = b_i(m_i + d_i)$$

where m_i are imports and d_i domestically produced inputs used as inputs in sector i. b_i represents the share of domestic intermediates in the production of i.

Defining B as a matrix with the b_i coefficients on its diagonal (and zeroes elsewhere), the relation becomes:

$$d = B(m + d) \qquad (5)$$

Relations (2) to (5) give:

$$\begin{aligned} d &= B(m + d) \\ y - x &= B(m + y - x) \\ &= B(v + f) \\ &= B(Ay + f) \end{aligned}$$

$$(I - BA)y = Bf + x \qquad (6)$$

Assuming that final demand is constant, it follows

$$dy = (I - BA)^{-1}dx \qquad (7)$$

where $(I - BA)^{-1}$ is called the Leontief matrix. dy as specified in (7) captures both the direct and indirect production effects of dx.

Intuitively, how additional exports in one sector translate into additional production in all upstream industries depends on two factors:

- the share of upstream industries' intermediates in the production of the sector (the technical coefficients, A matrix) and

- the share of domestically produced intermediates (B matrix).

All coefficients of the Leontief matrix are positive, and diagonal coefficients are larger or equal to one. This means that the total effect of an increase in exports on production (dy) is always at least as large as the increase in exports (dx).

The effect of exports on production can then be translated into indirect effects of exports on employment using the same approach as above (equation (1)).

$$dl = \frac{l}{y}dy = \frac{l}{y}(I - BA)^{-1}dx \qquad (8)$$

For any increase of exports in a given sector, the method indicates the total number of direct and indirect jobs created in every sector. (To isolate indirect jobs, subtract (1) from (8)). The multiplier effect can be large when production relies on inputs that are produced domestically by labour-intensive sectors. On the contrary, it is small when inputs are mostly imported. Total employment effects are equal to or greater than direct employment effects.

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[25] As compared to the original Leontief model, this formulation leads to less demand for domestic inputs. In practice, exporting companies may be more likely to import their inputs than non-exporting ones, so that the multiplier effect associated with demand for domestic inputs obtained with this formula may still be larger than the actual one.

Appendix III   Computing the induced impact of export expansion

The traditional Leontief approach focuses on the impact of increased demand on production in upstream industries. More production however also generates additional revenues that accrue to households, companies and the government, allowing them to consume and invest more. This rise in consumption demand creates additional demand, and eventually employment, in sectors that are not necessarily in the same value chain as the export sectors. These are referred to as induced effects of exports on employment.

To capture these induced effects, we define an additional set of variables:

q Structure of final demand, components $\frac{q_i}{\sum q_i}$ (share of each sector in final demand)

E   Income elasticity of final demand (a matrix with sector-level elasticities on the diagonal and zeroes elsewhere)

l Share of revenue spent domestically, by sector, components α^w, α^d, α^f

F   Distribution of factor income by sector, components $\frac{w_j}{y_j}$, $\frac{k_j^d}{y_j}$, $\frac{k_j^f}{y_j}$

The vector l captures the share of income spent on domestic consumption, by production factor. w refers to labour, d to domestic capital and f to foreign capital. Domestic and foreign capital can be distinguished to take into account that a smaller share of foreign capital revenue may be consumed locally.[26]

F is a matrix that captures the distribution of value added of each production factor to each sector. The share of income used for local consumption is $l\mathrm{F}y$. When production increases, additional income $l\mathrm{F}\,dy$ is used to consume domestic goods and services.

The coefficients of the $\mathrm{E}q$ vector capture demand elasticities, i.e. how demand in each sector varies with income. In other words, $\mathrm{E}q$ indicates the structure of additional consumption resulting from a unit of additional revenue. To ensure that total demand elasticity equals 1, the sum of coefficients is normalized to 1.[27]

Assuming that the structural parameters in the matrices above are constant, the change in domestic final demand following a change in income is described by

$$df = \mathrm{E}q l\mathrm{F}\,dy \qquad (9)$$

Using equation (6) without assuming constant final,

$$(\mathrm{I} - \mathrm{BA})dy = \mathrm{B}\,df + dx \qquad (10)$$

Combining equations (9) and (10) allows to compute the induced effect of additional exports on production:

$$dy = \left(I - B(A + EqlF)\right)^{-1} dx \qquad (11)$$

dy as defined in (10) includes direct, indirect and induced effects of additional exports on employment.

Intuitively, one can think of the matrix $EqlF$ as an additional multiplier, which captures the demand channel of the impact of increased exports on production. This multiplier also accounts for the fact that additional consumption also triggers additional demand for inputs and additional revenue. While A, the matrix of technical coefficients, can be understood as a 'demand for inputs' multiplier, $EqlF$ can be understood as a 'demand for consumption' multiplier. Each element of the resulting sum captures the additional demand in sector j arising from additional production in sector i, through increased demand for intermediate inputs (A) or increased consumption ($\mathrm{E}qlF$).

The total number of direct, indirect and induced jobs that result from the additional exports is then given by

$$dl = \frac{l}{y}\,dy = \frac{l}{y}\left(I - B(A + EqlF)\right)^{-1} dx \qquad (12)$$

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[26] In practice, data are not always available at the necessary level of detail.

[27] As the consumption data necessary to compute the income elasticity of demand are often not available, we use import elasticities to GDP (estimated from trade data) as a proxy. In line with the gravity literature, these are usually slightly smaller than 1, which is why normalization is required.

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