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The Importance of Trade For MSEs in The Indonesian F&B Sector

by Hasran & Krisna Gupta

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in The Indonesian F&B Sector**

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GLOSSARY

ADB:

Asian Development Bank

ARDL:

Autoregressive Distributed Lag

BPS:

Badan Pusat Statistik/Statistic Indonesia

CMEA:

Kementerian Koordinator Bidang Perekonomian/Coordinating Ministry for Economic Affairs

F&B:

Food and Beverages

FLFP:

Female Labor Force Participation

GDP:

Gross Domestic Product

IBS:

Industri Besar dan Sedang/Medium and Large Industry

MoA:

Kementrian Pertanian (Kementan)/ The Ministry of Agriculture

MoI:

Kementrian Perindustrian/ The Ministry of Industry

MoMAF:

Kementrian Kelautan dan Perikanan/ The Ministry of Marine Affairs and Fisheries

MoT:

Kementrian Perdagangan (Kemendag)/The Ministry of Trade

MSEs:

Micro and Small Enterprises

NTM:

Non-Tariff Measures

Renstra:

Rencana Strategis/ The strategic plan

RIPIN:

Rencana Induk pembangunan Industri Nasional/ National Industry Development Master Plan

SI:

Survei Industri/ Industrial Survey

Susenas:

Survey sosial dan ekonomi nasional/ The National Socio-Economic Survey

WBES:

World Bank Enterprise Survey

WTO:

World Trade Organization

EXECUTIVE SUMMARY

In 2019, the food & beverage (F&B) industry made the largest contribution to the nation's gross domestic product (GDP) and grew by an average of 7.78%, the highest growth among non-oil and gas industries. It is also the only non-oil and gas industry experiencing a trade surplus. In 2019, imports by this industry decreased by an average of 0.1%, while annual export growth averaged 0.7%.

The F&B sector was the largest employer of Indonesian workers outside the oil and gas sector in 2019. While around a third (36%) of workers in large and medium-sized F&B companies are female, they account for more than half of workers (56% in the food industry and 58% in the beverage industry) in micro and small enterprises (MSEs).

Intermediate goods are important for the F&B industry, and importing them increases both productivity and exports, but imports are politically unpopular among ministries governing the F&B sector. The Ministry of Agriculture seeks to reduce imports with the goal of supporting farmers and their welfare. The Ministry of Industry (Mol) aims to reduce reliance on imported intermediate goods for the F&B sector by strengthening upstream industries.

This paper shows how imports of intermediate goods benefit F&B industries in terms of output and employment. We estimate that among small and micro-sized F&B firms, increased imported intermediate inputs will lead to increases in output, value added, and wages, as well as improvement on intensive margins. These findings show why the government's policy of discouraging imports to support Indonesian firms is misguided, potentially harming the industry it's meant to help.

This paper offers six policy recommendations: First, Mol should review its import substitution policy in food production and provide a rationale for pairing import reduction targets with F&B industry growth. Second, the government should study the impact of trade on the F&B manufacturing. Third, the government should separate data on the palm oil industries from the F&B industries generally. Fourth, the government should improve data quality and ensure these data are available to the public. Fifth, the government should conduct a real-time evaluation of its Commodity Balance (Neraca Komoditas) policy and domestic downstream policies. Finally, Mol should consider evaluating its domestic downstream policies to pursue its goals with tools other than trade policy.

STATE OF THE F&B SECTOR IN INDONESIA

The food and beverages (F&B) sector includes agricultural production, F&B manufacturing, and F&B services, and covers all processing activities in a food value chain linking agricultural products with consumers. The F&B industry includes milling industries, production of intermediary goods such as salt and sugar, and food processing for packaged foods, all crucial parts of the complex food system. F&B services cover food distribution through wholesale and retail channels, as well as F&B hospitality services. This paper focuses on manufacturing and services.

In 2019, the food & beverage (F&B) industry made the largest contribution of the non-oil and gas industry to the nation's gross domestic product (GDP) and grew by an average of 7.78% annually.

In 2019, the food & beverage (F&B) industry made the largest contribution of the non-oil and gas industry to the nation's gross domestic product (GDP) and grew by an average of 7.78% annually (Ministry of Industry, 2020). In the second quarter of 2021, the F&B industry contributed 6.70% to Indonesia's national GDP, equal to USD 18.57 billion. F&B was also responsible for exports totaling USD 16.94 billion in 2021—a 16% growth from the previous year's exports and representing 7.25% of Indonesia's total exports (Ministry of Industry, 2021; Statistics Indonesia, 2021b).

The F&B industry depends on supplies of intermediate goods from abroad for its material products. Intermediate goods include sugar, soybeans, wheat, garlic, vegetable oils, and flours. In 2019, imports in the F&B industry decreased by an average of 0.1% annually, while annual export growth averaged 0.7%. (Ministry of Trade, 2022).

The economic effects of the Covid-19 pandemic, including reduced demand, supply chain disruptions, mobility restrictions limiting production capacity, and reduced labor force and working hours—both to curb transmission and a reaction to lower demand—severely affected the F&B industry. Despite these challenges, the F&B sector experienced growth during the pandemic, along with the metals, chemicals, and pharmaceutical industries (Statistics Indonesia, 2021a).

Meanwhile, F&B services contributed USD 51.7 billion to Indonesia's GDP in 2019, 4.3 % of Indonesia's total GDP that year (Oxford Economics, 2021). F&B service includes all food-related activities in restaurants and catering. Unlike the broader industry, F&B service experienced a contraction during the the Covid-19 pandemic, and its contribution to GDP declined in 2020 as pandemic restrictions came into effect. In the second, third, and fourth quarters of 2020, F&B services contribution to GDP declined by -21.97%, -11.81%, and -8.88%, from the previous year. When large-scale social restrictions were removed in the second quarter of 2021, the contribution of F&B services to GDP increased by 25.10% compared to the second quarter of 2020 (Indonesia Statistics, 2021c).

The F&B sector in Indonesia is dominated by palm oil and its derivatives. Palm oil is used to make cooking oil, margarine, shortening, vegetable ghee/vanaspati, confectioneries fat, filling/cream, spread fat, filled milk, Cocoa Butter Alternatives (CBE/CBS/CBR) and other emulsifiers. Data used by the government in reporting the growth of the F&B industry does not separate palm oil from non-palm oil activities. This also means that the growth data for the F&B industry reflects the palm oil commodity market more accurately than the F&B manufacturing sector as a whole.

Employment

The Indonesian F&B sector provides vital entrepreneurial and employment opportunities. The F&B sector is responsible for the largest share of employment in Indonesia outside of oil and gas industries. In large and medium size firms, the sector employed around 17.8% of the total workforce, while in micro and small enterprises (MSEs), the share was around 36% in 2019. In the services sector, F&B added 3.6 million new jobs to Indonesia's labor market between 2015 and 2019. This included 600,000 new jobs in the wholesale and retail sectors and 3 million in hospitality (Oxford Economics, 2021).

The F&B sector is responsible for the largest share of employment in Indonesia outside of oil and gas industries.

Table 1.
Share of Employment in Non-oil and Gas Industries

| Industry Names | Medium and Large Firms | | MSEs | |
|--|------------------------|-------|-------|-------|
| | 2018 | 2019 | 2018 | 2019 |
| Food and Beverages | 18% | 17.8% | 40.7% | 36.0% |
| Tobacco Processing | 5% | 4.8% | 9.4% | 14.1% |
| Textile | 10% | 9.3% | 4.3% | 4.9% |
| Apparel | 12% | 12.8% | 11.5% | 11.5% |
| Leather and Leather Goods and Footwear | 6% | 7.7% | 2.1% | 1.5% |
| Wood, Wood and Cork Products Excluding Furniture and Woven Products from Bamboo, Rattan and The Like | 4% | 4.1% | 10.9% | 11.6% |
| Paper and Paper Goods | 2% | 2.4% | 0.2% | 0.2% |
| Printing and Reproduction of Recording Media | 1% | 1.3% | 1.2% | 0.9% |
| Products from Coal and Petroleum Refinery | 1% | 0.3% | 0.0% | 0.0% |
| Chemicals and Articles of Chemicals | 4% | 3.7% | 0.6% | 0.7% |
| Pharmaceuticals, Chemical Medicinal Products and Traditional Medicines | 2% | 1.4% | 0.2% | 0.3% |
| Rubber, Rubber and Plastic Products | 7% | 7.3% | 0.5% | 0.3% |
| Non-Metal Excavated Goods | 3% | 3.4% | 7.3% | 6.8% |
| Metal Base | 2% | 2.1% | 0.2% | 0.1% |
| Metal Goods, Not Machinery and Equipment | 3% | 2.7% | 3.6% | 3.0% |
| Computers, Electronic and Optical Goods | 2% | 2.3% | 0.0% | 0.0% |
| Electrical Equipment | 3% | 2.5% | 0.0% | 0.0% |

| | | | | |
|--|----|------|------|------|
| Machines and Equipment That Cannot Be Classified Elsewhere | 2% | 1.4% | 0.1% | 0.1% |
| Motorized Vehicles, Trailers and Semi-Trailers | 4% | 4.0% | 0.1% | 0.1% |
| Other Transport Equipment | 2% | 2.1% | 0.2% | 0.2% |
| Furniture | 3% | 2.9% | 4.2% | 3.9% |
| Other Manufacturing | 3% | 3.1% | 2.6% | 3.7% |
| Repair and Installation for Machines and Equipment | 0% | 0.5% | 0.2% | 0.2% |

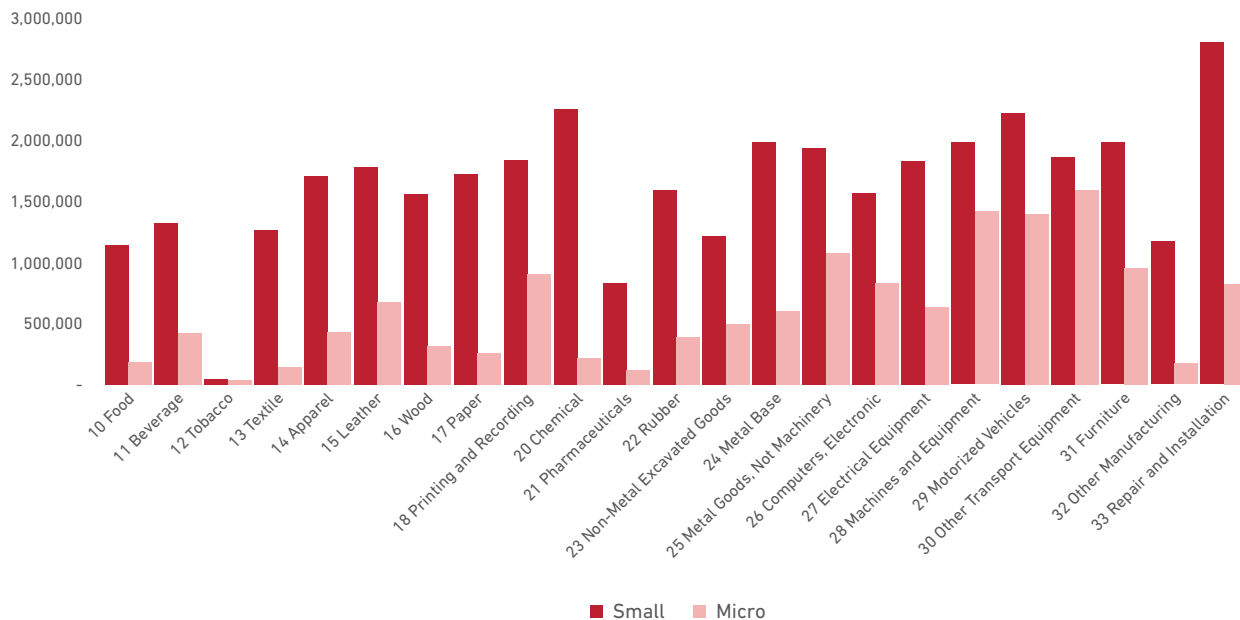
Source: BPS

“Wages in the F&B sector are considerably lower compared to other non-oil and gas industries.”

Wages in the F&B sector are considerably lower compared to other non-oil and gas industries. In medium and large-sized F&B enterprises, workers earned an average monthly wage of approximately IDR 4 million in 2019. This was lower than monthly wages in the chemical, electronic, and automotive industries, and only slightly higher than in the textile industry (World Bank Group & Bappenas, 2020). In MSEs, workers of the F&B sector were also paid less compared to other industries and only higher than those working on tobacco, pharmaceuticals, and non-metal excavated goods. The amounts vary depending on the number of working days. Workers in small enterprises who work for at least 10 days a month can earn around IDR 400,000 while working at least 20 days will generate IDR 1,162,000 monthly wage. Those who work for 30 days a month earn around IDR 1,912,000. In F&B services, workers are paid an average monthly wage of IDR 2.1 million, only slightly higher than wages earned in the agricultural sector (Statistics Indonesia, 2022).

“In MSEs, workers of the F&B sector were also paid less compared to other industries and only higher than those working on tobacco, pharmaceuticals, and non-metal excavated goods.”

Figure 1.
Monthly Wages in MSEs in Non-oil and Gas Industries (2019)



Source: BPS

Female Labor Force Participation

In 2020, only 37.85% of total employees in medium and large-size F&B service enterprises were female. This number applies to formal employment and stands in sharp contrast to the situation in the informal sector.

In medium and large enterprises, 36% of workers in the food industry and 32% in the beverage industry are female. In contrast, female workers make up more than half of workers at MSEs—56% in the food industry and 58% in the beverage industry. Female workers in F&B MSEs are paid less compared to males both because they work fewer hours and because they earn less per hour worked. Many are unpaid workers since they own the business or are a close relative of the business owner.

Despite significant changes in Indonesia's economy over the past ten years, female participation in the labor market has been relatively stagnant. There are several constraints contributing to lower female labor force participation in Indonesia, including educational attainment, marriage, household structure, age, and access to urban regions (Monash, 2017; Cameron et al., 2019). However, female labor force participation is expected to increase in the younger generation (Monash, 2017). The 2012 Indonesia Demographic and Health Survey concluded that in urban regions women have increased their participation in the labor market, while younger women in rural areas have reduced their participation by withdrawing from unpaid and informal work (Cameron et al., 2019).

Female workers in F&B MSEs are paid less compared to males both because they work fewer hours and because they earn less per hour worked.

The gender wage gap is an additional consideration in female labor force participation—the wage gap is 34% in the formal sector and 50% in the informal sector and is reflective of mostly discriminatory practices (Monash, 2017). Using The National Socio-Economic Survey (Susenas), Monash (2017) shows that the probability of becoming informal workers in urban areas for female workers is three times higher than males. The reason is that while males more successfully fill job vacancies in urban areas, females tend to become unpaid workers when they have dependent children. In addition, across all industries in Indonesia, average working hours are consistently higher for men. Excessive working hours, which is considered to be more than 48 hours per week, are performed by 31.8% of men versus 24.5% of women.

Broadly speaking, policies benefiting micro and small F&B enterprises, especially policies that allow them to increase productivity and wages or to formalize their businesses are likely to improve female workplace participation in Indonesia.

Informal Workers

An informal economy is economic activity by workers or economic units that are not covered or sufficiently covered by formal arrangements (Unicef, 2021). They often consist of sole proprietorships and/or family-run businesses that are not registered with the business registration office, municipality, province, or tax authority (Asian Development Bank, 2022). Statistics Indonesia defines informal economic activity as being not registered, small-scale, self-employed with few to no regularly paid employees, operating in 'invisible places' such as households, or entailing no fixed location (Statistics Indonesia, 2022b).

Rothenberg et al. (2016) found that Informal firms in Indonesia tend to pay lower wages and have lower productivity compared to formal firms both in large-medium-sized companies and MSEs. Moreover, women are more likely to be employed as informal workers (ASEAN, 2022). In 2021, approximately 63.80% of the total 51.79 million female workers were employed informally, while out of 79.26 million male workers, only about 56.61% were informally employed (Statistics Indonesia, 2022c).

In the Indonesian F&B sector, the informal economy plays a major role in employment but has low productivity.

In the Indonesian F&B sector, the informal economy plays a major role in employment but has low productivity. Among micro and small sized enterprises (MSEs), 79% in the food industry and 62% in the beverage industry were informal units while 76% of workers in the food industry and 68% of workers in the beverage industry were informal workers in 2020.

Among informal workers in F&B MSEs, a majority were female. The informal sector provides flexible employment for women who want to work close to home (Alatas & Newhouse, 2010).

Among informal workers in F&B MSEs, a majority were female.

The share of informal workers increased during the Covid-19 pandemic, with its effects on industry, food service, and transportation (Kahkonen, 2021). F&B service experienced a huge decline in income. Many restaurants had to close temporarily while others cut their working hours. Although the F&B industry grew during the pandemic, 13% of F&B industry MSEs temporarily closed their operations. The reduction in work hours forced many workers who previously worked in the formal sector to shift to informal work during the pandemic. Females were the most vulnerable to displacement from the formal sector. Women own most MSEs in the F&B industry, but the proportion of women-owned businesses that had to close down (7%) was twice as high as the proportion of those owned by men (3.4%) (UNICEF, UNDP, Prospera, and SMERU, 2021).

Given the importance of the F&B sector to the Indonesian economy and for low-skilled Indonesian employees in particular, the government has developed strategies designed to support the sector, including international trade policies to insulate the sector from foreign competition. However, intermediate goods are important for the F&B industry, and importing them supports exports and production.

GOVERNMENT STRATEGIES FOR THE F&B SECTOR

Mol is the technical ministry responsible for the F&B sector in Indonesia and has both long and short-term industrial strategies to reduce imports of intermediate goods by supporting the development of domestic upstream industries.¹

Government strategies for the F&B sector are outlined in three Mol documents: the 2015–2035 National Industrial Development Master Plan (Rencana Induk Pembangunan Industri Nasional – RIPIN); a roadmap called *Making Indonesia 4.0*; and the Strategic Plan of the Ministry of Industry (Mol) 2020–2024 (Renstra 2020–2024). RIPIN aims to reduce reliance on raw material imports, increase employment in the industries, and stipulates that F&B sector is one of 10 priority industries. In 2019, *Making Indonesia 4.0* identified the F&B sector as a top priority sector and predicted that the Indonesian F&B sector will become the powerhouse of ASEAN F&B by 2030. Renstra aims to reduce raw material imports and increase employment in F&B.

National Industry Development Master Plan 2015–2035 (RIPIN)²

The 2015–2035 National Industrial Development Master Plan, also referred to as RIPIN, concerns the government's role in the development of national industry and emphasizes the government's seriousness in achieving industrial goals (Ministry of Industry, 2016). Its implementation is to be carried out in three stages, in 2015–2019, 2020–2024, and 2025–2035.

RIPIN aims to increase the GDP, exports, and labor forces of industrial sectors while reducing imports of industrial commodities.

RIPIN aims to increase the GDP, exports, and labor forces of industrial sectors while reducing imports of industrial commodities. RIPIN provides guidance for sectoral decision-making in the industrial sector. In addition, RIPIN is used by the provincial governors, rural regents, and city mayors for industrial development planning in their provinces, regencies, or cities.

The motivation behind Mol's desire to increase net exports lies in the belief that the economy would be best supported through the use of domestic raw materials to produce goods that are exported rather than an economy that relies on foreign importation. In order to encourage the use of domestic raw materials over foreign imports, Mol pursues a strategy of increasing barriers to the market for both international suppliers and downstream manufacturers, since domestic manufacturers typically face higher costs for raw materials due to the lack of foreign competition. The goal is to encourage domestic producers to shift away from imports and instead use domestic inputs—a policy known as import substitution. With this protectionist approach, MOI seeks to reduce the reliance on raw material imports from 43.1% in 2015 to 20% in 2035.

¹ Upstream industries focus on the extraction of raw materials that will be used for manufacturing use. In the F&B sector, upstream industries are engaged in the initial processing of agricultural commodities such as flour milling, oil pressing, and cocoa powder that will be further used to produce consumable products.

² RIPIN carries out the mandate of Article 9 of Law Number 3 of 2014 Concerning Industry.

RIPIN also sets targets for quality and quantity of employment in industrial sectors. Mol plans to increase the number of workers in the industrial sector from 15.5 million people in 2015 to 29.2 million people in 2035 through empowering the local upstream industries, such as agriculture and raw materials, and increasing their production. Investment targets for the industrial sector to support these employment goals are to increase from IDR 270 trillion in 2015 to IDR 4,150 trillion in 2035. Mol also plans to enhance the quality of the human resources through education and training, especially in food-related technologies.

Table 2.
Quantitative targets of RIPIN 2015–2035

| No | Targets | Units | 2015 | 2020 | 2025 | 2035 |
|----|---|----------------|------|------|------|------|
| 1 | Contribution of non-oil and gas industry to GDP | Percentage | 21.2 | 24.9 | 27.4 | 30.0 |
| 2 | Contribution of industrial product exports to total exports | Percentage | 67.3 | 69.8 | 73.5 | 78.4 |
| 3 | The number of workers in industrial sectors | Million People | 15.5 | 18.5 | 21.7 | 29.2 |
| 4 | The ratio of workers in the industrial sector to total workers | Percentage | 14.1 | 15.7 | 17.6 | 22.0 |
| 5 | The ratio of raw material imports of the industrial sector to the GDP of the non-oil and gas industrial sectors | Percentage | 43.1 | 26.9 | 23.0 | 20.0 |

Mol has established 10 priority industry groups that it classifies as mainstay, supporting, and upstream industries.³ Food is a mainstay industry. Supporting industries include capital goods, components, auxiliary materials, and industrial services. Finally, upstream industries include agriculture (agro-based upstream industry); basic metal and non-metallic minerals; and the oil, gas, and coal-based chemical industry (Ministry of Industry, 2016).

³ Other mainstay industries include the pharmaceutical industry, cosmetics and health equipment industry; textile, leather, footwear and various industries; transportation industry; information and communication technology (ICT) industry; and power plant industry.

Making Indonesia 4.0

Mol introduced *Making Indonesia 4.0* in 2018 as a roadmap towards Indonesia becoming a global top 10 economy by 2030. The framework is based on the fourth industrial revolution, which has been based on technological advancement. Indonesia aims to increase its net exports by reviving the manufacturing sector in pursuit of this goal. The implementation of *Making Indonesia 4.0* is intended to increase national GDP by 6–7% per annum, create 30 million jobs, and increase the contribution of manufacturing sectors to 25% of GDP in 2030 (Ministry of Industry, 2018).

“*Making Indonesia 4.0 builds on the 2015–2035 RIPIN. Unlike RIPIN's, which classifies 10 priority industries, Making Indonesia 4.0 focuses on only seven priority industries, including the F&B sector.*”

Making Indonesia 4.0 builds on the 2015–2035 RIPIN. Unlike RIPIN's, which classifies 10 priority industries, *Making Indonesia 4.0* focuses on only seven priority industries, including the F&B sector.⁴ These industries were chosen based on their large contribution to Indonesian economic growth and to expected export growth.

Making Indonesia 4.0 aims to make Indonesia the ASEAN F&B powerhouse and the fifth largest player in the global F&B sector in 2030. It involves revamping the upstream sector and enhancing the manufacturing sector through six paths: Improving upstream agri-sector productivity through technology; Empowering MSEs through funding and technology support; Improving supply chain efficiency; Enhancing modern packaged food production through product innovations; Scaling up the industry by leveraging domestic large demand; Increasing exports and becoming the leading regional F&B production powerhouse.

Making Indonesia 4.0 will be implemented in three phases. The first phase (2018–2022) aims to reduce imports of agricultural products and raw materials for manufacturing sectors. During this period, the main export products from Indonesia will be palm oil, rice, chicken, sugar, cocoa, starch, processed seafood, and processed vegetables and fruits. The second phase (2021–2025) aims to expand the export of F&B sectors in ASEAN countries for simple and medium packaging products. In this period, Mol will prioritize commodities like bottled water, noodles, ready-to-drink (RTD) tea, and coffee. The third phase (2026–2030) will target the global market competition with modern and complex packaged products such as baby food and food supplements.

The domination of Indonesia's F&B sector by MSEs will make becoming an ASEAN F&B powerhouse more difficult. MSEs and their workers are vulnerable to global competition, in part because technological adaptation by these firms is low. Another challenge is low productivity in the agricultural sector, which is prone to disruptions of the supply chain of raw materials.

⁴ Other priority industries under *Making Indonesia 4.0* are textile and apparel, automotive, electronics, and the medical equipment industry.

2020–2024 Ministry of Industry Strategic Plan (Renstra)

The Renstra 2020–2024 implements RIPIN stage 2 through initiatives such as the 2020–2024 national medium-term development plan (RPJMN) and *Making Indonesia 4.0* (Ministry of Industry, 2020). RIPIN sets the general strategy for the Mol and identifies 10 priority industries. *Making Indonesia 4.0* narrows its scope to seven priority industries and sets the targets that each industry wants to achieve in the long term. Renstra sets quantitative targets for each industry during the period 2020 and 2024, including the F&B industry.

Renstra 2020–2024 does not separate food industry targets from marine and fishery products, and combines the beverage industry target with tobacco and refreshment products. As a result, it is difficult to single out Mol's specific ambitions for the F&B sector.

Renstra sets quantitative targets for each industry during the period 2020 and 2024, including the F&B industry.

Table 3.
Quantitative targets of Mol's Renstra 2020–2024

| Strategy | Units | 2020 | 2023 | 2024 |
|--|----------------|-------|-------|-------|
| GDP growth of the non-oil and gas manufacturing sector. | Percentage | 5.3 | 7.8 | 8.4 |
| • Food Industry, marine, and fishery products | Percentage | 7.22 | 9.44 | 9.95 |
| • Beverage Industry, tobacco products, and refreshments. | Percentage | 3.29 | 5.40 | 5.77 |
| Number of workers in the non-oil and gas manufacturing sector. | Million People | 19.2 | 21.5 | 22.5 |
| • Food Industry, marine, and fishery products | Million People | 4.89 | 5.58 | 5.89 |
| • Beverage Industry, tobacco products, and refreshments. | Million People | 0.83 | 0.92 | 0.96 |
| Ratio of workers in the non-oil and gas manufacturing sector to total workers. | Percentage | 15 | 15.5 | 15.7 |
| • Food Industry, marine, and fishery products | Percentage | 3.80 | 4.03 | 4.11 |
| • Beverage Industry, tobacco products, and refreshments. | Percentage | 0.65 | 0.67 | 0.67 |
| Export value of non-oil and gas manufacturing products | US\$ Billion | 133.1 | 164.9 | 181.6 |
| • Food Industry, marine, and fishery products | US\$ Billion | 32.93 | 42.53 | 46.52 |
| • Beverage Industry, tobacco products, and refreshments. | US\$ Billion | 3.56 | 4.50 | 4.89 |
| Ratio of industrial raw material imports to the GDP of non-oil and gas sectors | Percentage | 37.80 | 37.00 | 36.80 |
| • Food Industry, marine, and fishery products | Percentage | 3.15 | 3.21 | 3.20 |
| • Beverage Industry, tobacco products, and refreshments. | Percentage | 0.43 | 0.42 | 0.41 |

Renstra expects GDP growth in food industry, marine and fishery products to increase from 7.22% in 2020 to 9.95% in 2024, supported by an increase in export value from USD 32.93 billion to USD 46.52 billion. In 2024, Renstra expects that there will be an additional 1 million workers in these sectors following an increase in manufacturing exports and GDP from these industries. Targets in the beverage industry are similar to the food industry, and an increase in GDP is also expected to follow rising export value and employment.

Even though Renstra is the second-phase implementation of RIPIN, their quantitative targets are different. For example, when RIPIN was drafted, the target ratio of raw material imports to non-oil and gas industries was 26.9% in 2020. However, this figure was adjusted in Renstra to 37.80%. Likewise, while RIPIN set a target to reduce imports of raw materials by 23% in 2025, Renstra adjusted the targets to 36.80%.

RIPIN, *Making Indonesia 4.0*, and Renstra 2020–2024 all neglect the importance of imports and robust participation in global value chains for the development of Indonesia's F&B sector.

RIPIN, *Making Indonesia 4.0*, and Renstra 2020–2024 all neglect the importance of imports and robust participation in global value chains for the development of Indonesia's F&B sector.

⁵ In contrast, finished or later production stage goods are “downstream” of a raw material or intermediate good.

THE IMPORTANCE OF BACKWARD PARTICIPATION IN GLOBAL VALUE CHAINS FOR THE F&B SECTORS

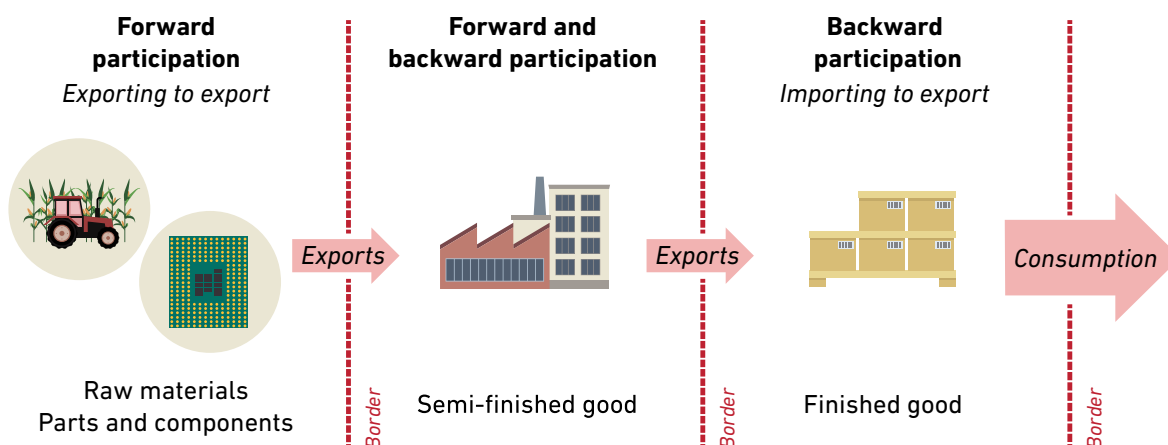
According to OECD, around 70% of global trade takes place as part of a global value chain (OECD, 2020). Firms prefer to join international production networks, in which the components of goods are produced in different countries, rather than building domestic supply chains.

Global value chain involvement can be categorized as forward participation of backward participation (World Bank, 2020). Backward global value chain participation (also referred to as foreign value-added content of exports) is the value added by imported inputs that will be used to produce either intermediate goods or final goods for export (WTO). Countries with few natural resources or little land to produce agricultural products are able to produce manufactured food products through backward participation—that is, by sourcing raw materials from other countries, or “importing to export”.

Global value chain involvement can be categorized as forward participation of backward participation (World Bank, 2020).

A country is said to join the global value chain through forward participation when most of its domestic products are used to produce other countries' exports. Countries that engage in forward participation in the global value chain are more likely to be exporters of natural resources for use as inputs in the importing country (Amanta & Gupta, 2022).

Figure 2.
Global Value Chain Linkages



Source: World Bank

In Indonesia, even though both forward and backward participation in global value chains are declining, forward participation was consistently higher than backward participation, meaning Indonesian exports were relatively more likely to act as inputs in foreign production than finished goods for export. Between 2000 and 2017, forward global value chain participation declined from 21.5% to 12.9% of total value-added of the final product, while backward participation declined from 16.9% to 10.1% during the same period (ADB, 2019).

“Weaker backward participation is the result of government strategy of supporting upstream—agricultural and natural resource—industries through a protectionist policy of import substitution.”

Weaker backward participation is the result of government strategy of supporting upstream—agricultural and natural resource—industries through a protectionist policy of import substitution.⁵ This strategy limits imports of intermediate goods, especially in low-technology manufacturing sectors such as F&B, tobacco, rubber, textiles, and leather. Weaker backward participation implies that intermediate inputs needed for final production will be sourced domestically, causing the foreign value-added in the production process to fall. Between 2000 and 2017, domestic value added contributed to over 90% of Indonesia’s gross exports. On the other hand, foreign value-added made up 13.2% of gross exports by Indonesia’s industrial sectors in 2017 (ADB, 2019).

Intermediate Industrial Inputs

Global value chain participation can facilitate firms’ access to networks, supplies, knowledge, and technology. The resulting boost in manufacturing activities in turn supports economic development—global value chains are associated with economic growth, greater employment, and better jobs in more productive manufacturing activities. These, in turn, reduce poverty (World Bank, 2020).

Employment

Backward participation in global value chains allows a country’s firms to import intermediate inputs from abroad. When input tariffs are lower, the intermediate goods may be cheaper than locally produced intermediate goods (Kis-Katos & Sparrow, 2015). Kis-Katos and Sparrow (2015) also show how trade liberalization increases labor force participation. A reduction of tariffs on inputs will reduce the cost of intermediate goods and allow firms to produce better quality outputs. As firms become more competitive, they become better able to create jobs and retain workers. They find that trade liberalization has a strong effect on improving labor force participation and that this effect is most noticeable for those with primary education and generally stronger for less educated than more educated workers.⁶

⁶ Kis-Katos and Sparrow (2015) find that a one standard deviation decrease in input tariff reduces the average drop in work participation by about 77% of its standard deviation. For those with no education the effect is 72%, for those with complete primary education the effect is 156% of its standard deviation. For the middle education category (junior high school) it again decreases in both size and statistical significance, while it is not statistically significant for the highest educational category.

Female labor Force Participation

Backward participation in global value chains increases female labor force participation when the benefits of expanded access to foreign goods are felt by female-intensive sectors, such as the F&B sector.

Differences in the share of female workers across sectors leads to differences in how tariff reductions affect female labor force participation. Firms may also import capital goods, for instance those that can assist with physically demanding work and level the playing field between male and female workers' ability to do certain jobs.

Kis-Katos et al. (2018) identify gender specific effects of trade liberalization in the labor market and domestic duties in Indonesia. They conclude that input tariff reductions lead to increased workforce participation and work hours for women. Input tariff reductions also increased the share of women who work more than 30 hours per week and reduced the number of women whose domestic duties are their primary activity. This occurred as women were able to shift into market work, rather than working marginal hours while considering domestic duties as their primary activity.

“Input tariff reductions lead to increased workforce participation and work hours for women.”

Wages

Backward participation in global value chains increases wages if lower tariffs on input products lower production costs. Falling production costs combined with better quality products that come with foreign competition (either because imported goods are better quality or because domestic goods improve to compete) allow firms to become more productive and more profitable, positively affecting employee wages. More productive firms are also more competitive in the global market, increasing their likeliness to produce for export. Amity and Davis (2009) find that productive firms are more likely to become exporting firms and tend to pay higher wages. They also find that wages vary greatly by the type of firms: exporter firms pay 28% higher wages, importers pay 47% higher wages, and firms that do both pay 66% higher wages.

The wage skill premium is the difference between the wage of production workers relative to nonproduction workers. A greater wage skill premium tends to be associated with high inequality. Amity and Cameron (2012) investigated the impact of trade liberalization on the wage skill premium in Indonesia. They find that a reduction of input tariffs can decrease the wage skill premium within firms that import intermediate goods. A 10 percentage point cut to input tariffs reduces the skilled wage premium by 4.5% in importing firms. This effect is stronger for importers with a larger import share. For importers with an import share in the 90th percentile, a 10 percentage point cut to input tariffs results in an 8.4% fall in the wage skill premium.

“Falling production costs combined with better quality products that come with foreign competition (either because imported goods are better quality or because domestic goods improve to compete) allow firms to become more productive and more profitable, positively affecting employee wages.”

The intuition behind the negative effect of intermediate goods imports on the wage premium is as follows: Intermediate goods production in Indonesia typically requires highly skilled labor

compared to producing final goods (Amiti and Cameron, 2012). High skilled labor is more expensive, making it more likely firms will find it cheaper to import it. At the same time, allowing firms to more easily import intermediate goods can also put their priority on the production of final goods, which require more low-skilled labor. Increasing demand for low-skilled labor puts upward pressure on the wages of low-skilled labor.

Intermediate Inputs for F&B Sectors

Most intermediate inputs in F&B manufacturing are agricultural products such as grains, salt, sugar, and animal protein that require specific climate and geographical settings to be produced competitively (Scoppola, 2021). Compensating for inappropriate climate and geographical settings is more difficult and costly compared to other assistance such as finance and human resource improvements. Consequently, producing high quality, high value added F&B products requires Indonesia to import food inputs from other countries.

Amanta and Gupta (2022) found that Indonesian exports of F&B products are dominated by palm oil and its derivatives instead of downstream final goods like instant noodles or biscuits. Palm oil and its derivatives require little to no foreign sourcing. Not separating palm oil and its derivatives from the rest of the industry masks the importance of imported inputs in final goods production in

“Not separating palm oil and its derivatives from the rest of the industry masks the importance of imported inputs in final goods production in the F&B sector.”

the F&B sector. Unless palm oil is disaggregated from F&B production, the government might form the mistaken assumption that imported intermediate goods are not important to Indonesian F&B production.

Palm oil is itself an intermediate input, which is why palm oil producers may narrowly benefit from protectionism. For example, palm oil can be used in instant noodle production to fry the dough, and so tariffs to block imports of intermediate inputs may encourage Indonesian firms to use Indonesian palm oil in this process. But even if Indonesian palm oil is the best ingredient to fry the dough, Indonesian instant noodle production also needs other ingredients such as wheat, salt, garlic,

and chili powder, all largely imported products, and are likely to be harmed by a policy broadly aiming to reduce imports.

Once palm oil is taken out of the analysis, it becomes clear that backward participation in global value chains is important for Indonesia's F&B manufacturing. Using imports and exports of intermediate goods and final goods of the F&B Sector, Amanta and Gupta (2022) found that an increase in intermediate input import growth by 1% is associated with an increase in export growth by 0.96%. Because Indonesia's domestic consumption is so high, this number is non-trivial—a large fraction of the improved production will likely be consumed domestically. This finding also resonates with other research such as Pane and Patunru (2022) who found importing inputs of greater value raised the productivity and export capacity of Indonesian manufacturing firms. Additionally, access to better quality intermediate inputs may also help firms sell to lucrative international markets with higher food safety standards, such as the U.S. and the EU.

The results from Amanta and Gupta (2022) suggest that reducing imports of intermediate goods will likely harm the F&B industry. Mol's goals are therefore not compatible, since decreasing

imports are likely to decrease F&B industry growth and employment. Mol may believe that import substitution can help F&B because the data aggregate palm oil with the rest of the F&B industry. If Indonesia is content to rely on palm oil and its derivatives, or other upstream agricultural products, import substitution may be less damaging. However, agricultural products have more volatile prices compared to final goods such as instant noodles and biscuits.

Changing strategies to support agricultural and natural resource industries that are less obviously damaged by protectionist policies is also not compatible with Indonesia's development of its manufacturing industries and diversification beyond commodity exports.

LINKING MSEs PERFORMANCE WITH IMPORT OF INTERMEDIATE INPUTS IN THE F&B SECTOR⁷

Indonesian data lumps together palm oil and its derivatives with the F&B industry, masking the importance of imported intermediate inputs to F&B manufacturing and other downstream industries, we focus on micro and small sized firms in the F&B industry. This is because palm oil and vegetable oil are capital intensive goods, the production of which benefits from economies of scale. Palm oil and vegetable oil manufacturing is therefore likely to be undertaken by large firms (Muhid, 2022). Based on this assumption, although we cannot disaggregate the data to remove palm oil, focusing on micro and small sized firms should exclude much of the palm oil data.

“Focusing on micro and small sized firms should exclude much of the palm oil data.”

Focusing on smaller firms, we can also see the direct impact of imported intermediate inputs for Indonesian smaller firms, which employ the majority of Indonesian workers and entrepreneurs in the F&B industry. Smaller firms also tend to employ more female and informal workers, as discussed in the previous chapter.

Melitz (2003) suggests that impacts of trade are different on firms within the same industry depending on the efficiency and the size of the firms. More efficient firms will become more productive with trade liberalization and enter the export market, while less efficient firms will be forced to exit the market. Moreover, smaller firms experience larger effects from changes in trade policy than large ones. We estimated the effect of imported intermediate inputs on the F&B industry, differentiated by firm size. (Please refer to the appendix for more detailed documentation on the methodology).

For small firms in the F&B industry, we estimate that a 1% increase in imported intermediate inputs is followed by an increase by 2.73% output the following year. In micro firms, a 1% increase in imported intermediate inputs is followed by a 4.53% increase in output the following year. Value added of the industry increases even more than output, by 3.25% for small firms and 4.92% for micro firms. This increase could be the result of imported inputs providing access to cheaper and/or better quality materials, which could allow more firms to enter the market or allow existing firms to become more productive.

Analyzing the data based on the number of firms and based on the number of workers shows that a 1% increase in imported intermediate input is followed by an increase in the average value added per firm by 4.52% among small firms and 4.01% among micro firms the following year. For value added per worker, the number is 4.5% for small firms and 4.09% for micro firms. This suggests that imported intermediate inputs allow existing firms to become more productive.

⁷ A more technical discussion of this section is included in the Appendix.

⁸ Note that the per worker and per firm number is much higher for small firm industries relative to the value added of the industry. The number of firms in the small firm industries is more volatile than the micro firms (see appendix). It is possible that the exit and entry of the small firms are more volatile (either they often graduate to medium sized or demoted to micro sized).

Examining the relationship between imported intermediate inputs and the average wages in micro and small sized firms, we find that a 1% increase in imported intermediate inputs is followed by an increase in the average wage by 4.4% for small industries and 5.07% for micro industries the following year.

The results of our research also show that, at the margin, changes in imports of intermediate goods have no effect on the number of companies and the number of workers in small and micro enterprises in the F&B sector. In terms of the number of workers, the labor movement in small and micro businesses is quite dynamic, and it is easy for employees to transfer from the formal to the informal sector, which is the reason for this lack of relevance. In terms of the number of firms, more imports do not create more firms but make the existing businesses and their workforces more efficient and productive, thereby increasing their wages.

Our results show that access to imported intermediate inputs lowers production costs, allowing firms to become more productive and increase profitability and the wages of their workers. More productive firms are also more competitive in the global market, and so more likely to become exporters.

The larger effect of imported intermediate inputs on micro and small sized enterprises may reflect their limited capability to adapt to changes in trade policy. Small firms typically do not import their own goods and are price takers in the domestic market—in other words, they are unlikely to directly purchase imports based on lower international prices, but instead take advantage of imports available in the market at the price offered by importers (Gupta, 2021; Pane & Patunru, 2021). To shift Indonesia's economy away from reliance on volatile commodity prices and to improve domestic value added to the F&B industry, imported intermediate inputs should not be discouraged.

Our analysis found no significant effect of imported intermediate inputs on larger firms, supporting our assumption that these firms are more likely to be dominated by palm oil and its derivatives, which require fewer intermediate goods and are less likely to be affected by policy changes affecting imports. This further demonstrates the importance of separating palm oil derivatives from other F&B sectors in general when collecting and using data describing the Indonesian F&B industry.

No significant effect of imported intermediate inputs on larger firms, supporting our assumption that these firms are more likely to be dominated by palm oil and its derivatives.

These findings have implications for the Indonesian government's strategy to grow the F&B sector in terms of GDP contribution, exports, employment, and wages, which we discuss in the next section.

⁹ Note that the labor and labor cost numbers are aggregated from micro and small firms. These numbers may not tell the whole story since many micro and small firms employ no labor.

EFFECTIVENESS OF CURRENT POLICIES

Indonesia's government aims to develop the F&B sector in terms of output growth, export, and employment in Indonesia using two types of policies. First, policies affecting the import process such as non-tariff measures and the Commodity Balance (Neraca Komoditas) policy. Second, as already discussed, Ministry of Industry (Mol) policies to strengthen upstream industries by discouraging imports of intermediate goods for the manufacturing sector.

Importing some intermediate F&B products may involve more than one technical ministry. For example, importing salt will involve the Ministry of Marine Affairs and Fisheries and the Ministry of Industry, while importing sugar, garlic, beef, and other spices for industrial use will involve the Ministry of Agriculture (MoA) and the Mol.

Annual import quotas are determined during the annual meeting with the Coordinating Ministry for Economic Affairs. Technical ministries do not always agree with each other because they represent different interests and often use and present different data sets. For example, the Ministry of Marine Affairs and Fisheries will try to limit salt imports for the benefit of domestic salt farmers, while the Mol will argue for higher salt import quotas in order to meet industrial demand. Once set, annual quotas are forwarded to the Ministry of Trade (MoT).

The quota system and lower imports leads to consistently higher prices compared to the world market for essential food products (Fane & Wart, 2008). The quota system also encourages rent-seeking and corruption. Again using salt imports as an example, corruption occurs as some officials from Mol set up the import quota higher than what was actually needed by industries (Dirgantara, 2022). In addition, there were several corruption cases including fee levies in the case of garlic imports (Aryan, 2022), corruption in importing beef (Patunru and Rahardja, 2015), bribery in sugar imports (Persada, 2020), corruption in the export of lobster seeds (Nindita, 2021), and a crude palm oil export corruption case (Ni'am, 2022), all involving quota procedures for both import and export.

The new Neraca Komoditas system in Indonesia may reduce corruption and speed up the import process. Importing companies can directly input their annual import needs through SNANK (National Commodity Balance System), a subsystem of the Indonesian National Single Window, under this system (INSW). As a result, this system can increase transparency while also eliminating one step in the import license application process; ministerial recommendation letters for importers (Gupta, Pane & Pasaribu, 2022).

Neraca Komoditas has regulated 24 commodities, five of which are raw materials for the F&B sector: rice, salt, sugar, beef, fishery, and corn. The implementation, however, has some ambiguities.

Neraca Komoditas has regulated 24 commodities, six of which are raw materials for the F&B sector: rice, salt, sugar, beef, fishery, and corn. The implementation, however, has some ambiguities. First and foremost, the system is heavily dependent on supply and demand data. There will be no imports if domestic supply exceeds demand. As a result of this approach, the importance of price and quality, which are frequently cited as the primary reasons for company

imports, may be diminished. Second, the data used to calculate import quotas is frequently inaccurate, which remains a point of contention among ministries.¹⁰ Third, the government-approved import quotas may be lower than the importer's proposal, and there is no clear explanation for how these quotas are calculated and allocated to firms.

Mol's RIPIN 2015–2035, *Making Indonesia 4.0*, and Renstra 2020–2024 all seek to reduce the reliance on imported intermediate goods. The intention is to develop upstream industries based on natural resources through the adoption of cutting-edge technology in the agricultural sector, increase Indonesia's position in both domestic and foreign markets, and increase exports of industrial products.

As we have seen, reducing imports to protect upstream industries is a harmful policy for Indonesia's F&B sector. Indonesia's 54.8 million agricultural workers, whom policies discouraging imported industrial inputs are designed to help, disproportionately live below or just above the poverty line. However, imports not only shelter the agricultural sector from foreign competition, they also make the price of food in Indonesia higher. Higher food prices disproportionately harm the poorest Indonesians, including agricultural workers. In the case of limits on rice imports, most Indonesians, including farmers in rural and low-income areas, are net consumers of rice and so they pay more than they earn from the higher price of rice caused by import restrictions (Patunru and Ilman 2019). In general, efforts to limit imports not only limit the growth of the F&B sector but risk harming the very people they're designed to help.

In general, efforts to limit imports not only limit the growth of the F&B sector but risk harming the very people they're designed to help.

One argument is that the government's policy aims to reduce exposure to uncertain global markets. But relying only on the domestic market does not guarantee stability. In January 2014, floods in Java, Sulawesi, Sumatra, Nusa Tenggara and Kalimantan wiped out 400,000 hectares of rice fields with an estimated total loss of IDR 1.2 trillion. The long drought in 2015 and early 2016 forced farmers to delay rice planting for up to three months. In both cases, easier access to imports would have stabilized available supply despite disruptions to domestic demand.

There are better ways to support farmers through domestic rather than international trade policy. Glorya and Nugraha (2019) suggest several interventions to improve farmer welfare including training on how to access financial services, incentives to improve product quality through quality management programs, and contract farming to ensure price stability and improve relations between farmers and other actors in the supply chain.

¹⁰ In the case of corn imports in 2015, there was a difference in the MoA data, which suggested that there was a surplus of 3 million tons of corn in Indonesia, and data from Coordinating Ministry for Economic Affairs that said Indonesia experienced a 1.5 million tons of corn deficit in 2015 (Fauzi, 2016). Similarly, MoA reported a rice surplus in 2018, while MoT reported that rice at that time experienced a deficit (Patunru and Ilman, 2019). It is unclear how Neraca Komoditas improves the accuracy of the data collection mechanism on these goods

Patunru and Respatiadi (2017) also suggest a number of targeted programs to assist farmers in improving their welfare. Some of them are conditional cash transfer programs (Program Keluarga Harapan/PKH) as well as assistance for health costs (Kartu Indonesia Sehat/KIS) and education (Kartu Indonesia Pintar/KIP). These programs are more effective because they directly target those who are less able to finance their health and education needs. Meanwhile, the agricultural insurance program (Padi Farmer Business Insurance/AUTP) can reduce the risk of lost income due to crop failure (Patunru and Respatiadi, 2017).

Trade policy does not improve domestic agricultural productivity. In fact, it reduces productivity by encouraging low wage farming activity. A better strategy for improving productivity would be to prioritize improving the seed distribution program (Freddy & Gupta, 2018), fixing the inefficient fertilizer subsidy program (Kompas, 2022), and improving bottlenecks in investment in farming activities as well as knowledge transfers between farmers and foreign investors (Budiman and Alta, 2022).

“Reliance on palm oil and its derivatives makes it difficult for the F&B industry to access European markets, which discriminate against Indonesian palm oil because of the negative effects of its production on the environment.”

Thanks to Mol policies emphasizing upstream industry, Indonesian reliance on palm oil is increasing. Reliance on palm oil and its derivatives makes it difficult for the F&B industry to access European markets, which discriminate against Indonesian palm oil because of the negative effects of its production on the environment (Neo, 2022). In this way, limiting imports to support the palm oil sector makes it difficult for other F&B players to expand into export markets.

Amanta & Wibisono (2021) suggest that limiting trade through non-tariff measures also damages the welfare of low-income families. Since foreign goods are only purchased if they are the best option, trade can give consumers access to more affordable food, it is expected that under liberalized trade low-income families can spend less while maintaining their level of consumption. Trade is also linked to the diversity of food supply because different types of food will be available to consume when trade is open (FAO, 2016). Hence, limiting trade, whether through tariffs or non-tariff measures, also limits access to more varied and healthier diets. Further, trade restrictions can lead to retaliation by other countries that further increase prices.

Indonesia's weak backward participation in global value chains

Indonesia's economic policy has become more protectionist since at least the late 2000s (Patunru and Rahardja, 2015; Patunru, 2018; Pane and Hill 2018). Mol's latest goal is to reduce imports not only for the F&B sector but the manufacturing sector in general (Gupta, Gretton & Patunru, 2022). This has resulted in lower than optimal backward participation in global value chains.

Weak backward participation in Indonesia is rooted in the decline of foreign inputs in Indonesia's export products, poor performance of micro and small enterprises (MSEs), and participation in the global value chain that is defined by single-crossed border rather than multiple-crossed border engagement.

The role of foreign inputs in Indonesian export products is decreasing both in low and medium-high technology industries. More than 80% of the intermediate goods used in Indonesian production was sourced domestically between 2000 and 2017 (ADB, 2019). Raw materials for low technology industries such as F&B, rubber, textile, and plastics come from domestic natural resources, a result of MoI protectionism. Between 2005 and 2015 the oils and fats industry used mostly local oil palm inputs, causing the share of intermediate input import embedded in the exported products to decrease from around 12 percent to 8 percent. This decline limits industrial access to cheaper intermediate goods and at the same time eliminates their opportunity to produce higher-quality products.

Backward participation in the global value chain is also low because micro and small enterprises (MSEs)—especially in the F&B sector—have problems exporting their products (Ahmad, 2021). Even though they represent a large number of firms, only 14.4% of total export in Indonesia was contributed by MSEs in 2019 (MSCO, 2020). In general, MSE products struggle to meet the quality and product safety requirements of international trading partners.

Improving product quality requires financing, especially investment in technology and human resources. MSEs in Indonesia often find it difficult to get access to credit from banks. In March 2020, only 19.68% of banking credit could be accessed by MSEs while the rest could be accessed by medium and large companies (Ahmad, 2021). MSEs are less likely to have access to the collateral required by the banks. In addition, many MSEs do not have formal business plans and other documents needed to apply for bank loans and establish creditworthiness (Ahmad, 2021).

Finally, Indonesian global value chain participation commonly involves single-crossed borders (simple GVC) rather than multiple-crossed borders (complex GVC) (ADB, 2019). This means that a larger portion of Indonesia's domestic value-added was used by its direct importers to produce their final products for domestic consumption rather than to re-export them to a third economy. More than half (58%) of backward global value chain participation was simple GVCs, again indicating the value-added embedded in Indonesia's intermediate imports were used in final production for domestic consumption rather than for export. It limits firms from enjoying the benefit of export such as higher prices in the foreign market, market expansion, and consumer diversification.

CONCLUSION AND POLICY RECOMMENDATIONS

The F&B sector plays a critical role for Indonesian GDP growth, exports, wages, employment, and female labor force participation. As a result, the F&B industry has become a priority sector for the Ministry of Industry. Although most intermediate inputs for F&B sectors are sourced domestically, imports of intermediate inputs remain important. Access to imported intermediate inputs allows firms to rely on cheaper and better quality raw materials, in turn increasing productivity and boosting exports.

Our investigation shows that while it has no impact on the number of firms and employment, intermediate input imports have positive effects on wages, output, value added, value added per firm, and value added per worker among micro and small enterprises. No impact on the number of firms means that imports do not create new firms but make existing firms and their workers in MSEs more competitive and efficient. Additionally, the lack of an effect on employment suggests that labor movement in MSEs is quite dynamic, with employees easily transitioning from the formal to the informal sectors, explaining the lack of relevance.

However, importing intermediate goods is unpopular with the Indonesian government. Mol has been working to gradually decrease reliance on imported intermediate goods in the F&B sector through policies discouraging imports—in other words, through import substitution. Rather than support the F&B industry, this approach will likely undermine it. Moreover, it will increase Indonesian reliance on palm oil derivatives, increasing the effect on the Indonesian economy of volatile commodity markets and limiting downstream industries' access to foreign markets. Because of the importance of the F&B industry to the Indonesian economy, Mol's policies limiting access to imported intermediate inputs must be addressed.

POLICY RECOMMENDATIONS

- The government should revisit the policy of import substitution in food production. If the government wants to improve F&B manufacturing, it should encourage more imports of intermediate inputs, not less.
- The government should study on the impact of trade policy on F&B manufacturing. We are not aware of any study conducted to support the reasoning behind its import reduction targets. The government must at least provide a rationale for pairing import reduction targets with F&B industry growth, for as it stands, these two goals are contradictory, particularly for micro and small enterprises. This paper provides preliminary findings suggesting that the government's current approach creates risks to the industry instead of helping it. Better quality data is needed to provide more comprehensive insight.
- In its data collection and presentation, the government should separate palm-oil derivatives from other parts of the F&B industry. Aggregation of palm oil with the broader F&B sector may have misled the government, causing them to underappreciate the importance of imports for the sector's health and growth.
- The government should improve its capacity for data collection and expertise in the data dissemination process. Despite the previously excellent quality of in particular the Survey Industri (SI) database, or Industri Besar Sedang survey (IBS), Márquez-Ramos (2020) and our own experience (see appendix) suggests there is a growing problem in the quality of the SI/IBS database and access to its data (see Appendix).
- The government should conduct a real-time evaluation of Neraca Komoditas and its domestic downstream policies and ensure the findings are shared with the public. In addition, limiting trade is not the first best way to help upstream industries.
- The government should directly pursue the stated goals of its protectionist policies through domestic policies, rather than indirectly trying to influence them through trade policy. These might include improving technology, human capital, and knowledge transfer, improving production data collection, other productivity-enhancing policies, and direct wealth transfers.

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APPENDIX

To study the relationship between Indonesia's intermediate input imports and the performance of F&B industry employment and wages, the intermediate input data is gathered from the UN COMTRADE database using BEC Rev. 4 classification for intermediate input in the food industry (Amanta and Gupta, 2022). The abundance of trade data and classification systems allow for a more granular level of analysis. That is, trade data allows analysts to separate certain goods like palm oil derivatives from group goods, intermediate inputs, and final goods. However, evidence from only trade data is suggestive at best, especially for a country with a relatively large domestic market like Indonesia. More robust evidence requires highly disaggregated industry data and even firm level data (Antras, 2020).

For the information on the food and beverage industry, this paper uses freely available data from Statistics Indonesia or Badan Pusat Statistik (BPS). BPS provides industry level data of, among others, output, value added, labor costs, number of firms, and number of workers. This information is aggregated from its annual firm survey called Survey Industri in ISIC 2-digit level of aggregation (Márquez-Ramos, 2020). With this level of aggregation, we can observe food and beverage industries.

The problem with this aggregation is that we cannot exclude palm oil manufacturing from the dataset. Since palm oil derivatives dominate the food industry and vegetable oil manufacturing requires very little in the way of intermediate input imports, the importance of imported intermediate input to the non-palm oil food industry is masked.

The second-best approach is to estimate the relationship between intermediate input imports to micro and small-sized enterprises. Vegetable oil manufacturing is a relatively capital-intensive industry with a low margin that benefits from economies of scale and therefore nearly half of the market is occupied by the four largest companies (Muhid, 2022). We assume that vegetable oil production plays a much smaller role in micro and small-sized firms, and that the impact of imported intermediate inputs will be strong enough in aggregate in that size of industries.

Since Melitz (2003), economists have researched the heterogeneous impact of trade on firms and found that trade impacts are tremendously different between smaller, less productive and larger, more productive firms. Smaller firms have a harder time adapting to trade policy volatility while larger firms are better able to navigate trade restrictions. Gupta (2021) shows this for the Indonesian case.

Table 4.
Aggregated food and beverage industry's data for micro and small sized firms in billion IDR.

| Year | Number of Firms (in 1,000 units) | | Total number of Labor (in 1,000 people) | | Total Output | | Total Value Added | | Total Labor Cost | |
|------|-------------------------------------|-------|--|---------|--------------|---------|-------------------|--------|------------------|-------|
| | Small | Micro | Small | Micro | Small | Micro | Small | Micro | Small | Micro |
| 2010 | 49 | 911 | 351 | 44,244 | 18,155 | 44,244 | 12,219 | 28,783 | 1,879 | 1,873 |
| 2011 | 120 | 905 | 932 | 11,035 | 15,346 | 11,035 | 4,412 | 3,976 | 1,347 | 362 |
| 2012 | 73 | 923 | 609 | 55,135 | 40,731 | 55,135 | 14,792 | 19,515 | 5,688 | 5,926 |
| 2013 | 161 | 1,054 | 1,263 | 76,679 | 120,725 | 76,679 | 36,986 | 23,869 | 14,854 | 5,252 |
| 2014 | 74 | 1,169 | 584 | 100,689 | 76,414 | 100,689 | 18,966 | 33,345 | 5,117 | 3,912 |
| 2015 | 95 | 1,519 | 749 | 138,838 | 113,161 | 138,838 | 30,443 | 49,738 | 8,488 | 6,241 |
| 2017 | 73 | 1,600 | 584 | 132,902 | 63,439 | 132,902 | 18,546 | 52,727 | 6,073 | 6,768 |
| 2018 | 62 | 1,794 | 449 | 166,686 | 54,953 | 166,686 | 17,112 | 54,989 | 5,151 | 6,908 |
| 2019 | 43 | 1,643 | 348 | 141,343 | 62,382 | 141,343 | 15,332 | 56,491 | 4,836 | 7,642 |
| 2020 | 53 | 1,559 | 401 | 119,050 | 54,913 | 119,050 | 16,474 | 46,415 | 5,278 | 6,271 |

Source: BPS

We use an Autoregressive Distributed Lag (ARDL) (Pesaran and Smith, 1995; Pesaran, Shin and Smith, 2001) estimation to evaluate the impact of imported intermediate inputs on the food industry aggregated from micro and small sized firms. We use total output of the industry, total value added of the industry, average value added per firms, average value added per worker, and average wage of the industry as our dependent variable. The sole independent variable is imported intermediate inputs. All variables are log-transformed. We use R software to run the ARDL using the ARDL package (Natsiopoulos & Tzeremes, 2022a Natsiopoulos & Tzeremes, 2022b).

We ran the ARDL for F&B industries aggregated from large and medium firms, small firms, and micro sized firms. We find no significant effect of changes in imported intermediate inputs on large and medium sized enterprises, as we expected because of our assumption that palm oil dominates among firms of this size. On the other hand, we find statistically significant results from one year lagged impact of imported intermediate inputs on the five dependent variables—an increase in imported intermediate inputs correlates with an increase in output, value added, and wages one year later. We summarize these results in Table 5.

Table 5.
ARDL coefficients for micro and small sized firms on selected variables.

| Variable | Small Firms | Micro Firms |
|------------------------|-------------|-------------|
| output | 2.73 | 4.53 |
| employment | -1.30 | 0.36 |
| no of firms | -1.25 | 0.33 |
| value added | 3.25 | 4.92 |
| value added per firm | 4.52 | 4.01 |
| value added per worker | 4.5 | 4.09 |
| wage | 4.4 | 5.07 |

For small firms in the F&B industry, a 1% increase in imported intermediate inputs is followed by an increase in output of 2.73% in the following year. An increase in imported intermediate inputs by 1% is followed by a larger 4.53% increase in output of the micro firms in the following year. Value added of the industry increases even more than output, by 3.25% for small firms and 4.92% for micro firms.

These increases may be driven by an improvement in extensive margins, in which more firms can enter the market to produce F&B products, or by an improvement in intensive margins, which means each firm becomes more productive. To check this effect, we use value added per firm and per worker. We find improvements in intensive margins. A 1% increase in imported intermediate inputs is followed by a 4.52% increase in the average value added per firm among small firms and 4.01% among micro firms the following year. For value added per worker, the numbers are 4.50% for small firms and 4.09% for micro firms.¹¹

Finally, we examine the relationship between imported intermediate inputs and the average wages of micro and small sized firms. We find that a 1% increase in imported intermediate inputs is followed by a 4.4% increase in the average wage for small industries and 5.07% for micro industries the following year.¹² Access to imported intermediate inputs lowers production costs and provides access to better quality inputs, allowing firms to increase profitability and wages. Increased productivity also increases competitiveness in the global market, increasing the chances that these firms will become exporters.

¹¹ Note that the per worker and per firm number is much higher for small firm industries relative to the value added of the industry. The number of firms in the small firm industries is more volatile than the micro firms (see table 4). It is possible that the exit and entry of the small firms are more volatile (either they often graduate to medium sized or demoted to micro sized).

¹² Note that the labor and labor cost numbers are aggregated from micro and small firms. These numbers may not tell the whole story since many micro and small firms employ no labor.

wages. Increased productivity also increases competitiveness in the global market, increasing The lagged impact of intermediate inputs on micro and small sized enterprises may reflect their limited capability to adapt to changes in trade policy. Smaller firms are impacted more severely by trade policy than large firms (Melitz, 2003; Gupta, 2022). In our case, small firms typically do not import their own goods and are price takers in the domestic market.

Our results support the argument made by Amanta and Gupta (2022) that the benefits of imported intermediate inputs accrue largely to the domestic economy. These impacts are non-trivial, especially for micro and small enterprises in the F&B industry. We complement evidence found in existing literature regarding the benefit of imported intermediate inputs for the Indonesian manufacturing industries (Kis-Katos & Sparrow, 2015; Kis-Katos, Pieters & Sparrow, 2018; Pane and Patunru, 2021; Amiti & Konings, 2007; Amiti & Davis, 2012; Gupta, 2021).

Moreover, our results confirm the importance of separating palm oil derivatives from other F&B sectors when analysing the Indonesian F&B industry. Palm oil is an extremely large industry with little need for imports. Moreover, palm oil is an upstream industry. In more downstream parts of the F&B industry, imported intermediate inputs are more important, and palm oil ceases to be the most important variable. For example, palm oil can be used in instant noodle production to fry the dough, but instant noodle production also needs other ingredients such as wheat, salt, garlic and chili powder, all largely imported products.

To reduce the importance to Indonesia's economic of exposure to volatile commodity prices, and to improve domestic value added to the F&B industry, one must look into the more granular level of the industry instead of just a F&B industry aggregate (that is, ISIC-2-digit level) as the character of the industries (especially the more downstream ones) can be varied.

Data

Indonesia has one of the better firm-level databases in the developing world, named Survey Industri. The Survey Industri allows for economic research in the Indonesian manufacturing industry (Marquez-Ramos, 2020). Survey Industri is the product of the nation's authority for data collection and dissemination named Badan Pusat Statistik (BPS). On its website, BPS provides substantial aggregated information on the Indonesian manufacturing industry, which is easily accessible for everyone. This information includes output, value added, labor payment (wages), and number of workers, all aggregated in a ISIC-2-digit level of aggregation, or Indonesia Standard Industrial Classification (*Klasifikasi Baku Lapangan Usaha Indonesia* or KBLI) in Indonesian terms.

ISIC-2-digit level of aggregation allows for separating food industry (10) and beverage industry (11) from other manufacturing industries, so analysis can be focused on sub-sectoral level. Unfortunately, ISIC-2-digit level of aggregation does not allow for separation of vegetable oil production from the rest of the food and beverage industry, which requires a 5-digit level of ISIC code. Analyzing the food industry at a 2-digit level will not be sufficient since palm oil derivatives, which dominate the food industry, will mask the importance of intermediate input's role in the industry as a whole.

Most publications on the Indonesian manufacturing industry are sourced from Survey Industri, which can be bought from BPS directly. However, we are unable to acquire the firm-level data

from the BPS with the detail we need. That is, while typical researchers using Survey Industri have firm level information which has ISIC-5-digit level of disaggregation, we were permitted to only purchase up to 2-digit level of ISIC, which does not allow for taking out palm oil industries. This adds to the complication of Survey Industry which has been reported with various deterioration of quality (Marquez-Ramos, 2020).

While the information in the BPS website is mostly aggregated to industry level data with 2-digit ISIC aggregation, it differentiates the aggregation by 3 types of firm sizes: micro-sized firms, small firms, and medium and large firms (medium and large are aggregated into one category). That is, we have information on output, labor cost, and value added from the food industry aggregated from medium and large sized firms and from micro and small firms. Data available on the website is 2010–2020 for micro and small industry.

The classification by firm size by itself does not provide information for us on how to separate vegetable oil manufacturing from the food industry. However, palm oil manufacturing is a capital intensive and a low margin industry which requires a large network of palm oil suppliers owned by various sizes of palm oil plantations. It requires a large scale production, which is naturally dominated by large sized firms (Ministry of Trade, n.d., Tempo, 2022). On the other hand, small firms in F&B are less likely to be dominated with palm oil production. While this is not as ideal as having the information of non-palm oil firms, focusing the analysis on micro and small sized firms will reduce the bias created by palm oil derivatives.

On top of that, understanding how imported intermediate inputs affect micro and small sized firms is extremely important. Research suggests that trade policy affects smaller firms more since they lack the capacity to navigate sudden changes in the economic landscape caused by trade policies (Gupta, 2021). Moreover, it has been shown that intermediate inputs allow for firm upgrading (Pane and Patunru, 2021) which is crucial if Indonesia would like to improve the welfare of its micro and small sized enterprises.

Method

In this paper, we employ the Autoregressive Distributed Lag (ARDL) method (Pesaran and Smith, 1995; Pesaran, Shin and Smith, 2001). ARDL is a method that shows how two or more time series variables correlate with each other. ARDL can be used on variables that are not stationary, which is the case for trade and industry nominal data. We then can check if variables used are having a long run cointegration or not. This is also the method employed by Amanta and Gupta (2022). The ARDL specification that we use is as follows:

$$y_t = \beta_0 + \beta_1 y_{t-1} + \beta_2 \text{intm}_t + \beta_3 \text{intm}_{t-1} + \mu_t$$

where y_t is the various variables measuring industry's performance. That is, we use five different variables for y_t , namely output, value added, average value added per firm, average value added per worker, and wage. intm is the sum of Indonesia's imported intermediate inputs as used by Amanta and Gupta (2022). All variables are log-transformed to reduce heterogeneity. The use of lag 1 operator (i.e., the $t-1$) drops one observation (that is, the year 2010).

Using imports as an independent variable could lead to omitted variable bias since the decision to import is subject to manager's observation of the state of the firm, which is not always observable by researchers (Levinsohn and Petrin, 2003). However, unlike large firms, micro and small sized enterprises typically do not import directly. The decision to import is not directly made by the firm's manager, which reduces the bias. Additionally, we use ARDL to capture the autocorrelation which may be caused by variables outside of this research's interest. This ARDL specification allows for capturing the correlation between imported inputs and the industry's performance, and shows whether or not the correlations are not spurious (that is, they are cointegrated in the long run).

Results

The results from the ARDL are shown on these tables below. The (-1) beside the dependent variable and *intm* means that those are the one year lag variables. We can see from the tables that all one year lag of *intm* are significant at less than 10% level. Intermediate inputs play a huge role in the performance of micro and small sized food and beverage industries and we see the impact one year after the change in imports.

Table 6.1
Log Output, Small Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|----------------|----------|
| (Intercept) | 5.66 | -18.48 – 29.81 | 0.573 |
| output (-1) | 0.34 | -0.29 – 0.98 | 0.227 |
| intm | -2.84 | -8.99 – 3.32 | 0.289 |
| intm (-1) | 2.73 | -0.48 – 5.93 | 0.08 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.699 / 0.518 | | |

Table 6.2
Log Employment, Small Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|---------------|----------|
| (Intercept) | 19.76 | -0.87 – 40.39 | 0.057 |
| L(lnaker, 1) | 0.16 | -0.63 – 0.96 | 0.619 |
| lintm | -2.25 | -7.47 – 2.97 | 0.318 |
| L(lintm, 1) | -1.30 | -3.85 – 1.25 | 0.248 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.506 / 0.210 | | |

Table 6.3
Log No of Firms, Small Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|---------------|----------|
| (Intercept) | 18.30 | -3.13 – 39.73 | 0.080 |
| L(ln, 1) | 0.08 | -0.76 – 0.93 | 0.808 |
| lintm | -2.03 | -7.46 – 3.40 | 0.380 |
| L(lintm, 1) | -1.25 | -3.89 – 1.38 | 0.275 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.454 / 0.126 | | |

Table 6.4
Log Value Added, Small Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|----------------|----------|
| (Intercept) | 3.81 | -22.80 – 30.41 | 0.728 |
| L(lva, 1) | 0.21 | -0.56 – 0.98 | 0.518 |
| lintm | -2.77 | -9.88 – 4.33 | 0.362 |
| L(lintm, 1) | 3.25 | -0.02 – 6.51 | 0.051 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.595 / 0.352 | | |

Table 6.5
Log Value Added per Firms, Small Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|----------------|----------|
| (Intercept) | -15.82 | -31.55 – -0.09 | 0.049 |
| L(lvan, 1) | 0.03 | -0.36 – 0.42 | 0.865 |
| lintm | -0.2 | -4.34 – 3.95 | 0.907 |
| L(lintm, 1) | 4.52 | 2.64 – 6.39 | 0.002 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.901 / 0.842 | | |

Table 6.6
Log Value Added per Worker, Small Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|----------------|----------|
| (Intercept) | -17.64 | -32.75 – -2.54 | 0.03 |
| L(lvana, 1) | 0.04 | -0.33 – 0.41 | 0.793 |
| lintm | 0.04 | -3.93 – 4.01 | 0.98 |
| L(lintm, 1) | 4.5 | 2.70 – 6.30 | 0.001 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.909 / 0.855 | | |

Table 6.7
Log Wage, Small Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|---------------|----------|
| (Intercept) | -19.69 | -41.19 – 1.82 | 0.065 |
| L(lw, 1) | -0.05 | -0.56 – 0.47 | 0.828 |
| lintm | 0.53 | -4.75 – 5.82 | 0.806 |
| L(lintm, 1) | 4.4 | 2.06 – 6.73 | 0.005 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.855 / 0.768 | | |

Table 6.8
Log Output, Micro Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|----------------|----------|
| (Intercept) | -12.95 | -37.48 – 11.57 | 0.233 |
| L(loutput, 1) | 0.26 | -0.25 – 0.78 | 0.248 |
| lintm | -0.04 | -6.39 – 6.30 | 0.986 |
| L(lintm, 1) | 4.53 | 1.66 – 7.41 | 0.01 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.853 / 0.765 | | |

Table 6.9
Log Employment, Micro Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|--------------|----------|
| (Intercept) | 2.97 | -2.04 – 7.99 | 0.188 |
| L(lnaker, 1) | 0.90 | 0.43 – 1.37 | 0.004 |
| lintm | -0.90 | -2.39 – 0.58 | 0.178 |
| L(lintm, 1) | 0.36 | -0.29 – 1.00 | 0.215 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.911 / 0.857 | | |

Table 6.10
Log No of Firms, Micro Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|--------------|----------|
| (Intercept) | 2.25 | -4.31 – 8.80 | 0.418 |
| L(ln, 1) | 0.89 | 0.38 – 1.39 | 0.006 |
| lintm | -0.69 | -2.54 – 1.16 | 0.382 |
| L(lintm, 1) | 0.33 | -0.49 – 1.15 | 0.351 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.894 / 0.831 | | |

Table 6.11
Log Value Added, Micro Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|----------------|----------|
| (Intercept) | -14.52 | -40.17 – 11.14 | 0.205 |
| L(lva, 1) | 0.26 | -0.28 – 0.79 | 0.271 |
| lintm | -0.12 | -7.04 – 6.79 | 0.965 |
| L(lintm, 1) | 4.92 | 1.92 – 7.91 | 0.008 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.836 / 0.738 | | |

Table 6.12
Log Value Added per Firms, Micro Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|---------------|----------|
| (Intercept) | -16.07 | -35.84 – 3.69 | 0.091 |
| L(lvan, 1) | 0.02 | -0.49 – 0.54 | 0.914 |
| lintm | 0.14 | -5.08 – 5.36 | 0.947 |
| L(lintm, 1) | 4.01 | 1.64 – 6.38 | 0.007 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.824 / 0.718 | | |

Table 6.13
Log Value Added per Worker, Micro Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|---------------|----------|
| (Intercept) | -17.39 | -37.76 – 2.98 | 0.08 |
| L(lvana, 1) | 0.08 | -0.44 – 0.59 | 0.722 |
| lintm | 0.29 | -5.06 – 5.65 | 0.893 |
| L(lintm, 1) | 4.09 | 1.68 – 6.50 | 0.007 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.828 / 0.724 | | |

Table 6.14
Log Wage, Micro Enterprises

| <i>Predictors</i> | <i>Estimates</i> | <i>CI</i> | <i>p</i> |
|--|------------------|---------------|----------|
| (Intercept) | -23.22 | -55.52 – 9.07 | 0.124 |
| L(lw, 1) | -0.22 | -0.86 – 0.42 | 0.418 |
| lintm | 0.53 | -7.46 – 8.52 | 0.871 |
| L(lintm, 1) | 5.07 | 1.55 – 8.59 | 0.014 |
| Observations | 9 | | |
| R ² / R ² adjusted | 0.758 / 0.613 | | |

Table 6.15
Bound F-test results

| Variable | Small Enterprises | | Micro Enterprises | |
|----------------------------|-------------------|------|-------------------|------|
| | stat | pval | stat | pval |
| log output | 3.51 | 0.1 | 5.71 | 0.01 |
| log employment | 3.70 | 0.08 | 2.92 | 0.18 |
| log no of firms | 3.49 | 0.10 | 1.77 | 0.51 |
| log value added | 2.95 | 0.18 | 5.42 | 0.01 |
| log value added per firm | 16.14 | 0 | 9.23 | 0 |
| log value added per person | 17.51 | 0 | 8.44 | 0 |
| log average wage | 10.72 | 0 | 8.92 | 0 |

The bound F-test (Pesaran, Shin and Smith, 2001) is used to test long run cointegration between variables used in the ARDL. The null hypothesis for this test is that there is no cointegration, while the alternative hypothesis is that there is possible cointegration. All variables are tested between the variables in table 6.15 and *intm*. Only log value added for small enterprises shows no cointegration with import of intermediate inputs. However, its value added per firm and value added per person are all cointegrated with *intm* in the long run. This results suggests that the relationship between those variables and *intm* is not spurious.

The R codes for checks and replications can be found here
<https://github.com/imedkrisna/food>

Limitation

This study is limited by the data available for processing. As previously noted, BPS does not provide an aggregation that allows for separating the palm oil industries. Moreover, we are not aware if their micro and small firms datasets are available for purchase. Without this granular information, we rely on the available data which is aggregated to sectoral level (that is, ISIC-2-digit aggregation).

This paper is also limited by the number of observations. The widely available data is presented in the website only from 2010–2020. Since the data is annual, we can only have 10 observations. While in our case the first lag is enough, AR-based methods, including ARDL, typically require longer span datasets. The short timespan limits us from exploring higher-degree lags. This is the main reason why our specification rests on the first lag and is limited by the number of confounders we can use.

Various studies have shown the importance of intermediate imported inputs as well as backward GVC participation in general. This paper complements these findings. However, further research in the F&B industry, both in general and in particular for micro and small firms, using more detailed datasets is required to provide a more robust conclusion and policy advice and evaluation.

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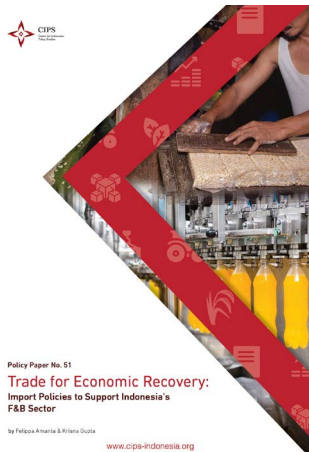
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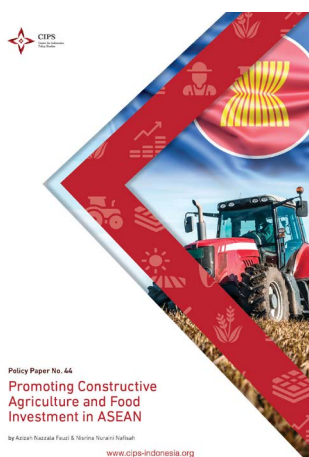
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