

# Industrial Development Report 2018

## Demand for Manufacturing: Driving Inclusive and Sustainable Industrial Development Overview



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

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# Foreword



Inclusive and sustainable industrialization is essential to achieve sustainable development. It unleashes dynamic and competitive economic forces that generate employment and income, facilitate international trade and enable efficient use of resources.

As such, it is a major driver of poverty alleviation and shared prosperity.

The Industrial Development Report (IDR) series is an established source of reference on industrial development. Previous editions have been examining the driving forces of industrialization and the positive factors that can lead to social inclusiveness and environmental sustainability. They have examined crucial components of the production side of industrialization, such as capacity building, energy efficiency, employment creation and technological change, to mention just a few.

This 2018 edition of the IDR complements previous reports by shedding light on a dimension of industrial development that has still been unexplored: the consumption of manufactured goods. Understanding the consumption side is essential to fully grasp the drivers and impact of industrialization. On the one hand, industrialization cannot take place unless there is sufficient demand for new products. We thus need to understand the determinants of manufacturing consumption. On the other hand, industrial development can bring important benefits to consumers, and can thereby significantly improve their living standards and well-being. We need to better comprehend how to improve the positive impact on consumers.

This IDR, for the first time, provides a framework that captures the interactive nature of manufacturing consumption and industrial development, supported by empirical evidence. The report shows that,

under the right conditions, the consumption of new products can set in motion a virtuous circle of industrial development, demand diversification and income creation.

By placing demand at the centre of attention, this year's IDR acknowledges the role of manufacturing industries as major providers of new and improved goods. Since the first industrial revolution, manufacturing has changed our lives in a radical way. Many activities of our daily lives would have been impossible to imagine without the technological breakthroughs in manufacturing—from the introduction of cars and washing machines to the distribution of computers and, more recently, smartphones and 3D printers. In all these cases, new products were first introduced to the market at high prices, affordable only for a few. But the continuous process of innovation and competition has been making them affordable for more and more households around the world.

UNIDO's vision is that no one should be left behind in benefiting from industrial development and that the prosperity it creates should be shared among all people in all countries. As the report highlights, for this to happen, countries need to be involved in the process of industrialization. This requires building industrial capabilities to serve new and more sophisticated demands from consumers. Moreover, the incomes generated in the virtuous circle of consumption need to be distributed evenly across households in individual countries. An important finding of the report is that the expansion and strengthening of middle classes is a powerful driver of domestic demand for new products and industrial development.

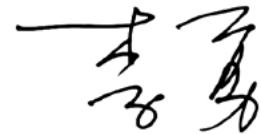
In addition, industrial development needs to take place in an environmentally sustainable manner. Increased consumption of new products can add pressures on the environment. These pressures can be mitigated through environmental interventions in manufacturing industries that lead to the production of environmental goods: that is, goods that minimize the

use of natural resources and toxic materials, as well as the emissions of waste and pollutants. The technology for cleaner industrial production already exists, and “green industries” can be promoted to deliver environmental goods and services. A key message of the report is that the development of these industries requires major shifts in the consumption patterns towards the purchase of environmental goods. Important barriers need to be removed to allow widespread consumption, including too high prices, gaps in consumer awareness of environmental concerns and biases in purchasing behavior.

Several policy tools that focus specifically on the demand for manufactures can support an inclusive and sustainable industrialization process. Demand can be considered as a framework condition, partially or completely outside the control of policy-makers, or as an actionable variable in industrial policy interventions. In either case, governments can assume distinct

roles and actively engage with the private sector and other stakeholders, thereby acknowledging the role of the private sector as a driver of industrialization.

It is a great pleasure for me to present this report. I am delighted that *Industrial Development Report 2018* adds a consumption dimension to the analysis of industrial development. This report reaffirms the commitment of UNIDO in supporting the achievement of inclusive and sustainable industrial development. I am grateful to the UNIDO team and our international experts for producing this timely report, which displays our added value towards sustainable development.



LI Yong  
Director General, UNIDO

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# Technical notes and abbreviations

References to dollars (\$) are to United States dollars.

Annex 1, Tables A.1.1 and A1.2 list all economies by region and industrialization level.

*Components in tables may not sum precisely to totals shown because of rounding.*

<b>CIP</b>	Competitive Industrial Performance
<b>FDI</b>	Foreign direct investment
<b>GDP</b>	Gross domestic product
<b>ICT</b>	Information and communications technology
<b>IDR</b>	Industrial Development Report
<b>LDC</b>	Least developed country
<b>MITT</b>	Manufacturing income terms of trade
<b>MVA</b>	Manufacturing value added
<b>PPP</b>	Purchasing power parity
<b>SDG</b>	Sustainable Development Goal
<b>UNIDO</b>	United Nations Industrial Development Organization



# Overview

## Demand for manufacturing: Driving inclusive and sustainable industrial development

### Key messages

#### *Spinning the “virtuous circle”*

Industrial development has typically been studied from a supply-side perspective, ignoring the importance of demand. The initiation of industrial development, however, requires a critical mass of demand for manufactures. With the right set of conditions, the consumption of manufactures can set in motion a virtuous circle of industrial development comprising income creation, demand diversification and massification of consumption (Figure 1).

Initially, as income grows, demand shifts from necessities to more sophisticated goods. If enough industrial capabilities are in place, this diversification can be a powerful driver of industrial development through the emergence of new industries. The expansion and

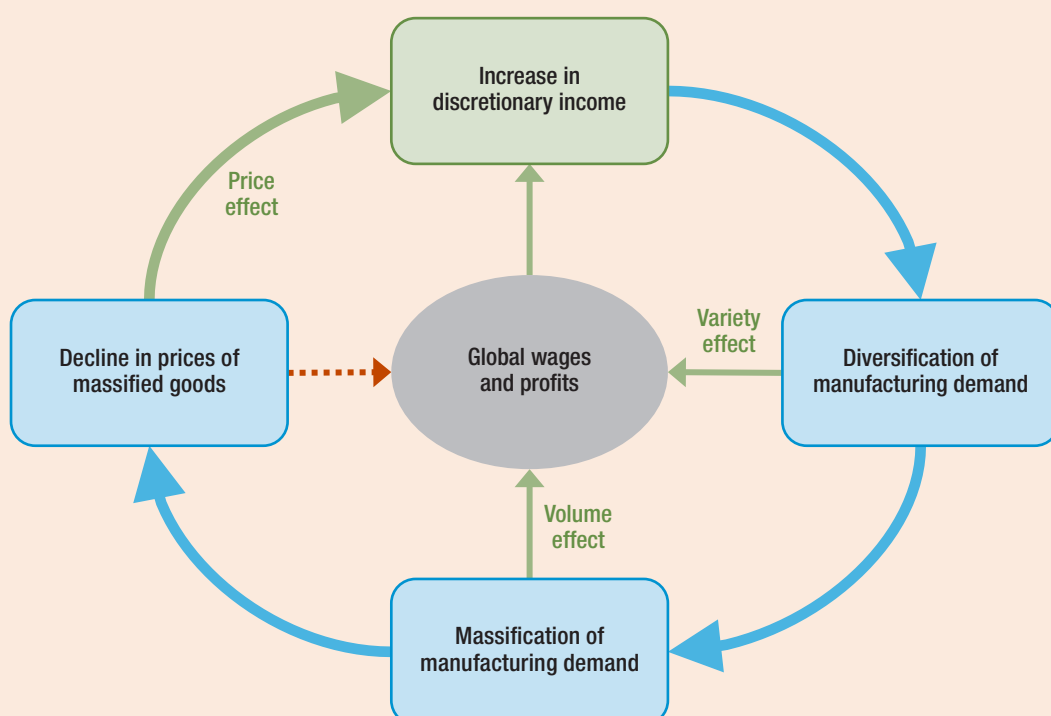
consolidation of manufacturing industries, in turn, lead to increases in production efficiency and reduction in prices, which enable a broad-based diffusion of manufactures through mass markets. Further increases in production efficiency improve the purchasing power of all consumers, which create new disposable incomes—and keep the circle turning. Around this circle, industries emerge and disappear, and new sources of income are created for consumers, workers and entrepreneurs.

#### *Capturing income from domestic and foreign demand*

For the virtuous circle to work, a critical mass of income needs to be generated within individual economies—and this income should be well distributed. Gains going to the top 1 percent will not keep the circle virtuous.

Figure 1

### A virtuous circle of manufacturing consumption and industrial development



Source: UNIDO elaboration.

## “ Studying manufacturing from the perspective of demand offers a more empirically grounded understanding of the sector’s evolution and current state

In a globalized economy the income generated depends on who serves the final demand for manufactures and how. To benefit from the circle, countries need to capture income from both domestic and foreign demand.

Another critical mass—of industrial capabilities—needs to be reached so that domestic producers can serve increasingly sophisticated demand from consumers, nationally and globally. The upshot? Prices for new varieties of manufactures decline as production efficiency increases.

### *Distributing the gains inclusively and pro-environmentally*

The circle of consumption does not guarantee socially inclusive and sustainable outcomes. Such inclusiveness—equal opportunities to contribute and benefit from industrialization—requires that income flow to the poorest in society, increasing welfare at the “bottom of the pyramid.”

Increased consumption also intensifies environmental impacts, through higher pollution, overuse of natural resources and creation of waste. Technological innovations and “massified” environmental goods are key to addressing this challenge and rendering the virtuous circle environmentally sustainable.

### *Meeting the Sustainable Development Goals*

The emergence and diversification of mass markets for manufactured products incentivize a process of continuous innovation. They also call forth the provision of infrastructure, from improved transport links to optical fibres, to better serve these mass markets. New industrial sectors emerge and expand, generating new jobs and profit opportunities. If it is made inclusive and sustainable, the circle is an important catalyst for achieving Sustainable Development Goal (SDG) 9 (“Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”). At the same time, industrial development improves the welfare of consumers by providing new varieties and qualities of goods that become affordable to everyone, potentially helping achieve other SDGs.

### *What governments can do*

Governments can encounter demand as a “framework condition” (about which they can do little) or as a “policy-actionable variable” through which they can help exploit the opportunities created by manufacturing demand to drive industrial development, making this process socially inclusive by shifting incomes towards the poorer segments of society and environmentally sustainable by encouraging massification in the consumption of environmental goods.

## **A new perspective: Demand**

### *The traditional approach to studying industrial development has ignored demand*

Industrial development has been studied largely from the production side, with little focus on demand variables or their interaction with supply. If they are to diffuse successfully, new or better products must meet consumer demand.

Policies and the academic literature emphasize the productive assets needed for industrial development—including entrepreneurial and technological capabilities, labour skills, quality of resources and good infrastructure—neglecting demand-side variables and policy tools. This report seeks to plug this gap. How does industrial development improve living standards (Chapter 1)? How does demand drive industrialization, nationally and globally (Chapters 2–4)? How can consumption be made sustainable (Chapter 5)? What can governments do to harness shifts in demand patterns (Chapter 6)? How are these trends reflected in production patterns and competitive performance across regions of the world (Chapters 7–8)? Studying manufacturing from the perspective of demand offers a more empirically grounded understanding of the sector’s evolution and current state.

### ***Bringing affordable variety for all***

### *Manufacturing is not losing its significance*

Recent global trends have led some observers to (erroneously) conclude that manufacturing is no

## What matters for consumers is the creation of new manufactures that become better and cheaper over time

longer a key sector of the economy. A popularly held view is that manufacturing's importance has been shrinking over the last few decades, in line with the emergence of the "post-industrial" society. The empirical evidence used to substantiate this claim is typically based on the nominal value added produced in manufacturing industries as a share of nominal gross domestic product (GDP). At first glance, both at the global level and among specific country groups, the value of manufacturing production has declined relative to other sectors, suggesting a process of deindustrialization.

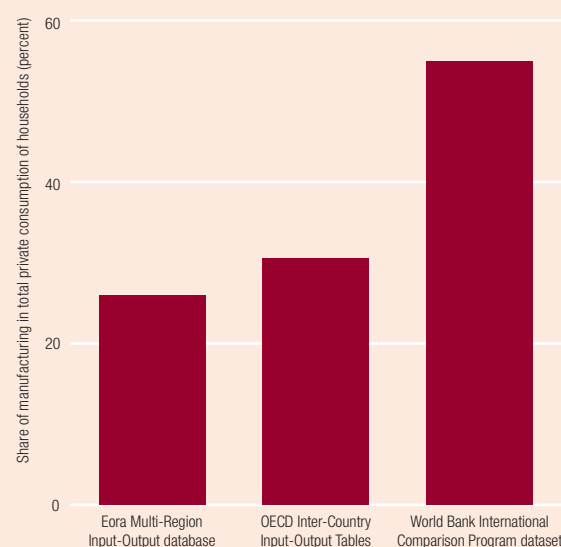
This conclusion, however, is driven by the production angle. When demand is placed at the centre of attention, other features become as important. What matters for consumers is not the share of manufacturing in nominal GDP but the creation of new manufactures that become better and cheaper over time. The empirical evidence presented in this report highlights the importance of manufacturing in providing an increasing variety of goods at prices that decline relative to those in other sectors of the economy—providing "affordable variety for all."

### *From a consumer perspective, the importance of manufacturing has increased over the past 25 years*

One way of analysing the importance of manufacturing from the consumer angle is to look at its share in GDP when prices are kept constant, to provide an indication of changes in the quantities of goods manufactured. From this perspective, the sector's contribution to real GDP increased over the past 25 years. When one looks at the share of manufacturing keeping prices constant at the 2010 level, there is no evidence of global deindustrialization. On the contrary, between 1991 and 2014 the share of manufacturing in real GDP increased, from 14.8 to 16.0 percent (see

1. The first and second bars in the figure are based on national account statistics, while the third bar is based on household expenditure surveys. That explains the large differences between sources. National accounts-based statistics include an imputation for the "consumption" of household services that is not present in expenditure surveys and hence reduces the share of manufacturing goods. Differences also exist in the sectoral disaggregation used. National accounts use industry-based classification while household surveys use consumption specific classifications. In the latter the definition of manufacturing is not straightforward and does not match exactly with the industry-based classification. This report uses a classification put forward in Duarte (2017).

Figure 2  
**Manufacturing: A key provider of goods for private household consumption**



Note: All values are for 2011 and in current \$. Values are unweighted averages of all countries included in each source. In the World Bank International Comparison Program dataset, manufacturing consumption is defined following the approach put forth in Duarte (2017) (see Annex 2, Table A2.1). Source: UNIDO elaboration based on the Eora Multi-Region Input-Output database (Lenzen et al. 2012; Lenzen et al. 2013), OECD (2017) "Inter-Country Input-Output Tables, 2016 edition," [oe.cd/icio](http://oe.cd/icio), (accessed on September 6, 2017) and the 2011 International Comparison Program dataset (World Bank 2015).

Chapter 1, Figure 1.5). Values are unweighted averages of all countries included in each source.

### *Manufacturing accounts for the bulk of consumption expenditures...*

The importance of manufacturing from a demand perspective is not confined to its share of GDP. It also plays a key role as a provider of goods, a point that stands out clearly in final consumption statistics. Most of the items people consume daily are produced by manufacturing. As data from household expenditure surveys reveal, on average more than half of the world's consumption spending goes to manufactured goods (Figure 2).<sup>1</sup>

## “ Interactions between demand and supply enable the diffusion of new, better and ever cheaper goods for consumers

### *...and consumption is a major driver of industrial development*

Industrial development does not occur in a vacuum. It can take place only if there is sufficient demand for manufactured goods. Consumers thus play a key role in the emergence and consolidation of manufacturing sectors. Domestic consumption is a key component of demand, but external demand—through exports—is also important for industrial development.

### **Interactions between demand and supply**

#### *Industrial development, demand diversification and income creation interact strongly*

For a new manufactured good to be introduced to the market, demand is needed. A high initial price and few applications render a good accessible only to high-income households. As the sector consolidates and gains scale, prices fall, making the good affordable to more consumers. With enough demand in place, the good becomes mass consumed—“massified”—allowing for further exploitation of scale economies, the entry of new firms, greater competition and further declines in prices. This interactive process between demand and supply enables the diffusion of new, better and ever cheaper goods for consumers alongside the expansion and development of new sectors and related providers.

#### *Computers and other goods exemplify these interactions*

When introduced, computers were so large and expensive that almost no individual could afford one. Only after the invention of the micro-processor in the 1970s could computers become “personal.” They still remained a niche market, however. By the 1990s, after two decades of rapid technological progress, continual quality improvements and declining production costs, computers had become essential tools at home and work. Similar trajectories are seen in the life cycle of other manufacturing durables, such as washing machines, cars, telephones and televisions.

### *Technology strengthens the interactions between demand and supply*

In this interplay of demand and supply, innovation is not limited to creating new products and improving existing ones. Innovation is also required to reduce transactions costs, enabling producers to reach their target markets. Improved airfreight, shipping containers and modularity are a few of the innovations that accelerated the flow of goods to markets in the past, helping their diffusion. Today, information and communication technologies (ICTs) allow firms to tap into previously inaccessible sources of demand by establishing an instantaneous connection with consumers.

### **The virtuous circle of industrial development: Creating income, diversifying demand and massifying consumption**

#### ***The relationship between consumer demand and industrial development***

##### *As incomes grow, demand diversifies away from necessities towards other goods and services*

Shifts in consumption patterns and shifts in the composition of the economy are inter-dependent. As income rises, the budget share households allocate to necessities and basic goods declines—a relationship known as Engel’s Law (Figure 3). Demand shifts from food and other necessities towards increasingly sophisticated products and services, providing new opportunities for sectors to emerge.

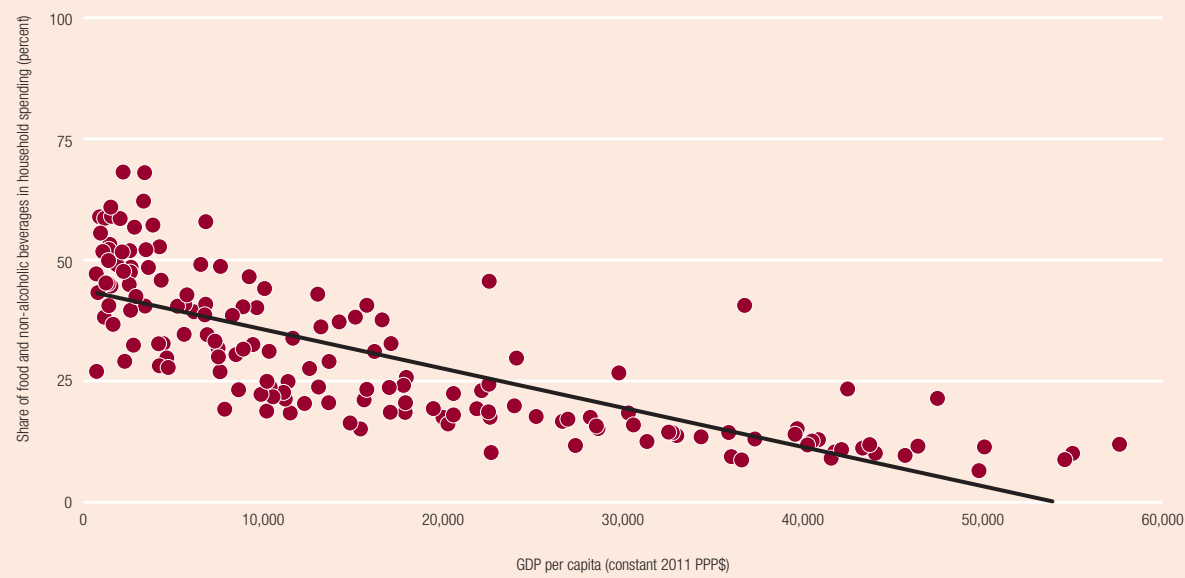
##### *Some goods are luxuries, others necessities*

Not all manufactured goods respond to changes in income in the same way. Demand for some goods increases more than proportionally as income rises; they are known as “superior” or “luxury” goods. Demand for other goods increases less than proportionally; they are known as “inferior” goods or necessities.

Income elasticities—the change in consumption that occurs when income rises by 1 percent—illustrate this distinction. Products such as cars, motorcycles and jewellery are typically classified as superior goods,

**“A salient feature of successful manufactures is their broad-based diffusion across households and global regions”**

**Figure 3**  
**The share of household spending on food declines as income rises**



*Note:* All values are for 2011. GDP is gross domestic product and PPP is purchasing power parity. Classification of food and non-alcoholic beverages consumption is based on Annex 2, Table A2.1. *Source:* UNIDO elaboration based on the 2011 International Comparison Program dataset (World Bank 2015) and World Development Indicators (World Bank 2017).

because their elasticity tends to be greater than 1. In contrast, pharmaceuticals, clothing and footwear can be considered necessities, because their average elasticity is less than 1.

*Whether a good is a luxury or a necessity varies by income levels of countries and over time*

The response of different manufactured goods to changes in income depends on consumers’ location and socioeconomic status; it also changes over time, reflecting different stages of the life cycle of manufactures. Within a country, the same product can be a luxury for the lowest-income segment and a necessity for the highest-income segment. Over time, goods introduced at high prices and accessible only by high-income households can become necessities, as innovations reduce their prices and broaden their applications.

*Demand massifies when luxury goods accessible only to a few households turn into necessities and are consumed by all*

When luxuries turn into necessities that the vast majority of households can afford, they are said to

“massify.” A salient feature of successful manufactures is their broad-based diffusion across households and global regions (Figure 4). The diffusion of most goods follows the traditional S-shaped pattern: At first, only a few individuals adopt the new good, but soon diffusion begins to climb, as more and more households adopt it. The rate of adoption then begins to level off, as fewer and fewer households remain that have not adopted the product. Eventually, the S-shaped curve reaches its asymptote. The good has become a mass product.

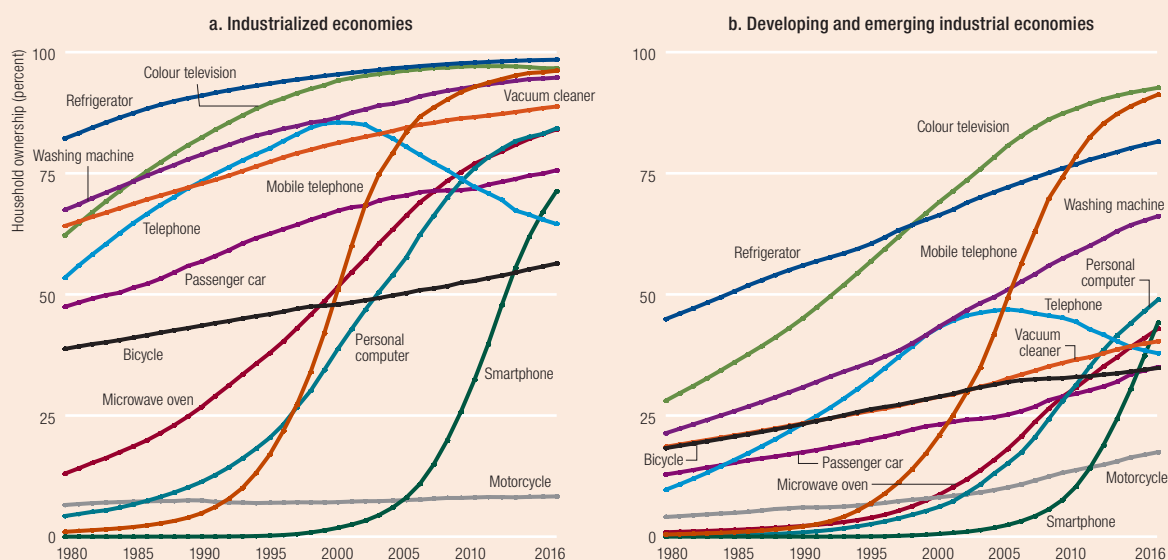
*After a certain point, demand tends to satiate, driving structural change*

An important feature of demand is the tendency to satiate—to reach the point at which household expenditure ceases to rise in response to increases in income. Satiation is crucial in driving structural change from the demand side. The slowdown in demand growth causes resources to shift from sectors supplying goods for which demand has satiated towards new sectors that produce goods for which demand has not yet been satiated.



## Central to the process of demand diversification and massification is the growth of the manufacturing sector

Figure 4  
Over the past decades, household consumption of durable manufacturing goods has spread at an increasing rate around the world



Note: Industrialization level classification is based on Annex 1, Table A1.2.  
Source: UNIDO elaboration based on Euromonitor International (Economies and Consumers; Possession of Household Durables, 2016).

### Why industrial development is important

#### Industrial development plays a key role as a prime provider of new goods

Central to the process of demand diversification and massification is the growth of the manufacturing sector. Manufacturing firms are the key providers of new goods and increased variety within any economy. People's daily lives have been radically transformed by successive waves of technological revolutions, all initiated in the industrial sector. These waves significantly increased the set of goods available for consumers—and continue to do so today.

#### Thanks to advances in productivity, competition and innovation, these goods tend to become less and less expensive...

Underlying all industrial revolutions, from the first until today's fourth, is a process of continuous price reduction, enabled by productivity gains, product and process innovation and competition in product markets. Output prices in manufacturing display a

systematic downward trend relative to prices in all other sectors in the economy, fundamentally influencing the weight of manufacturing in national accounts. As a result, the sector is on the decline in nominal terms but not in real terms. The tendency towards falling relative prices lies at the heart of the industrial sector and reflects its inherently higher potential for productivity growth relative to agriculture or services. Continuous increases in productivity are passed on to consumers in the form of lower prices, stimulating further demand and allowing firms to invest in expanding production and employment (Figure 5).

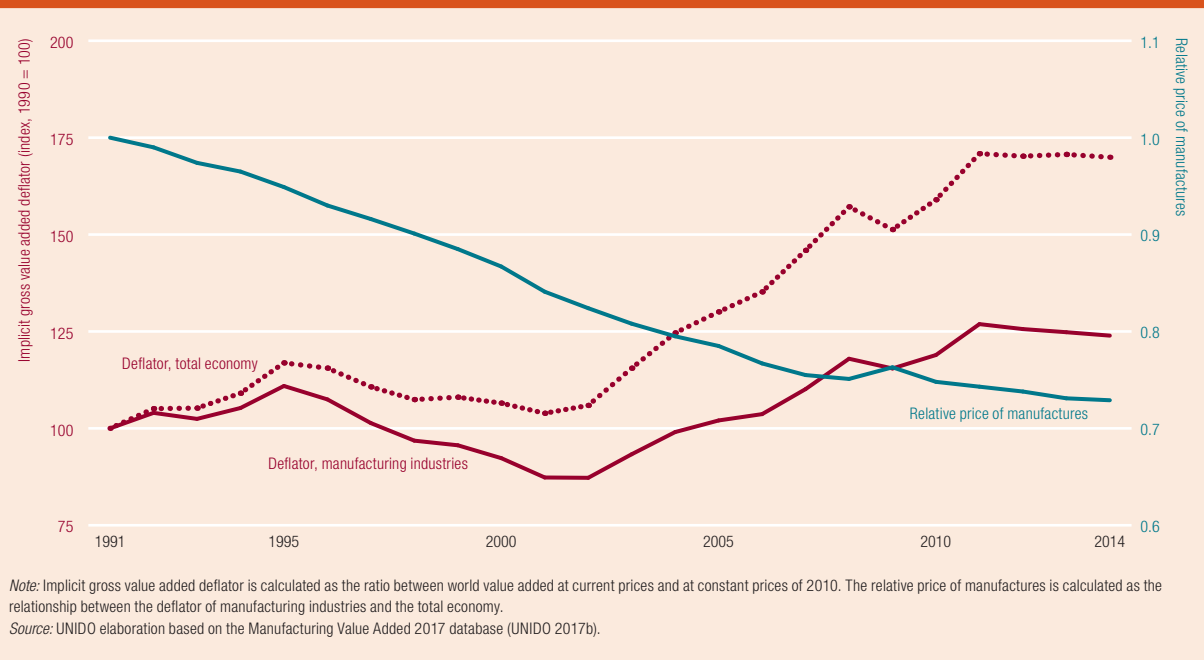
#### ...and can therefore be massively consumed

As a result of the fall in prices, demand for manufactures massifies. Technological innovation and mass production are therefore intertwined. Process innovations reduce production costs, enabling producers to tap into mass consumption markets. Mass production facilitates further process innovations by increasing learning-by-doing and specialization benefits. There is an iterative causality between productivity

## As income grows, discretionary income leads to demand for new products, which spurs manufacturing firms to engage in production

Figure 5

Relative price of manufacturing in decline compared with the global economy



improvements in manufacturing and the rise of a mass consumption society: As productivity improves, the price of consumer goods falls, generating larger markets, inducing further improvements in productivity and creating a virtuous circle of productivity gains and expanding markets.

### *This causality can be illustrated as a virtuous circle*

An increase in the discretionary income at the disposal of consumers—thanks to lower prices and increased earnings—sets in motion a series of interrelated effects that foster income gains and welfare through the consumption and production of manufactured goods (Figure 6). Along the circle new sources of income are created for consumers, workers and entrepreneurs.<sup>2</sup>

Until the end of the 19th century, most people allocated the largest share of their income to necessities. The acquisition of more sophisticated goods and

services required discretionary income. Only with the greater efficiency of production brought about by the first industrial revolution could ordinary people start to accumulate income beyond what was necessary for basic sustenance. Improved efficiency, with the increasing income created by new sectors from investment and wages, explains the creation of discretionary income, which leads to the process of growing product quality and differentiation. How does the circle work?

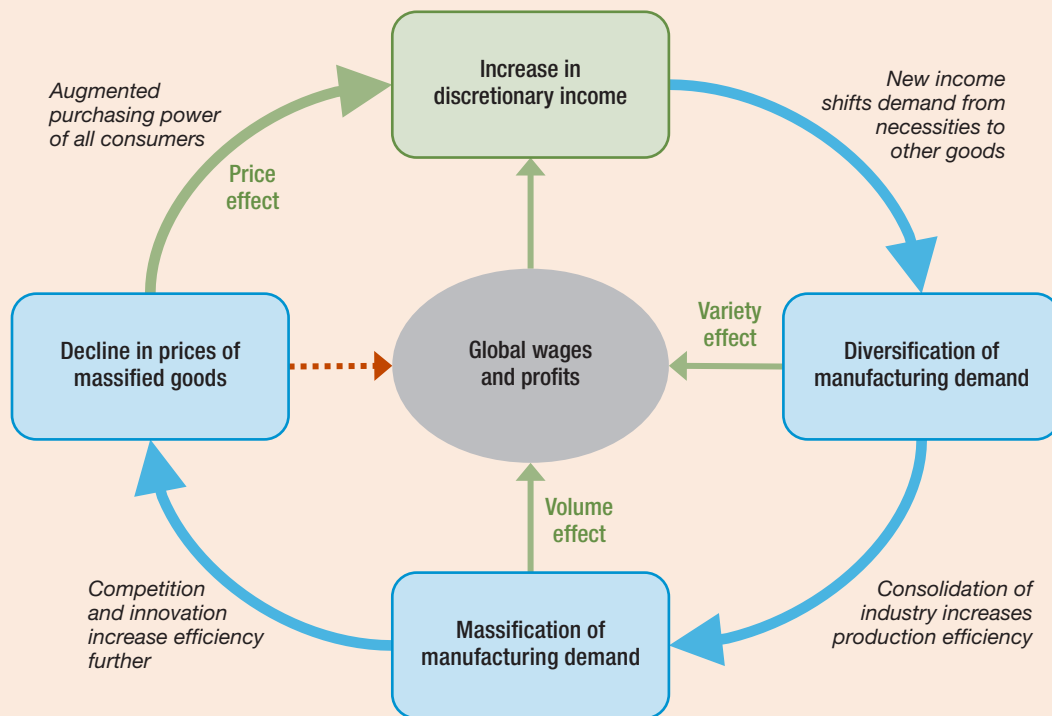
### *Increases in discretionary income lead to demand diversification and the creation of new industries that provide a greater variety of products*

An increase in discretionary income leads to diversification of demand away from necessities towards other goods, creating new opportunities for the emergence of new sectors. As income grows, necessities are more easily satisfied, and part of the new income—discretionary income—is allocated to other types of expenditure. When demand for a new product increases to a sufficient scale, it spurs manufacturing firms to engage in production of the product. Investment shifts towards the emerging sectors,

2. The conceptual underpinnings of this circle are rooted in well-established contributions from the specialized literature including Foellmi et al. (2014), Kaldor (1967), Matsuyama (2002) and Saviotti and Pyka (2013).

“ With firms now able to pass productivity increases on to consumers, luxuries turn into necessities affordable by yet more households

Figure 6  
The virtuous circle of manufacturing consumption: The global economy



Source: UNIDO elaboration.

increasing variety in the economy and improving the nominal income of those workers and entrepreneurs directly and indirectly involved in the new production (the “variety effect”).

*Increased production efficiency in new industries reduces prices and enables demand massification, opening new opportunities for producers*

As emerging manufacturing industries consolidate, they gain scale and increase efficiency, through process and managerial innovations. Manufacturing industries appear to grow in a cumulative fashion: The continuous expansion of production leads to further improvements in efficiency, reflecting learning dynamics. This expansion accelerates the growth of productivity within the sector and the economy as whole. When productivity increases as a result of economies of scale, as well as advances in technology and organization, production costs decrease, reducing the prices

of goods that had once been affordable only by a few. With firms now able to pass productivity increases on to consumers in the form of lower prices, luxuries turn into necessities affordable by yet more households. Demand for these products becomes massive, and new income opportunities are created for firms serving the new sources of demand (the “volume effect”).

*Further increases in production efficiency reduce prices even more, increasing the purchasing power of all consumers and lifting discretionary incomes*

The process of production efficiency gains does not stop there. Even when goods have diffused among all consumers, inter-firm competition, alongside the constant introduction of innovations, leads to further gains in production efficiency and price declines. This reduction in prices now affects the vast majority of consumers, including the early and late adopters of the new goods. The purchasing power of all consumers

## **“ Affordable variety contributes to increasing consumer welfare across all segments of society**

increases (the “price effect”), as does the discretionary income they can allocate to new varieties of non-essential manufactured goods, restarting the circle once again. It is this process of continuous diversification of demand over time that gives impetus to the emergence of new industries and the creation of new varieties of goods—a key requirement for sustaining economic development over the long term.

### **How consumers benefit from the virtuous circle**

#### **Affordable variety and consumer welfare**

*Manufacturing creates affordable variety for all and helps create the income needed to purchase these items*

The most visible result of the virtuous circle is that a continuous stream of products—some radically new and initially expensive, others increasingly affordable improvements on previous innovations—reaches the vast majority of consumers. New goods and a greater variety of products transform the physical environment, as well as habits and social relations. New income is generated via direct and indirect channels, through the combined effects of greater variety and volume and the decline in relative prices. Affordable variety contributes to increasing consumer welfare across all segments of society.

*Cheaper and better goods improve consumers’ welfare...*

The introduction of a new good can be considered an important source of consumer welfare. The polio vaccine, frozen food and personal computers are a few examples of new goods that raised life expectancy and productivity. The decline in prices and improvement in quality of these goods constitute major sources of welfare for consumers. Subject to technological progress in industry, prices for consumer goods have experienced a long-term downward trend over the past century that has contributed to an unprecedented improvement in consumers’ purchasing power and welfare.

*...and broaden their set of choices, creating more variety in the economy*

Closely related to welfare gains from new goods and price reductions is the increase in variety. Recent research finds that access to a wider variety of imports increased consumer welfare by 2.2–2.6 percent of real income in the United States between 1970 and 2000 (Broda and Weinstein 2006).

### **Affordable variety and the Sustainable Development Goals**

*Affordable variety helps countries achieve SDG 9 (“Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”)*

Welfare is not limited to the mere expansion of consumption options. The virtuous circle is also a critical underpinning for attaining inclusive and sustainable industrial development, particularly SDG 9. The diversification of consumer preferences drives industrial development. When preferences steer away from the consumption of goods that are damaging to the environment or society, industrialization leads to greater inclusivity and sustainability. Acting directly on consumers, industrial development can contribute to achieving other SDGs.

*Affordability supports poverty alleviation*

Falling relative prices for consumer goods can contribute to poverty reduction. The channel towards poverty reduction is reinforced when product and process innovations are designed to address lower income segments of society. Innovations that redesign products and delivery systems to adapt them to the needs of low-income communities can increase the welfare of the poor. Examples range from the introduction of environmentally sound sanitation technology in traditionally neglected areas of India to the provision of affordable computers to rural residents in China.

*New and affordable food products contribute to food security*

The price channel is also one of the fundamental determinants of equitable access to safe and

## “ Global demand can be a powerful source of income generation

sustainable food for consumption. As long as competition exists in product markets, increased variety will bring down prices, increasing access. The reduction in prices for agricultural products may also occur as a result of the productivity increases in the rural sector that accompany technological changes in manufacturing. Agricultural machinery and fertilizers, for example, bring huge benefits to consumers, contributing to food security.

### *New and affordable medicines work towards ensuring healthy lives*

The production of affordable, quality-assured generic medicines in low- and middle-income countries can increase equitable access for all consumers. In such countries barriers to access to essential medicines that are safe to use can be onerous. Public health facilities sometimes provide generic medicines for free or at a very low cost, but availability is often low and quality difficult to assess. If pharmaceutical firms adhere to good manufacturing practices, local production can provide quality-assured medicines at affordable prices.

### *New and affordable household consumption durables support the achievement of gender equality*

Affordable variety can also help narrow gender disparities. The widespread diffusion of household appliances increases the opportunity cost associated with spending time on unpaid home-based activities, which women are generally expected to take on. The time released can be spent on market-oriented activities. Evidence that labour-saving technology may influence the distribution of unpaid housework within the household, however, remains ambiguous.

### *Income creation and access to affordable variety*

#### *At the country level, access to affordable variety requires a critical mass of income*

Access to affordable consumer products has major implications for consumer welfare but requires enough

incomes to be created. A key aspect of the virtuous circle is that demand diversification, as well as price, variety and volume effects, help generate this critical mass of incomes. At the global level, the incomes generated feed back into the circle as increased (global) demand. The world at large benefits—regardless of where production and consumption take place.

#### *In a globalized economy, demand and production are not necessarily in the same place*

For open economies in a globalized world, however, mechanisms can leak (or inject) new sources of income and demand outside (or within) the domestic economy. Growing domestic demand for a product can, for instance, be satisfied entirely by imports in countries with few industrial capabilities, hampering the workings of the virtuous circle. Figure 7 shows the possible mechanisms through which demand may leak or be injected in an individual economy.

#### *Income generation depends on who serves final demand and how*

In open economies, when new or existing varieties of goods are imported for domestic consumption, domestic demand leaks towards foreign production. A decline in the prices at which domestically produced goods are exported reduces nominal incomes in the domestic economy (see the red dashed lines in Figure 7). But global demand can also be a powerful source of income generation. It can take the form of injections of demand or increases in the purchasing power of domestic consumers thanks to imports of cheaper goods from abroad (see the green solid lines in Figure 7).

### **Capturing income from demand**

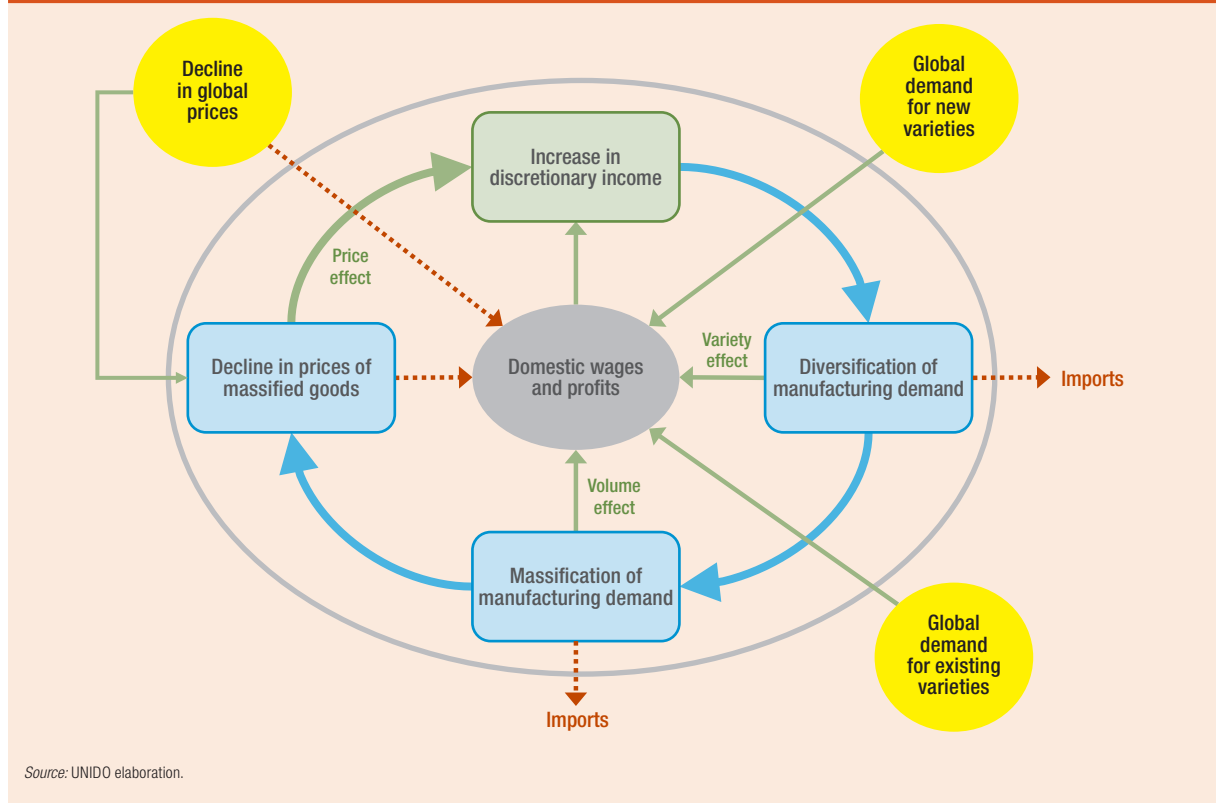
#### *Demand is split into two sources, domestic and foreign*

Initiating and sustaining the virtuous circle requires an increase in demand for locally produced manufactured goods. This demand can be either of domestic or foreign origin. To foster industrialization, policymakers need to consider the attributes of each.

**Industrialized economies generally rely the most on foreign demand, and least developed countries on domestic demand**

Figure 7

**The virtuous circle of manufacturing consumption: The domestic economy**



### Domestic demand

*Domestic demand is the most important component, especially in developing countries*

Domestic absorption (the sum of private household consumption, gross capital formation and final consumption by government and non-profit institutions) is the main driver of final demand for manufacturing—at the world level and across countries at different stages of industrial development (Figure 8).

Differences exist, however, across the world’s four country groups (industrialized economies, emerging industrial economies, other developing economies, and least developed countries). Industrialized economies generally rely the most on foreign demand, although even in these countries, domestic absorption remains by far the largest component (accounting for about two-thirds of the total). Least developed countries show the greatest reliance on domestic demand (about 90 percent).

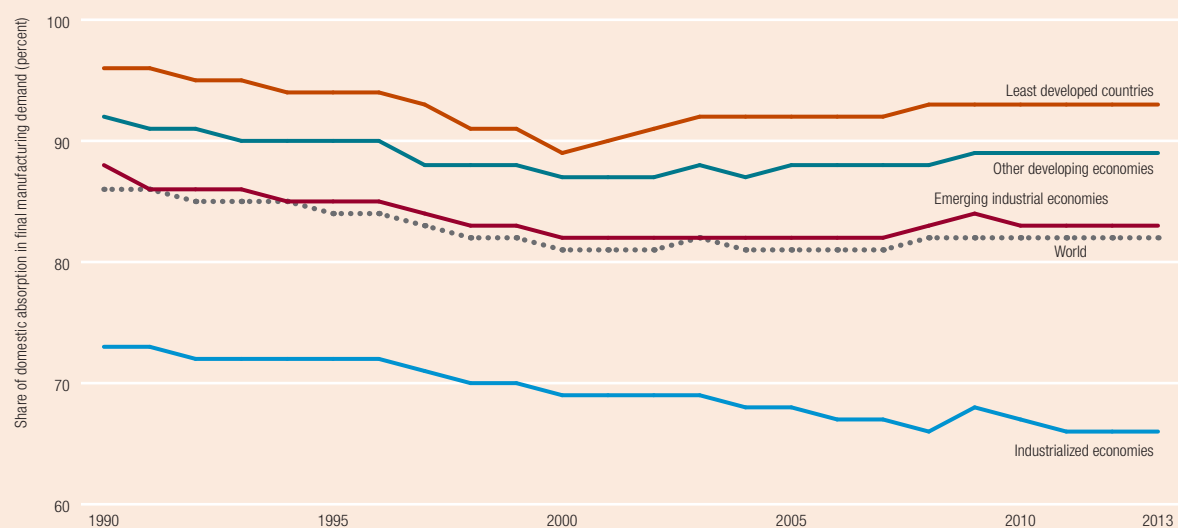
Globalization has made foreign demand increasingly important for all country groups. This trend was most evident in 1990–2000 (since 2000 the relative size of domestic absorption in developing and emerging industrial economies has been growing again, thanks largely to rebalancing, notably in China, partially reversing the trend of the previous decade).

*The importance of domestic demand as a source of income has increased across all country groups in recent years*

An analytical approach based on international input-output tables captures the mechanisms linking domestic and foreign demand to income creation. The approach shifts the focus from the value added generated in the manufacturing sector to the income (or value added) created by the consumption of final manufactured goods—regardless of the sector in which income is generated.

## Whether trade-driven industrialization has a beneficial effect depends crucially on how countries adjust their terms of trade

Figure 8  
Changing trends in the relative importance of domestic demand for final manufactures



Note: Domestic absorption comprises private household consumption, gross capital formation, and final consumption by governments and non-profit institutions. Each line shows the unweighted average of the indicator for the world and country groups. Industrialization level classification is based on Annex 1, Table A1.2.

Source: de Macedo and Lavopa (2017) based on the Eora Multi-Region Input-Output database (Lenzen et al. 2012; Lenzen et al. 2013).

The analysis shows that domestic demand is the main contributor to the creation of domestic value added in developing and emerging industrial economies. In contrast, foreign demand is more important in industrialized economies. The findings also reveal a generalized movement in recent years towards greater reliance on domestic demand, particularly in developing regions. Between 1990–2000 and 2000–2013, emerging industrial economies experienced a particularly rapid acceleration of income creation, as final demand for manufactures relied increasingly on domestic markets.

### Some country groups rely more on domestic demand than others

Overall trends mask variations across regions. In developing and emerging industrial economies in Africa and especially Asia and the Pacific, reliance on domestic demand grew between 1990–2000 and 2000–2013. Developing countries in Latin America experienced slightly declining growth rates, accompanied by a marked increase in the importance of domestic markets. Only in Europe did the importance of domestic demand decline between the two periods.

### Foreign demand

#### The income created from foreign demand depends on how countries adjust their terms of trade

The relationship between foreign demand for domestically produced goods and income creation is not unidirectional. Whether trade-driven industrialization has a beneficial effect depends crucially on how countries adjust their terms of trade. If countries consistently fail to upgrade their manufacturing export portfolios, for instance, they run the risk of seeing their terms of trade deteriorate, as commodification processes push industrial production in these countries towards inferior goods. Increasing the technological content of exports and upgrading quality can offset persistent declines in terms of trade. Innovation and technical change are therefore key for improving export prices and the terms of trade, which are crucial for long-run economic growth.

Whether and to what extent a country gains from its interactions with the global economy along the virtuous circle depends largely on the relationship between the value of its manufacturing exports and the price of its imports. A measure that captures

## “ The manufacturing income terms of trade reflects the ‘purchasing power’ of manufacturing exports

this relationship is the manufacturing income terms of trade (MITT). The MITT reflects the “purchasing power” of manufacturing exports—how much a country can import using the income generated by the exports of its manufacturing sector. As one would expect, there is a close positive correlation between income levels and MITT: Richer countries not only export more, they also export goods with higher technological content.

### *Greater purchasing power of manufacturing exports is associated with higher per capita income growth*

A strong positive correlation also exists between the changes in the purchasing power of manufacturing exports and growth of per capita income: Country groups that improved their MITT most rapidly between 2003 and 2015 also grew faster (Figure 9).

### *In some cases, a higher volume of exports at declining prices increases the purchasing power of manufacturing exports*

Price or volume effects can drive improvements in the MITT. The rapid increase in the purchasing power

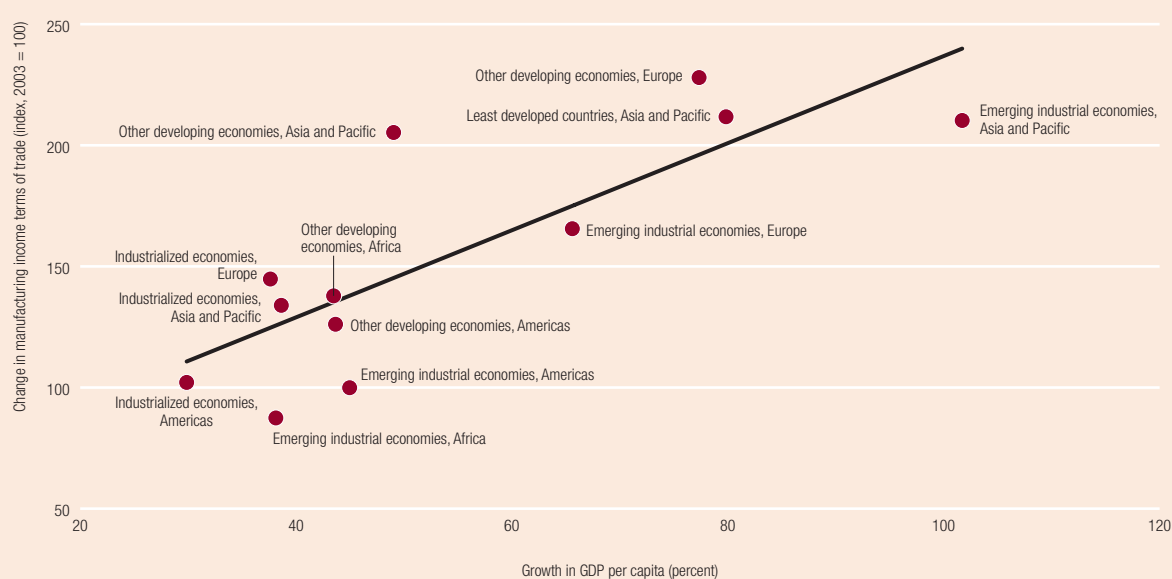
of manufacturing exports in the emerging industrial economies in the Asia-Pacific region in 2003–2014, for instance, reflects increases in export volumes, which outweighed the moderate decrease in the manufacturing barter terms of trade (the ratio between the price of a country’s manufactured exports and imports). Emerging industrial economies in the Asia and Pacific region seem to have increased their export volumes by lowering prices.

### *In other cases, diversification and quality upgrading increase the purchasing power of manufacturing exports*

Other country groups display different dynamics and the increase in the purchasing power of manufacturing exports is driven by improvements in export prices. This seems to be the case, for example, in the other developing economies in Africa, where the increase in the MITT is mostly explained by an increase in the manufacturing barter terms of trade. Countries can increase export prices by diversifying the composition of their export baskets and upgrading the technological content of their exports’ active product lines.

Figure 9

### **Increasing the purchasing power of exports is associated with higher growth rates in per capita GDP**



Note: All values for the period 2003–2014 are in constant 2003 PPP\$ (PPP is purchasing power parity). GDP is gross domestic product. Outliers with changes of over 500 percent relative to the base year have been omitted. Regional and industrialization level classifications are based on, respectively, Annex 1, Table A1.1 and A1.2.  
Source: UNIDO elaboration based on BACI International Trade Database (Gaulier and Zignago 2010).



## “ Wages are not just a production cost—they are also a fundamental driver of aggregate demand

Between 2003 and 2014 increases in the average product complexity of exports correlate positively with changes in the manufacturing barter terms of trade. The same observation applies to technological upgrading in active product lines. This evidence supports the view that technological upgrading is a crucial means of avoiding persistent declines in a country's terms of trade.

### *Rising unit values for manufactures are associated with long-run growth in per capita GDP*

The need for technological upgrading for domestic income generation becomes even more apparent when one looks directly at the relationship between manufacturing export prices and economic growth. The long-run impact of increases in a country's manufacturing export unit values, which are typically used as proxy for export prices, on domestic income generation appears to be broadly positive, across all country groups and regions. Given the strong association between technological content and unit values, there seems to be strong evidence in favour of upgrading the technological content of exports to capture incomes from the global demand of manufactures.

### **Keeping the virtuous circle turning**

#### ***A critical mass of income must be generated within the economy—and it should be well distributed***

#### *High inequality within countries can hamper the diffusion and massification of goods*

An income distribution that is highly skewed towards the rich is likely to dampen the consumption of domestically produced manufactures, because the wealthiest households have different consumption patterns from the rest and their preferences are more easily met by imports. Countries with household ownership rates of common consumer durables (such as washing machines and vacuum cleaners) that are lower than expected for their income level tend also to have below-average income equality. A

country with high income inequality may have too few consumers to sustain domestic manufacturing production.

#### *An expanding middle class increases opportunities to generate income from domestic demand*

Improvements in the distribution of income and, in particular, the size of the middle class are key factors fuelling domestic demand for manufactures and driving income creation along the circle. This report shows a clear positive correlation between the growth rate of value added induced by domestic manufacturing demand and the expansion in the share of people in the middle-income segment between 2001 and 2011.

#### *Increasing real wages foster domestic demand and drive income generation*

Wages are not just a production cost that needs to be reduced to achieve greater competitiveness. They are also a fundamental driver of aggregate demand—and are more likely than other sources of income to be spent on consumption items. The average annual growth rate of domestic value added generated by domestic absorption of final manufactured goods in 2001–2011 is positively correlated with the growth rate of real wages.

#### *Diversification of consumption baskets fuels income creation*

The creation of incomes from domestic demand is also positively correlated with the diversification of domestic private household consumption of manufactures.<sup>3</sup> Countries that diversified their consumption baskets the most between 2005 and 2011 tended to have the highest annual growth rates in income generated by domestic absorption of manufactures.

3. The diversification of domestic consumption was estimated using data from the World Bank's International Comparison Program database. These data were used to estimate proxies for the degree of diversity in manufacturing consumption baskets at the country level in 2005 and 2011. Diversification was defined as the change in this index between the two years.

## Industrial capabilities must be in place for domestic producers to serve growing demand

### Measuring the industrial capabilities needed

#### Benefiting from these factors requires industrial capabilities

These three factors—expansion of the middle class, real wage growth and diversification of domestic consumption—are critical to industrial development and the functioning of the virtuous circle. Not all countries may be able to exploit them to the same degree. Industrial capabilities must be in place for domestic producers to serve growing demand.

UNIDO's Competitive Industrial Performance (CIP) index provides a way to assess countries' industrial capabilities. It captures in a single measure the ability of countries to produce and export

manufactured goods competitively and achieve structural transformation. Countries that in the early 2000s ranked higher on the CIP index were more successful in capturing incomes from the three factors between 2001 and 2011. The positive relationships appear stronger for countries with higher CIP rankings, particularly for real wage growth and diversification of domestic demand (Figure 10).

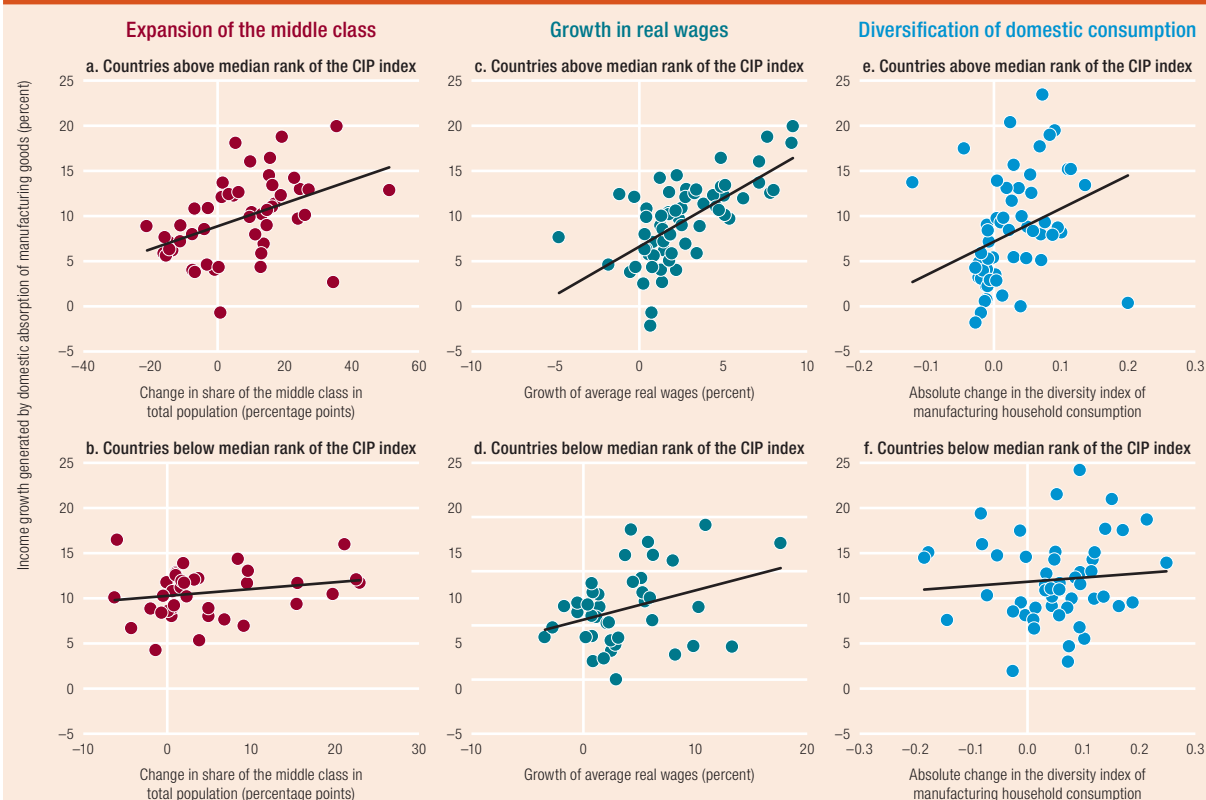
### Balance-of-payments tensions must be avoided

#### As income grows and demand diversifies, leakages to imported goods increase

Domestic constraints to market size can imperil the virtuous circle. International conditions can, too.

Figure 10

**Higher industrial capabilities are needed to benefit from middle class expansion, real wages gains and diversification of domestic consumption**



## “Countries must lift the purchasing power of their manufactured exports to avoid excessive pressures on their external accounts

In open economies where domestic demand leaks towards the consumption of imports, market-size gains from economies of scale and productivity often benefit foreign producers instead of domestic ones.<sup>4</sup> This appears particularly relevant against the current backdrop of increasing cross-border fragmentation of production, or “globalization,” which is reflected in growing import shares in final domestic absorption of manufactures and increasing foreign content in domestically produced goods.

### *Countries need to generate foreign exchange to fund increasing imports*

As countries get richer consumer preferences diversify from less sophisticated domestically sourced goods to imported ones, and goods produced domestically tend to draw increasingly on inputs and components sourced abroad. For this reason, foreign exchange requirements generally increase and countries must take steps to lift the purchasing power of their manufactured exports, in order to avoid excessive pressure on their external accounts.

If growing domestic consumption is satisfied through imports without an equivalent expansion in exports, economic growth is likely to hit balance-of-payments problems. The need to strengthen export capabilities, especially in emerging industrial economies rebalancing their economies, is critical.

### *Globally declining prices could lead some countries into commodity traps*

Not all export strategies are sustainable over time. Global declines in the prices of certain categories of goods can push countries into “commodity traps,” where their gains from exports will deteriorate over time. This, in turn, crimps their potential to raise

income and generate foreign exchange, particularly when they export labour-intensive manufactured goods that are easy to imitate. The resulting competition exerts downward pressure on prices. In these conditions an export-oriented strategy to diversify from primary into manufactured goods will struggle, unless policy-makers pursue export diversification and upgrading.

### *The price channel must be kept working, and consumers given information on goods*

#### *Productivity increases in manufacturing are passed on to consumers if relative prices decline*

As manufacturing productivity increases, output prices decline, because unit costs fall—a crucial underpinning of the virtuous circle. This price channel needs competition in product markets to ensure that productivity increases are passed on, in whole or in part, to consumers as lower prices.

Barriers to competition may arise within value chains. Consumer welfare is hurt when firms enjoy rents from their dominant position in a sector or chain. For the circle to be sustained, the relative prices of manufactured products should be allowed to decline to reflect productivity growth, and barriers to competition should be reduced.

#### *Lack of information on quality and safety of consumer goods can harm the circle's welfare gains*

The supply of environmentally unsustainable or sub-standard products (such as counterfeit drugs) diminishes consumer welfare. Lack of information on the quality and safety of consumer goods may greatly reduce the welfare gains from the virtuous circle. The introduction of stringent quality and safety standards is therefore important for the circle to stay virtuous.

#### *Quality and safety standards also lead to increased market access*

In a trade environment that is increasingly driven by technical regulations and quality standards, compliance with standards ensures that firms in developing

4. This negative effect can be counterbalanced by other benefits that imports bring to the domestic economy. Imports of capital and intermediate goods that are of higher quality than those available domestically can increase the productivity of importing firms. And if domestic firms are capable of absorbing the foreign technology embodied in imported goods, imports may result in knowledge spillovers and productivity gains.

## “ Access to good labour conditions is a key constituent of an industrialization agenda with social inclusiveness at its core

and emerging industrial economies continue to enjoy market access—and even increase their export shares in industrialized economies. Upgrading the quality of goods for export is therefore essential to remain competitive.

### Challenges to social inclusiveness and environmental sustainability

#### *Social inclusiveness and income inequality*

##### *Incomes created along the circle may not flow to the poorest people in society*

The virtuous circle does not itself guarantee socially inclusive or environmentally sustainable outcomes. Social inclusiveness requires that at least two conditions are in place. First, part of the income generated by the circle should flow to the poorest people in society, increasing welfare at the bottom of the pyramid. Second, traditionally marginalized groups should be able to participate fully in the market.

Several global trends hinder these aspirations. When the largest share of income goes to highly skilled workers, the inclusiveness of the circle is weakened. The trend towards greater automation of production skews the distribution of profits towards factory owners and managing directors, to the detriment of workers. Excessive concentration of income at the top of the distribution also has detrimental effects on the circle's functioning, as a critical mass of income is needed to launch the process.

##### *Price declines may be abetted by falling labour standards*

Without regulation, national or international, competitive pressures in global markets can undermine social inclusiveness. Many global value chains are highly cost-effective, but few provide much social protection, particularly for the low-skill and low-tech links (where competitive pressures are stronger). In these conditions the virtuous circle may not be so virtuous, instead benefiting groups of consumers in industrialized economies at the expense of workers.

##### *Other potentially negative societal impacts*

Industrial jobs can be hazardous, even deadly, particularly in lower income countries with labour-intensive plants and weak employment and environmental standards. The health and well-being of the wider community may also suffer from unchecked pollution. Access to good labour conditions and a healthy environment is a key constituent of an industrialization agenda with social inclusiveness at its core.

##### *Concentration of production in a few industrial hubs*

More broadly, how inclusive the circle is at the global level depends on the extent to which countries benefit from its income-generation mechanisms, as well as the modality in which they participate. When countries remain caught in the lower segments of global production—or are left out altogether—the circle cannot be regarded as globally inclusive.

##### *Gains from the circle are becoming geographically concentrated*

In 1990 about half of manufacturing production in developing and emerging industrial economies came from the five largest economies in the group (Brazil, China, India, Indonesia and Mexico). In 2016 these five countries accounted for roughly three-quarters of the group's total, with China alone shooting up to 55 percent of that total, from 15 percent. This trend raises concern about the circle's potential to drive social inclusiveness worldwide.

##### *Technology has the potential to change the geography of production*

ICT can help producers—including producers in countries that are currently marginalized in international production networks—tap hitherto inaccessible markets. When combined with emerging technologies that enable new forms of manufacturing—such as additive manufacturing or 3D printing—it can help entrepreneurs access world markets for mass customized articles. Innovations in manufacturing can lead towards a more even distribution of production activities across borders.

“Since the early 1970s, the world has been consuming natural resources faster than the earth has been producing them

## Environmental sustainability—or lack of it

### Mass consumption puts pressures on the environment

The growing mass consumption of manufactured products is likely to increase demand for non-renewable natural resources, such as fossil fuel energy and materials, putting severe pressure on the environment. Manufacturing also generates huge amounts of waste, putting current disposal systems under mounting pressure. The virtuous circle is thus characterized by binding environmental constraints.

### Current consumption patterns may be unsustainable

Since the early 1970s, the world has been consuming natural resources faster than the earth has been producing them (Figure 11). There is no guarantee that natural resource-based economic activities will continue once the stock is depleted. The current path of production and consumption may be unsustainable.

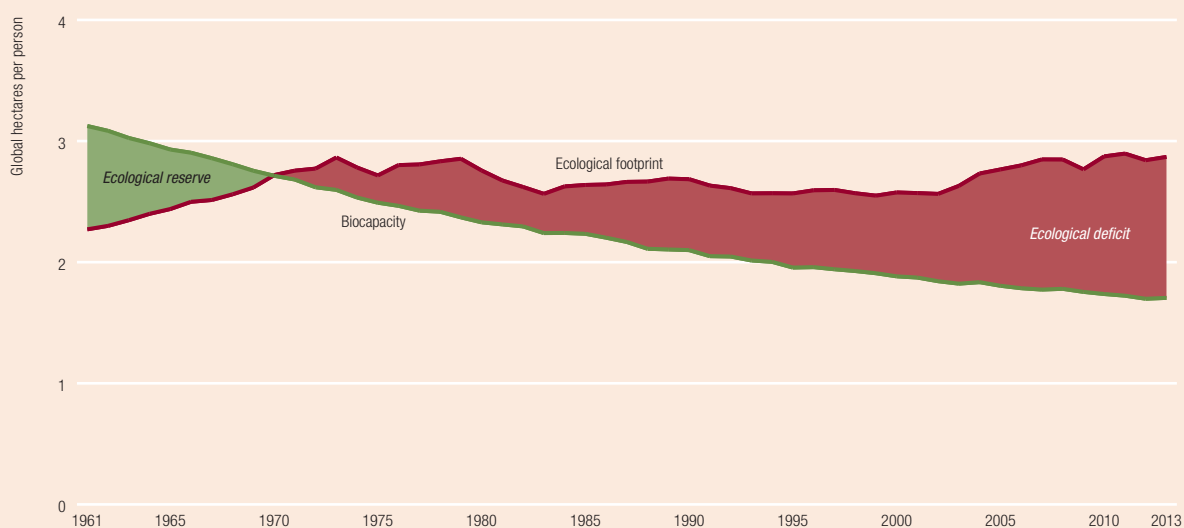
Climate change is a heavy source of long-term pressure on the environment, especially in poorer countries. Between 2020 and 2100, annual growth of GDP per capita could fall from 3.2 percent to 2.6 percent as a result of climate change-related impacts on capital accumulation and total factor productivity (Moore and Diaz 2015).

Waste is also a growing problem. Increased income generates more packaging, imports, electronic waste and appliances. Although waste is projected to peak by 2050 in the countries comprising the Organisation for Economic Co-operation and Development (OECD) and by 2075 in Asia and Pacific, it will continue to rise in the fast-growing cities of Sub-Saharan Africa (Hoornweg et al. 2013).

### Environmental pressures from increasing living standards are still too strong...

Carbon dioxide emissions and the use of materials increased in manufacturing between 1995 and 2014. The trend of emissions and materials consumption in manufacturing can be understood by using a

Figure 11  
Global biocapacity went into the red nearly half a century ago



Note: Global Footprint Network refers to global biocapacity as "the ecosystems' capacity to produce biological materials used by people and to absorb waste material generated by humans, under current management schemes and extraction technologies." The ecological footprint is defined as the amount of biologically productive land and water needed by an entity—individual, population or activity—to facilitate the production of all consumed resources and to absorb the waste generated in this process. An entity's footprint is measured in global hectares and given the global nature of trade, the footprint takes into account land and sea from all over the world. Read more definitions related to the National Footprint Accounts at: <http://data.footprintnetwork.org>.  
Source: Global Footprint Network National Footprint Accounts, 2017 Edition (Global Footprint Network 2017).

## “ Expanding markets for ‘environmental goods’ would contribute to a sustainable virtuous circle of manufacturing consumption

decomposition approach that investigates the impact of three main components: the scale effect (the increase in environmental pressure from higher living standards and consumption), the intensity effect (the decrease in environmental pressure per unit of value added or consumption as a result of technological change) and the composition effect (changes in environmental pressure from variations in the sectoral composition of consumption and production patterns). The scale effect is preponderant in explaining the increase of emissions and use of materials, especially in emerging economies.

### *Reconciling industrialization with environmental protection*

Expanding markets for “environmental goods” would contribute to a *sustainable* virtuous circle of manufacturing consumption (Figure 12).<sup>5</sup> With such markets, industrial firms would be able to replace fossil fuel inputs with renewable energy sources. Business models that help firms increase their resource efficiency would also promote sustainability. By adopting circular economy models, for instance, countries could radically transform the management of waste by enabling a “closed loop” of material use between production and consumption. All these developments would help mitigate environmental impacts, allowing the production of larger volumes of output with fewer inputs (Bourguignon 2016).

### *Fostering the circular economy*

The full operationalization of the sustainable virtuous circle of consumption is consistent with the realization of a circular economy. According to UNIDO (2017a), in a circular economy “products are designed for durability, reuse and recyclability, and materials for new products come from old products. As much

5. *Industrial Development Report 2018* defines environmental goods as those that respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emission of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of further generations. This definition is inspired by the Oslo Symposium of 1994 (Norwegian Ministry of Environment 1994).

as possible, everything is reused, remanufactured, recycled back into a raw material, used as a source of energy, or as a last resort, disposed of.”

### *What prevents a rapid transition towards the full massification of environmental goods?*

Environmental goods have not completed their transition towards massification: Over the period 1988–2014 environmental goods, as classified by the OECD list,<sup>6</sup> despite a growing trend accounted for less than 8 percent of world exports (Cantore and Cheng 2017). A variety of obstacles impedes consumers from moving towards goods characterized by a lower environmental impact.

### *High production costs and consumer prices*

The production of environmental goods requires higher-cost materials and production techniques. When the consumption of a good is price elastic, consumers tend to prefer more affordable goods and are generally unwilling to pay a premium for environmental goods.

Fortunately, the prices of many environmental goods are dropping radically, because of learning effects and technological change. Light-emitting diode (LED) lamps, for instance, could soon complete their massification process and fully replace less energy-efficient lamps.

### *Other factors affecting the consumption of environmental goods*

The medium- and long-term savings associated with the consumption of more energy-efficient products influence consumers. But consumers do not always shift their preferences to goods with a lower environmental footprint rapidly enough to decouple economic growth and environmental degradation.

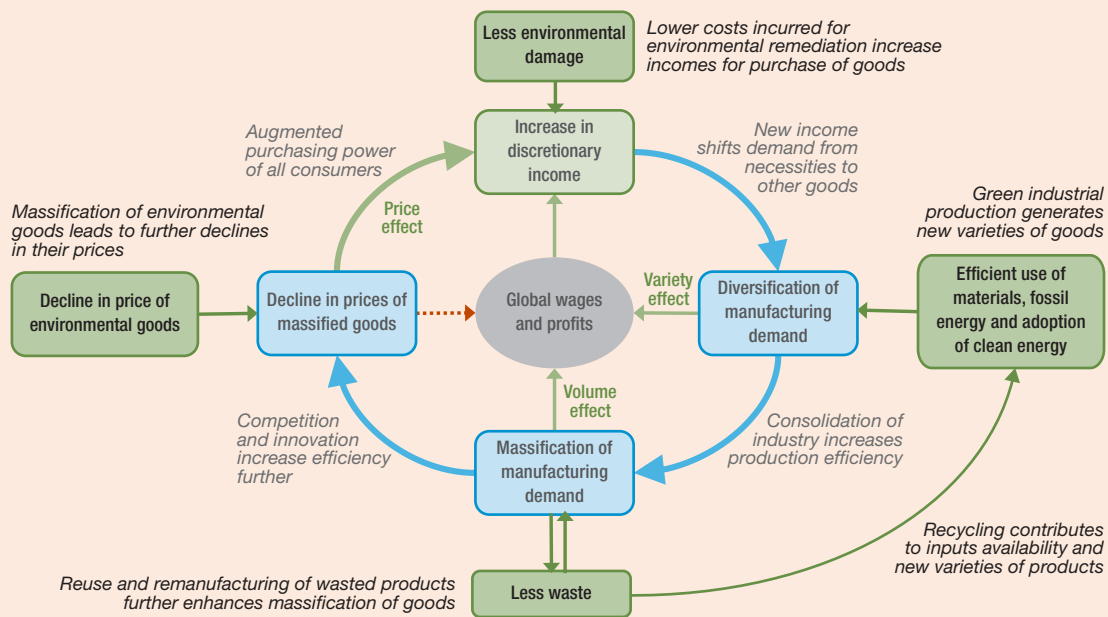
The purchase of an environmental good is based on three crucial stages. First, consumers become

6. This list is presented and discussed in Steenblick (2005). As the author emphasizes, however, the OECD list of environmental goods is far from exhaustive and does not cover all environmental goods.

## “ Policy-makers should strike a balance between policies that target supply and demand

Figure 12

### A sustainable virtuous circle of manufacturing goods



Source: UNIDO elaboration.

aware of the environmental threat and keen to help mitigate it through consumption. Second, they acquire the necessary information about the impact of environmental goods on the environment. Third, they buy the environmental good, on the basis of their pro-environment attitude and their trust that the good delivers the expected environmental impact. At all three stages, biases may affect consumer behaviour:

- Too little public awareness about the seriousness of the impending environmental threat is a barrier. In one survey almost half the respondents in some industrialized economies believed the environmental impacts to be overstated (OECD 2014).
- Lack of information on products, costs and, in some instances, potential savings also hinders consumption of environmental goods. Labelling and certification can help highlight the environment-friendly attributes of products, as well as the monetary benefits, steering consumers towards buying

them. Labelling and marketing campaigns for environmental goods can also generate profits for firms.

- Perceptions that companies may make exaggerated claims or even lie about their products' environmental attributes prevent wider diffusion of sustainable and energy-efficient products.

### Managing demand for manufactured goods

#### Moving from findings to action

The virtuous circle involves a recursive process of income generation, product diversification, quality upgrading, mass consumption and changes in volumes and relative prices of manufactured products. It draws links to innovation, production efficiency and productivity gains. Various conditions set the circle in motion. How can policy-makers in developing countries turn these findings into areas for intervention?

## “ Governments may directly intervene in the economic system, foster partnerships or underpin the private sector’s role as the driver of industrialization

### *Economic goals remain top priorities in industrial policy debates*

Because countries differ significantly in their productive and technological capabilities, as well as policy-making abilities, industrial policy remains open to learning and experimentation in search of practical ways to reconcile distinct, and often conflicting, approaches to industrialization. Policy-makers should strike a balance between policies that target supply, demand, or both, considering the risks of government intervention and the changing environment for industrial policy.

### *A demand perspective to industrial policy*

The contribution of demand for manufactured goods and related services to structural change should not be underestimated. Changes in demand can either constrain or enhance opportunities for industrialization. The extent to which demand drives industrialization depends on factors such as the size of the economy and the domestic market, the strength of domestic technological and manufacturing capabilities, the natural resources endowment, the extent of international collaboration and insertion into global value chains and the relative weight granted to domestic or external markets for domestic manufactured products.

### *A continuum: From framework conditions to actionable variables*

Demand for manufactured goods can be interpreted as a variable along a continuum. At one end, demand can be a framework condition, partially or completely outside the control of policy-makers. In this case, government can work as (a mix of) facilitator, technological capability-building partner or market antenna. At the other end, demand can be an actionable variable in industrial policy intervention. In this case, government can work as (a combination of) information provider/awareness raiser, regulator, enabler/co-generator of innovation or consumer (through public procurement). The two cases lead governments to assume distinct roles and implement different combinations of supply- and demand-oriented interventions.

Governments may directly intervene in the economic system, foster partnerships or underpin the private sector’s role as the driver of industrialization.

### *Framework conditions*

Framework conditions can either constrain or open windows of opportunity for industrialization. When demand is perceived as a framework condition, responses are generally supply driven (including trade- or exchange rate-related regimes, fiscal incentives, competition and labour policy reforms, incentives for diversification and technological upgrading), connected to at least one of three possible government roles:

- Facilitating the removal of market failures, so that domestic firms can build on current comparative advantages.
- Promoting domestic technological and productive capabilities, to favour entry into sectors otherwise impossible to develop given the country’s traditional comparative advantages.
- Supporting development of capacities to help domestic firms identify or anticipate demand changes (such as through technological foresight or related practices).

### *Actionable variables: Four government roles*

With actionable variables, government can play four major roles to steer demand towards inclusive and sustainable industrialization goals, alone or in combination: regulation (their traditional role), knowledge brokerage (to signal market opportunities or desired directions for industrialization and related consumer behaviour), active promotion of industrial innovation and public procurement of manufactured goods. Table 1 presents a schematic of various government roles in relation to demand.

### **Examples of demand-driven industrial policies**

Developing and emerging industrial economies in Africa, Asia and Latin America exemplify how demand-driven policies have been deployed in pursuit of economic, social inclusiveness and environmental



## “Government can steer demand towards inclusive and sustainable industrialization through regulation, knowledge brokerage, innovation promotion and public procurement

Table 1

**Government roles and industrial policy interventions for demand as a framework condition or an actionable variable**

Nature of demand/ role of government	Description of intervention	Examples of interventions
<i>Framework condition</i>		
Facilitator of industrialization and upgrading	Remove market failures so that firms can build on comparative advantages to take advantage of external demand conditions or opportunities for industrialization.	<ul style="list-style-type: none"> <li>• Fiscal, monetary, exchange rate and employment policies</li> <li>• Provision of credits or loan guarantees</li> <li>• Incentives for foreign direct investment (FDI)</li> <li>• Export promotion and competition policies</li> </ul>
Technological capability-building partner	Promote adoption, use and (eventually) development of technologies that enhance knowledge bases and presence in domestic and international markets.	<ul style="list-style-type: none"> <li>• Selective industry protection</li> <li>• Creation of public research centres</li> <li>• Promotion of corporate research and development (R&amp;D)</li> <li>• Technology transfer mechanisms and joint venture agreements</li> <li>• Export promotion</li> <li>• Import substitution</li> <li>• Selective FDI</li> <li>• Skills training</li> </ul>
Market antenna	Help domestic agents identify or anticipate changes in technologies with implications for the dynamics of manufacturing.	<ul style="list-style-type: none"> <li>• Foresight services and market intelligence</li> </ul>
<i>Actionable variable</i>		
Information provider and/or awareness raiser	Influence consumer knowledge, awareness, readiness and capabilities to consume certain manufacturing products.	<ul style="list-style-type: none"> <li>• Communication, education and awareness-raising campaigns</li> <li>• National brands</li> <li>• Voluntary labelling</li> </ul>
Regulator	Stimulate and regulate consumption of manufacturing products or influence consumer behaviour through changes in relative prices.	<ul style="list-style-type: none"> <li>• Fiscal (taxes, tariffs, quotas, subsidies, tax credits or exemptions); monetary; and exchange rate policies</li> </ul>
	Influence consumption of manufacturing products or guide consumer behaviour through laws, directives and regulations.	<ul style="list-style-type: none"> <li>• Mandatory standards and labels</li> </ul>
Enabler/co-generator of innovation	Promote, enhance or create demand for innovative products by targeting final users.	<ul style="list-style-type: none"> <li>• Grants and subsidies for consumption of innovation</li> </ul>
Consumer	Promote consumption of manufacturing products, guide strategic investments in innovation, address societal needs through provision of manufactured goods and ensure a market for strategic industries or economic activities.	<ul style="list-style-type: none"> <li>• Public procurement</li> </ul>

Source: UNIDO elaboration based on Santiago Rodríguez and Weiss (2017), Santiago Rodríguez et al. (2017) and Lin and Chang (2009).

sustainability goals, often simultaneously. Time is frequently of the essence, despite the policies' heterogeneity.

### *Economic goals*

Policy-makers have adopted instruments to create demand for strategic sectors or firms, dismantling barriers to participating in international trade, informing consumers about the quality and safety of consumer goods and so on. Examples include strategic public

procurement (such as local content requirements in South Africa's railway or Sri Lanka's ICT sector); adoption of standards and certification (quality upgrading and export promotion in Rwanda's coffee sector); and knowledge and information to influence consumer awareness and choices to foster demand for domestic producers (national branding campaigns in Ecuador and Uganda). Public demand, in combination with regulation and fostering aggressive market orientations, can enable domestic firms to respond to

## “ Demand-driven policies can be tailored to suit different government roles and intended development outcomes

emerging demands in certain market segments with potential to sustain growth over the medium-to long term (aircraft manufacturing in Brazil).

### *Social inclusiveness goals*

Policy-makers can facilitate access to goods, reduce their price and enhance their quality. Examples include health reform in Mexico and regional efforts to reduce the cost of essential medicines in Latin America through pooled procurement.

Countries can also seek to ensure equal access by manufacturers from societal sectors that were deprived of or face unfavourable access to markets. Examples include quotas in strategic public procurement for women-led enterprises in the Dominican Republic and preferential access and capacity building for small and medium-size enterprises in Sri Lanka's ICT sector.

### *Environmental sustainability goals*

To render the virtuous circle environmentally sustainable, countries must remove barriers and stimulate drivers for massifying environmental goods. They can do so through market- or regulatory-based policies.

Direct incentives to consumers seek to reorient industrial activity towards cleaner processes or the adoption of more environmental-friendly products and services. Examples include subsidies for buying “new-energy vehicles” in China and the Republic of Korea. Governments can also enhance perceived benefits through consumer education and awareness raising or affect demand for environmental goods directly through public procurement.

International policy coordination can be invaluable, as domestic efforts seem insufficient to address global environmental challenges. One example of successful coordination is the Ecolabel, introduced in 1992 as a third-party certified standard to promote products and services with reduced environmental impacts in the European market. Another is the Montreal Protocol of 1987. Changes in the international regulation of production were key drivers to

stimulate different, more sustainable consumption patterns. In its first 30 years the Montreal Protocol achieved the almost total phase-out of five groups of ozone-depleting substances and an almost 40 percent reduction in the consumption and production of hydrochlorofluorocarbons, with a view to phasing them out entirely by 2030.

### *International partnerships contribute to inclusive and sustainable industrialization*

Governments can partner with international organizations to accelerate progress towards inclusive and sustainable industrialization. Leveraging complementary assets and international expertise within the framework of national industrial strategies has multiple benefits. International bodies help countries meet consumer demand in advanced economies by strengthening compliance with quality and safety standards.

### *Policies are heterogeneous*

Demand-driven policies can be tailored to suit different government roles and intended development outcomes. Those policies are better understood within complex policy mixes, in interaction with supply-driven interventions. There is scope for synergies: Decisions made by a ministry of industry can affect areas such as health, and decisions made by ministries of health (or other social sectors) can signal gaps in the development of domestic manufacturing activities. Governments need to set clear priorities and goals and be aware of possible trade-offs between policy tools and intended targets. Enhanced monitoring and evaluation is needed to better codify experiences in the use of demand-driven policy instruments.

### *Finally*

Governments should carefully consider the scope of demand-driven interventions to address social- and environment-related outcomes, helping better align the virtuous circle with the objectives of inclusive and sustainable industrial development.

# Annexes

## Annex 1 Country and economy groups

Table A1.1

**Countries and economies by region**

<b>AFRICA</b>				
<i>Central Africa</i>				
Cameroon	Chad	Equatorial Guinea	São Tomé and Príncipe	
Central African Republic	Congo, Republic of the		Gabon	
<i>Eastern Africa</i>				
Burundi	Djibouti	Ethiopia	Réunion	Somalia
Comoros	Eritrea	Kenya	Rwanda	Uganda
<i>North Africa</i>				
Algeria	Libya	South Sudan	Tunisia	
Egypt	Morocco	Sudan		
<i>Southern Africa</i>				
Angola	Lesotho	Mauritius	Seychelles	Tanzania, United Republic of
Botswana	Madagascar	Mozambique	South Africa	Zambia
Congo, Dem. Republic of the	Malawi	Namibia	Swaziland	Zimbabwe
<i>Western Africa</i>				
Benin	Gambia	Liberia	Nigeria	
Burkina Faso	Ghana	Mali	Senegal	
Cabo Verde	Guinea	Mauritania	Sierra Leone	
Côte d'Ivoire	Guinea-Bissau	Niger	Togo	
<b>AMERICAS</b>				
<i>Latin America</i>				
<i>Caribbean</i>				
Anguilla	British Virgin Islands	Dominican Republic	Martinique	Saint Vincent and the Grenadines
Antigua and Barbuda	Cayman Islands	Grenada	Montserrat	Trinidad and Tobago
Aruba	Cuba	Guadeloupe	Puerto Rico	United States Virgin Islands
Bahamas	Curaçao	Haiti	Saint Kitts and Nevis	
Barbados	Dominica	Jamaica	Saint Lucia	
<i>Central America</i>				
Belize	El Salvador	Honduras	Nicaragua	
Costa Rica	Guatemala	Mexico	Panama	
<i>South America</i>				
Argentina	Chile	French Guiana	Peru	Venezuela, Bolivarian Republic of
Bolivia, Plurinational State of	Colombia	Guyana	Suriname	
Brazil	Ecuador	Paraguay	Uruguay	
<i>North America</i>				
Bermuda	Canada	Greenland	United States	

<b>ASIA AND PACIFIC</b>				
<i>Central Asia</i>				
Kazakhstan	Mongolia	Turkmenistan		
Kyrgyzstan	Tajikistan	Uzbekistan		
<i>East Asia</i>				
China	Japan	Macao SAR, China	Singapore	
Hong Kong SAR, China	Korea, Republic of	Malaysia	Taiwan Province of China	
<i>South Asia</i>				
Afghanistan	Bhutan	Maldives	Pakistan	
Bangladesh	India	Nepal	Sri Lanka	
<i>South East Asia</i>				
Brunei Darussalam	Indonesia	Myanmar	Thailand	
Cambodia	Lao People's Dem. Republic	Philippines	Viet Nam	
<i>West Asia</i>				
Armenia	Iraq	Lebanon	State of Palestine	
Azerbaijan	Israel	Oman	Syrian Arab Republic	
Bahrain	Jordan	Qatar	United Arab Emirates	
Iran, Islamic Republic of	Kuwait	Saudi Arabia	Yemen	
<i>Other Asia and Pacific</i>				
American Samoa	French Polynesia	Marshall Islands	Palau	Tonga
Australia	Guam	Micronesia, Federated States of	Papua New Guinea	Tuvalu
Cook Islands	Kiribati	New Caledonia	Solomon Islands	Vanuatu
Fiji	Korea, Dem. People's Republic of	New Zealand	Timor-Leste	
<b>EUROPE</b>				
<i>European Union<sup>a</sup></i>				
Austria	Finland	Italy	Portugal	United Kingdom
Belgium	France	Lithuania	Slovakia	
Czechia	Germany	Luxembourg	Slovenia	
Denmark	Hungary	Malta	Spain	
Estonia	Ireland	Netherlands	Sweden	
<i>Other European</i>				
Albania	Croatia	Latvia	Montenegro	Serbia
Andorra	Cyprus	Liechtenstein	Norway	San Marino
Belarus	Georgia	Macedonia, Former Yugoslav Republic of	Poland	Switzerland
Bosnia and Herzegovina	Greece	Moldova, Republic of	Romania	Turkey
Bulgaria	Iceland	Monaco	Russian Federation	Ukraine

a. Excluding non-industrialized EU economies.  
Source: UNIDO elaboration based on UNIDO (2017c).

Table A1.2

**Countries and economies by industrialization level**

<b>Industrialized economies</b>				
Aruba	Denmark	Ireland	Monaco	Slovenia
Andorra	Estonia	Israel	Netherlands	Spain
Australia	Finland	Italy	New Caledonia	Sweden
Austria	France	Japan	New Zealand	Switzerland
Bahrain	French Guiana	Korea, Republic of	Norway	Taiwan Province of China
Belgium	French Polynesia	Kuwait	Portugal	United Arab Emirates
Bermuda	Germany	Liechtenstein	Puerto Rico	United Kingdom
British Virgin Islands	Greenland	Lithuania	Qatar	United States
Canada	Guam	Luxembourg	Russian Federation	United States Virgin Islands
Cayman Islands	Hong Kong SAR, China	Macao SAR, China	San Marino	
Curaçao	Hungary	Malaysia	Singapore	
Czechia	Iceland	Malta	Slovakia	
<b>Developing and emerging industrial economies</b>				
<i>Emerging industrial economies</i>				
Argentina	Colombia	Kazakhstan	Romania	Turkey
Belarus	Costa Rica	Latvia	Saudi Arabia	Ukraine
Brazil	Croatia	Macedonia, Former Yugoslav Republic of	Serbia	Uruguay
Brunei Darussalam	Cyprus	Mauritius	South Africa	Venezuela, Bolivarian Republic of
Bulgaria	Greece	Mexico	Suriname	
Chile	India	Oman	Thailand	
China	Indonesia	Poland	Tunisia	
<i>Other developing economies</i>				
Albania	Cook Islands	Guyana	Mongolia	Saint Lucia
Algeria	Côte d'Ivoire	Honduras	Montenegro	Saint Vincent and the Grenadines
Angola	Cuba	Iran, Islamic Republic of	Montserrat	Seychelles
Anguilla	Dominica	Iraq	Morocco	Sri Lanka
Antigua and Barbuda	Dominican Republic	Jamaica	Namibia	State of Palestine
Armenia	Ecuador	Jordan	Nicaragua	Swaziland
Azerbaijan	Egypt	Kenya	Nigeria	Syrian Arab Republic
Bahamas	El Salvador	Korea, Dem. People's Republic of	Pakistan	Tajikistan
Barbados	Equatorial Guinea	Kyrgyzstan	Palau	Tonga
Belize	Fiji	Lebanon	Panama	Trinidad and Tobago
Bolivia, Plurinational State of	Gabon	Libya	Papua New Guinea	Turkmenistan
Bosnia and Herzegovina	Georgia	Maldives	Paraguay	Uzbekistan
Botswana	Ghana	Marshall Islands	Peru	Viet Nam
Cabo Verde	Grenada	Martinique	Philippines	Zimbabwe
Cameroon	Guadeloupe	Micronesia, Federated States of	Réunion	
Congo, Republic of the	Guatemala	Moldova, Republic of	Saint Kitts and Nevis	

<i>Least developed countries</i>				
Afghanistan	Comoros	Lao People's Dem. Republic	Niger	Tanzania, United Republic of
American Samoa	Congo, Dem. Republic of the	Lesotho	Rwanda	Togo
Bangladesh	Djibouti	Liberia	São Tomé and Príncipe	Tuvalu
Benin	Eritrea	Madagascar	Senegal	Uganda
Bhutan	Ethiopia	Malawi	Sierra Leone	Vanuatu
Burkina Faso	Gambia	Mali	Solomon Islands	Yemen
Burundi	Guinea	Mauritania	Somalia	Zambia
Cambodia	Guinea-Bissau	Mozambique	South Sudan	
Central African Republic	Haiti	Myanmar	Sudan	
Chad	Kiribati	Nepal	Timor-Leste	

Source: UNIDO elaboration based on UNIDO (2017c).

## Annex 2 Classification of manufacturing consumption goods

Table A2.1

### Classification of individual consumption of manufacturing goods

Description	Consumption goods
Food and non-alcoholic beverages	1.1 Food; 1.2 Non-alcoholic beverages.
Alcoholic beverages, tobacco and narcotics	2.1 Alcoholic beverages; 2.2 Tobacco; 2.3 Narcotics.
Clothing and footwear	3.1.1 Clothing materials; 3.1.2 Garments; 3.1.3 Other articles of clothing and clothing accessories; 3.2.1 Shoes and other footwear.
Furnishings, household equipment and routine household maintenance	5.1.1 Furniture and furnishings; 5.1.2 Carpets and other floor coverings; 5.2 Household textiles; 5.3.1 Major household appliances whether electric or not; 5.3.2 Small electric household appliances; 5.4 Glassware, tableware and household utensils; 5.5 Tools and equipment for house and garden; 5.6.1 Non-durable household goods.
Health	6.1 Medical products, appliances and equipment (6.1.1 Pharmaceutical products; 6.1.2 Other medical products; 6.1.2 Therapeutic appliances and equipment (includes the repair of such articles (S))).
Transport	7.1 Purchase of vehicles (7.1.1 Motor cars; 7.1.2 Motorcycles; 7.1.3 Bicycles; 7.1.4 Animal drawn vehicles); 7.2.2 Fuels and lubricants for personal transport equipment.
Communication	8.2 Telephone and telefax equipment (includes repair of such equipment (S)).
Recreation and culture	9.1 Audio-visual, photographic and information processing equipment (excludes repair of such equipment (S)); 9.2.1 Major durables for outdoor recreation; 9.2.2 Musical instruments and major durables for indoor recreation; 9.3 Other recreational items and equipment, gardens and pets (excludes veterinary and other services for pets (S)); 9.5 Newspapers, books and stationery.
Miscellaneous goods and services	12.1.3 Other appliances, articles and products for personal care; 12.3.1 Jewellery, clocks and watches (includes repair of such articles (S)); 12.3.2 Other personal effects (includes repair of such articles (S)).

Note: Items denoted by the letter (S) are services. Codes in the column "Consumption goods" correspond to the Classification of Individual Consumption According to Purpose (COICOP).

Source: UNIDO elaboration based on UNSD (n.d.) and Duarte (2017).

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# Contents of *Industrial Development Report 2018*

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“The UNIDO Industrial Development Report series is an excellent source of information on policies and data relating to contemporary industrialisation. The 2018 Report focuses on demand – both internal and external – and shows the role of manufacturing in providing consumer goods, foreign exchange and employment. The report shows clearly how manufacturing continues to be important as countries seek to reorient their economies on more inclusive and sustainable growth paths. It will interest a wide audience, including policymakers and academic researchers.”

John Weiss, Emeritus Professor of Development Economics, University of Bradford, UK

“Industrial policy has always been seen as the ultimate supply-side policy. However, using a sophisticated and multifaceted approach, this report shows how demand-side issues are crucial in understanding and designing industrial policy. It is a path-breaking contribution to the debate on industrial policy that should enlighten both policymakers and academics working on the issue.”

Ha-Joon Chang, University of Cambridge, UK

