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Exports and Employment in China, Indonesia, Japan and Korea

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Abstract

EXPORTS AND EMPLOYMENT IN CHINA, INDONESIA, JAPAN AND KOREA

This paper examines the effects of exports on employment in China, Indonesia, Japan and Korea. It draws on input-output data for the period from 1995 to 2009 to estimate the effects on each industry's employment (i.e. direct effects) and on other industries' employment through intra-industry linkages (i.e. indirect effects). There are four major findings. First, at the aggregate level, the implied employment from exports increased in China, Japan and Korea. Second, at the industry level, exports and the shares of implied employment from exports increased in machinery-related industries such as Machinery (NEC), Electrical and Optical Equipment, and Transport Equipment in China, Indonesia and Korea. Third, although more than 80% of exports in the four study countries are from manufacturing industries, the employment effects are not limited to manufacturing industries. A significant number of workers in non-manufacturing industries depend upon manufacturing exports through vertical inter-industry linkages. Non-manufacturing industries account for between 40% and 60% of the implied employment from exports. Finally, in 2009, the share of implied employment from Chinese final demand exceeded that from the US final demand in both Japan and Korea. An implication of the overall results is that even in cases where an industry is not particularly directly export-oriented, the industry may still be subject to potential effects – positive or negative – of changes in export demand.

Key words: Trade, exports, employment, intra-industry linkages

JEL Classification: F16 (Trade and labour market interactions)

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The OECD-led **International Collaborative Initiative on Trade and Employment** (ICITE) brought together ten international organisations in an effort to deepen our understanding of the linkages between trade and jobs and to develop policy-relevant conclusions. ICITE mobilised resources world-wide in an extensive programme of research, dialogue and communications. Participating organisations included: ADB, AfDB, ECLAC, IADB, ILO, OAS, OECD, UNCTAD, World Bank and WTO. The ICITE project was implemented under the auspices of a team at OECD. Douglas Lippoldt was the project manager. Jacqueline Maher provided secretarial and administrative support. Clarisse Legendre provided statistical assistance. The team is based in the Development Division, headed by Trudy Witbreuk, and under the direction of Raed Safadi, OECD Deputy Director for Trade and Agriculture, and Ken Ash, OECD Director for Trade and Agriculture.

The OECD published a series of Trade Policy Papers drawing on ICITE research. The ICITE papers benefitted from comments and other support from ICITE partner organisations, the Working Party of the OECD Trade Committee and other national experts, participants at ICITE regional conferences held during 2011-14 in Africa, Asia and Latin America, and other parts of the OECD including the Directorate for Employment, Labour and Social Affairs. This paper was developed as an input to the ICITE project. The views expressed are those of the author and do not necessarily reflect those of the OECD, OECD member country governments or partners of the ICITE initiative.

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Executive summary

In light of the importance of the relationship between exports and employment, this paper examines the effects of exports on employment in China, Indonesia, Japan and Korea. The paper draws on the World Input-Output Database (WIOD) for the period from 1995 to 2009, which enables us to estimate the effects of exports on each industry's employment (i.e. direct effects) and on other industries' employment through intra-industry linkages (i.e. indirect effects). It clarifies how employment in these four countries relates to exports and how the relationships changed over the period. The paper, prepared as part of the OECD's International Collaborative Initiative on Trade and Employment (ICITE), builds on the earlier ICITE country study of Japan's exports and employment (Kiyota, 2011).¹

There are four major findings. First, at the aggregate level, the implied employment from exports - employment created through both direct and indirect effects from exports - increased in China, Japan and Korea. Second, at the industry level, exports and the shares of implied employment from exports increased in machinery-related industries such as *Machinery (NEC)*, *Electrical and Optical Equipment*, and *Transport Equipment* in China, Indonesia and Korea. Although this result does not necessarily mean that direct competition between developed and developing countries is increasing over the period, it provides an indication that it may be worthwhile for firms in developed countries to explore whether to differentiate their products by upgrading quality or moving up the value chain. Third, although more than 80% of exports in the four study countries are from manufacturing industries, the effects of exports on employment are not limited to manufacturing industries. A significant number of workers in non-manufacturing industries depend upon manufacturing exports through vertical inter-industry linkages. Non-manufacturing industries account for between 40 and 60% of the implied employment from exports. Finally, in 2009, the share of implied employment from Chinese final demand exceeded that from the US final demand in both Japan and Korea. The results indicate that the effects of the final demand of China are outpacing those of Japan and the United States.

An implication of the overall results is that even in cases where an industry is not particularly directly export-oriented, the industry may still be subject to potential effects – positive or negative – of changes in export demand. An industry's export dependence will be large if downstream customers are highly export dependent. Producers need to be aware not only of the export dependence of their industry but also of the export dependence of their upstream producers and downstream customers in different industries. Even non-exporters can be significantly affected by external changes in demand through such intra-industry linkages. In identifying the potential risks of negative external shocks, it is important for policy makers to identify how much employment is created indirectly as well as directly by exports.

¹ This paper was prepared as part of the OECD ICITE project launched in 2010. It uses WIOD data in light of their annual availability and compatibility with the similar framework employed in the original ICITE country study of Japan's exports and employment (2011) available here: http://www.oecd-ilibrary.org/trade/trade-and-employment-in-japan_5kg3nh62jg0x-en. In 2013, the OECD and WTO subsequently released the Trade in Value Added (TiVA) database, which will provide a high-quality data source for this type of analysis going forward: <http://www.oecd.org/sti/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm>.

I. Introduction²

With the growth of exports in the world economy, the effect of exports on employment is one of the major concerns for business leaders and policy makers in many countries. This tendency is particularly true in East and Southeast Asian countries after the financial turbulence in 2008, whose effect was initially expected to be rather small but turned out to be quite large. Indeed, IMF (2009) pointed out that “The impact on the real economy through the trade channel has been severe and similar across Asia. The drop in global demand has been particularly focused on automobiles, electronics, and other consumer durable goods that are an integral part of the production structure across East Asia. As a result, exports and industrial production have plummeted” (IMF, 2009, p. 71).

In light of the importance of the relationship between exports and employment, this paper examines the effects of exports on employment in China, Indonesia, Japan and Korea. We focus on China, Japan and Korea for two reasons. First, participation in global value chains has increased notably in these three countries.³ Second, these countries are sometimes compared with each other due to their regional proximities and their similarities and differences in economic performances.⁴ For the purpose of comparative analysis, the paper also focuses on one of the emerging economies in this region: Indonesia. This enables us to compare countries in different income levels in the East and Southeast Asia.⁵

Our motivation comes from two strands of research. One is the literature on the effects of exports on employment, which utilises a national input-output (IO) table. For example, Feenstra and Hong (2010) asked how much employment is created by Chinese exports. Using Chinese IO tables from 1997 to 2005, they found that exports became increasingly important in stimulating employment in China. However, the same gains could be obtained from the growth in domestic demand. Similarly, Kiyota (2012) asked the same question in Japan, using Japanese IO data between 1975 and 2006. The study found that Japanese employment increased in export dependence over the period. Note that the demand for labour can be affected not only by an industry's own exports (i.e. direct effects) but also by the exports of other industries through intra-industry linkages (i.e. indirect effects). Kiyota (2012) found that the magnitude of the indirect effects exceeded those of the direct effects over almost the entire period. OECD (2013) analysis found relatively high employment-export dependencies in China, Japan and Korea (1995-2008) and high dependencies (though declining over the period) in Indonesia.

² This paper was prepared by Kozo Kiyota under a consultancy for the OECD. I wish to thank Bernard Kennedy and Douglas Lippoldt for the helpful comments. The views expressed are those of the author and do not necessarily represent those of the OECD, its Member countries or ICITE partner organisations.

³ “Comparing 2009 with 1995, GVC (global value chain) participation has increased in almost all G20 countries, and particularly in China, India, Japan and Korea” (OECD, WTO and UNCTAD, 2013, p. 8). For more on this issue, see the OECD-WTO TiVA data referenced in footnote 1 above and the OECD Inter-Country Input-Output (ICIO) Database, available here: <http://www.oecd.org/trade/input-outputtables.htm>.

⁴ For example, using industry-level data, Motohashi (2007) compared the productivity of industries across China, Japan, Korea, Chinese Taipei and the United States. Similarly, Fukao, Inui, Kabe and Liu (2008) compared the productivity of listed firms in Japan, Korea and China.

⁵ According to the World Bank (2013), in 2011, per-capita GDP is USD 6 091 for China, USD 46 720 for Japan, USD 22 590 for Korea, and USD 3 557 for Indonesia (current USD). While covering other countries may also be of interest, we choose Indonesia because of the regional importance of its economy and the availability of the requisite data.

A second strand in the literature examines vertical linkages and international trade using global IO tables.⁶ For example, a recent study by Timmer, Los, Stehrer and Vries (2013) estimated value added trade to measure the competitiveness of economies using the World Input-Output Database (WIOD) for the period from 1995 to 2009.⁷ They found that gross exports overestimate the competitiveness of the economies that rely heavily on imported intermediates. Moreover, this bias has increased over time. Similarly, Foster-McGregor and Stehrer (2013) utilized the WIOD for the period from 1995 to 2011, extending the focus on value-added imports. They considered the value added share from third countries embodied in imports of a country from direct trading partners in relation to total imports, which they call the share of multilateral foreign value added content of imports. They found that the share of multilateral foreign value added content of imports was smaller than that of exports. Besides, it tended to be more similar across countries, implying that the value added content from the bilateral (rather than multilateral) relations is still more important.

Both strands of research have made significant contributions to the literature. However, there is potential for further exploration of the effects of exports through international vertical linkages on employment (e.g. as shown by the recent assessment, OECD, 2013).⁸ The first line of the study in the literature lacks the perspectives of international comparison while the second line, until recently, paid less attention to the effects on employment. This paper thus attempts to integrate and extend these two strands of study, focusing on China, Indonesia, Japan and Korea. That is, we examine the effects of exports on employment, taking into account of inter-industry and inter-country vertical linkages.

In doing so, this paper utilises the global IO tables in the WIOD.⁹ The use of the WIOD has the following advantage. As we will discuss in detail in Section 2, the global IO table reports domestic and imported intermediate inputs separately, and reports the exports for the intermediate and for the final uses separately. Note that the increases in the intermediate inputs are ultimately attributable to the increases in the final demand. In other words, because the demand for intermediate inputs is not independently determined from the demand for final goods, it should be determined “endogenously” in some sense.

⁶ An alternative approach is to impute a global IO table from national IO tables, employing a proportionality assumption: the proportion of intermediate to final goods is the same for domestic supply and imported products. Such an approach is employed by Trefler and Zhu (2010) and Johnson and Noguera (2012). Puzzello (2012) found that countries' use of domestic factors is overstated with the introduction of this assumption although biases generated on exported and imported factor contents cancel each other out. A recent study by Koopman, Wang and Wei (2014) proposed an alternative approach not relying on the proportionality assumption. The use of the WIOD is another way to relax the proportionality assumption.

⁷ More recently, OECD-WTO's Trade in Value Added database provides a cutting edge tool for the exploration of these issues. It is available here: <http://www.oecd.org/sti/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm>.

⁸ In an earlier study, the World Trade Organization-Japan External Trade Organization (WTO-JETRO) (2011, Chapter 6) examined the relationship between exports and employment using global IO tables. That study considered effects of exports on employment in East and Southeast Asian countries as well as the United States, using the Asian International IO table in 2000 and 2005 developed by the Institute of Development Economics (IDE)-JETRO. Although their motivation is the same as ours, the analysis is less formal in the sense that the study did not provide detailed explanations about the methodology and the analysis is based on preliminary data. Moreover, as we will discuss in detail in Section 2, the data used in our analysis have some advantages.

⁹ The OECD-WTO Trade in Value Added database can also be utilised for this type of analysis.

Previous studies such as Feenstra and Hong (2010) and Kiyota (2012) could not distinguish the difference between exports for the intermediate use and those for the final use. As Kimura (2006, p. 330) pointed out, “Active back-and-forth transactions of machinery parts and components are observed among countries with different income levels.” Besides, such transactions are expanding from East Asia to North America. For example, parts and components are first exported from Japan to China for processing, and then exported to Mexico for assembling, and then exported to the United States for the final use. The global IO table enables us to focus on the exports for the final use.¹⁰

Before starting, some terminological matters need to be clarified. First, following Feenstra and Hong (2010), we call employment created through both direct and indirect effects “implied employment”. Second, this paper focuses on exports for final use. In other words, the effects of exports mean the effects of exports for final use because the exports of intermediate inputs are “endogenously” determined as we will explain in Section 2. We also explain the data used in this paper in Section 2. Section 3 examines the effects of exports on employment. Section 4 investigates the effects of the final demand of China, Japan and the United States. A summary and concluding remarks are contained in Section 5.

2. Methodology and Data

2.1. Methodology

A logical starting point to estimate the implied employment from exports is to use the IO tables to examine both direct and indirect demand for labour.¹¹ This section provides the mathematical exposition of the methodology which follows a standard approach of a global IO analysis such as Timmer, Los, Stehrer and Vries (2013).

Suppose that there are M production factors and S industries in N countries. Although we will apply annual data in our empirical analysis below, time subscripts are left out for ease of exposition. Output in each country-industry is produced using domestic production factors and intermediate inputs, which are sourced domestically or from abroad. Output is used to satisfy final demand (either at home or abroad) or used as an intermediate input in production (either at home or abroad as well).

To trace the transactions of intermediate and final goods, it is necessary to define source and destination country-industries.¹² For a particular good, let i be the source country, j be the destination country, s be the source industry, and t be the destination industry. Let $y_i(s)$ be the value of output in industry s of country i , $f_{ij}(s)$ be the value of output exported from industry s in country i for the final use in any country j , $x_{ij}(s, t)$ be the value of output exported from industry s in country i to the intermediate use by industry t in country j . If $j = i$ ($j \neq i$), goods are used at home (abroad). The goods market clearing condition is written as:

$$y_i(s) = \sum_j \sum_t x_{ij}(s, t) + \sum_j f_{ij}(s). \quad (1)$$

¹⁰ For example, using detailed trade data for the period from 1991 to 2011, Ando and Kimura (2012) found that “transactions of Mexico with East Asia become much more active with a greater variety of product-country pairs and that the extent and depth of fragmentation of production in the US-Mexico nexus enhanced with a connection of East Asia particularly in the electric machinery sector” (p. 25).

¹¹ Note that the standard IO model is based on a number of restrictive assumptions such as constant returns to scale, and fixed input and labour coefficients. For more detailed discussion of some of the criticisms, see Baldwin (1994). OECD (1992) summarizes the advantages and limitations of the IO analysis in a comprehensive way.

¹² In this study, goods, products and industries are regarded as interchangeable.

For illustrative purposes, Figure 1 presents the structure of the global IO for a three-countries case (i.e. $N = 3$) where $v_j(t)$ indicates the value added of industry t in country j . As Figure 1 shows, the global IO reports domestic and imported intermediate inputs separately (from top to bottom), and reports the exports for the intermediate use and for the final use (from left to right). For example, Country 1's outputs go to the intermediate use for domestic industries ($x_{11}(s, t)$) and the intermediate use by Country 2 ($x_{12}(s, t)$) and by Country 3 ($x_{13}(s, t)$). Country 1's outputs also go to the final use in domestic market ($f_{11}(s)$) and the final use by Country 2 ($f_{12}(s)$) and by Country 3 ($f_{13}(s)$). Similarly, the imports (for final use) of Country 1 are captured by $f_{21}(s)$ and $f_{31}(s)$.

Let \mathbf{y} be the vector of production of dimension $(SN \times 1)$, which is obtained by stacking output levels $y_i(s)$ in each country-industry. Define \mathbf{f} as the vector of dimension $(SN \times 1)$ that is constructed by stacking world final demand for output from each country-industry $f_i(s) \equiv \sum_j f_{ij}(s)$. Let \mathbf{A} be a global intermediate input coefficients matrix of dimension $(SN \times SN)$ whose element $a_{ij}(s, t) \equiv x_{ij}(s, t)/y_j(t)$. This element indicates the output from industry s in country i used as the intermediate input by industry t in country j as the share of output in the latter industry. Therefore, the matrix \mathbf{A} describes how the goods of each country-industry are produced using a combination of domestic and foreign intermediate inputs.

Figure 1. Three-Country Global Input-Output Table

		Country 1	Country 2	Country 3	Country 1	Country 2	Country 3	Total
		Intermediate	Intermediate	Intermediate	Final demand	Final demand	Final demand	
		Industry	Industry	Industry				
Country 1	Industry	$x_{11}(s, t)$	$x_{12}(s, t)$	$x_{13}(s, t)$	$f_{11}(s)$	$f_{12}(s)$	$f_{13}(s)$	$y_1(s)$
Country 2	Industry	$x_{21}(s, t)$	$x_{22}(s, t)$	$x_{23}(s, t)$	$f_{21}(s)$	$f_{22}(s)$	$f_{23}(s)$	$y_2(s)$
Country 3	Industry	$x_{31}(s, t)$	$x_{32}(s, t)$	$x_{33}(s, t)$	$f_{31}(s)$	$f_{32}(s)$	$f_{33}(s)$	$y_3(s)$
Value added		$v_1(t)$	$v_2(t)$	$v_3(t)$				
		$y_1(t)$	$y_2(t)$	$y_3(t)$				

Note: $y_i(s)$ is the value of output in industry s of country i ; $f_{ij}(s)$ is the value of output exported from industry s in country i for final use in any country j ; $x_{ij}(s, t)$ is the value of output exported from industry s in country i for intermediate use by industry t in country j ; $v_j(t)$ indicates the value added of industry t in country j . For more detail about the notations, see the main text.

Equation (1) is rewritten as $\mathbf{y} = \mathbf{A}\mathbf{y} + \mathbf{f}$. Rearranging this, the following fundamental IO identity is obtained:

$$\mathbf{y} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{f}, \quad (2)$$

where \mathbf{I} is an identity matrix of dimension $(SN \times SN)$ and $(\mathbf{I} - \mathbf{A})^{-1}$ is so-called Leontief inverse (Leontief, 1936) whose element in row s and column t of this matrix means the total production value of industry s needed for production of one unit of final output in industry t .¹³

There are two remarks in this equation. First, in the IO analysis, final demand sectors \mathbf{f} are called exogenous sectors while intermediate input sectors are called endogenous sectors. All the changes in the endogenous sectors of an IO table are the results of changes in the exogenous sectors. Note that, in a global IO table, the exports of intermediate inputs are captured in the endogenous sectors. In this sense, therefore, the exports of intermediate inputs are determined endogenously in the global IO analysis. Second, in this connection, noting that $(\mathbf{I} - \mathbf{A})^{-1}$ is the

¹³ Value added trade can be, for example, captured by $\mathbf{v}(\mathbf{I} - \mathbf{A})^{-1}\mathbf{t}$, where \mathbf{v} is the vector of value added share and \mathbf{t} is the vector of net trade. For more detail, see Foster-McGregor and Stehrer (2013).

Leontief inverse of the intermediate inputs transactions between industries across countries, Equation (2) captures all the direct and indirect effects through the domestic vertical linkages between industries within a country (i.e. $j = i$) and the international vertical linkages between countries (i.e. $j \neq i$).

Let $L_i(s)$ be the number of workers working for industry s in country i and $l_i(s)$ be its labour-input coefficient: $l_i(s) \equiv L_i(s)/y_i(s)$. Denote \mathbf{l} as a vector of dimension $(SN \times 1)$ whose element is $L_i(s)$ and $\hat{\mathbf{L}}$ as a diagonal matrix of dimension $(SN \times SN)$ whose element is $l_i(s)$. From Equation (2), the effects of final demand on employment can be rewritten as:

$$\mathbf{l} = \hat{\mathbf{L}}\mathbf{y} = \hat{\mathbf{L}}(\mathbf{I} - \mathbf{A})^{-1}\mathbf{f}. \quad (3)$$

Equation (3) is used to estimate the effects of employment.

2.2. Data

This paper utilises WIOD data for the period from 1995 to 2009 (Timmer, 2012).¹⁴ The WIOD is built on national accounts data which were developed within the 7th Framework Programme of the European Commission.¹⁵ The WIOD provides time-series of global IO tables for 27 EU countries, 13 other major countries, and the rest-of-the-world (ROW). The 13 countries include non-EU OECD member countries such as Japan and the United States and emerging economies such as China, Indonesia and Mexico.¹⁶ These tables are constructed on the basis of officially published IO tables in conjunction with national accounts and international trade statistics.

The simplified structure of the world IO table is presented in Figure 2, which is the same structure as that of Figure 1. As Figure 2 shows, the WIOD reports domestic and imported intermediate inputs separately, and reports exports for intermediate use and final use. For

¹⁴ Going forward, the OECD-WTO Trade in Value Added (TiVA) database will provide a high-quality data source for this type of analysis: <http://www.oecd.org/sti/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm>. The next release is scheduled for November 2014 and will cover 61 economies and 34 industries.

¹⁵ The WIOD and all satellite accounts are available at <http://www.wiod.org>. The satellite accounts include National IO Tables, Socio Economic Accounts (i.e. data on employment, capital stocks, etc.), and Environmental Accounts. In this paper, we utilize World IO Tables released in April 2012 and Social Economic Accounts data released in February 2012. For a detailed description of the database construction, see Timmer (2012).

¹⁶ The list of countries in the WIOD is as follows. European Union: Austria, Belgium, Bulgaria, Cyprus^{1,2}, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, the Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden and the United Kingdom; North America: Canada and the United States; Latin America: Brazil and Mexico; Asia and Pacific: China, India, Japan, South Korea, Australia, Chinese Taipei, Turkey, Indonesia and Russia. The regional classification follows Timmer (2012, Table 1).

1. Note by Turkey: The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the “Cyprus issue”.
2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

example, Country 1's exports consist of exports for intermediate use by Country 2 and by the ROW and exports for final use by Country 2 and by the ROW. It thus enables us to focus on exports for final use. The database consists of 35 industries, of which 34 industries are listed in Tables 4-7 below plus the *Private Households with Employed Persons* industry. The values are available at current prices and at previous year prices.

Figure 2. Structure of World Input-Output Table: Two Countries and the Rest of the World

		Country 1	Country 2	ROW	Country 1	Country 2	ROW	Total
		Intermediate	Intermediate	Intermediate	Final demand	Final demand	Final demand	
		Industry	Industry	Industry				
Country 1	Industry	Intermediate use of domestic output	Intermediate use by Country 2 of exports from Country 1	Intermediate use by ROW of exports from Country 1	Final use of domestic output	Final use by Country 2 of exports from Country 1	Final use by ROW of exports from Country 1	Output in Country 1
Country 2	Industry	Intermediate use by Country 1 of exports from Country 2	Intermediate use of domestic output	Intermediate use by ROW of exports from Country 2	Final use by Country 1 of exports from Country 2	Final use of domestic output	Final use by ROW of exports from Country 2	Output in Country 2
Rest of the World (ROW)	Industry	Intermediate use by Country 1 of exports from ROW	Intermediate use by Country 2 of exports from ROW	Intermediate use of domestic output	Final use by Country 1 of exports from ROW	Final use by Country 2 of exports from ROW	Final use of domestic output	Output in ROW
Value added		Value added	Value added	Value added				
		Output in Country 1	Output in Country 2	Output in ROW				

Source: Timmer (2012, Figure 2).

An advantage of the use of the WIOD is that it provides Socio Economic Accounts which include annual data such as employment at the industry level.¹⁷ This enables us to examine the effects of exports on employment more precisely. Moreover, throughout the data collection effort, harmonisation procedures were applied to ensure international comparability of the data. This ensures data quality and enables us to conduct comparative analysis at the industry and national levels. A disadvantage is that, among 35 industries, the *Private Households with Employed Persons* industry does not necessarily report figures. If the entry is missing, we replace it with a zero. If input coefficients are not defined because of zero gross output, we also replace them with a zero.¹⁸

2.3. Descriptive statistics

Exports

Table 1 presents the evolution of gross exports in China, Indonesia, Japan and Korea from 1995 to 2009. There are four major findings with respect to export growth. First, China shows the remarkable export growth. Chinese exports were USD 734.6 billion in 2008, which was

¹⁷ A global IO table is also developed by the IDE-JETRO. Although the IDE-JETRO international IO table covers other Southeast Asian countries such as Thailand and is available from 1985, it is only available at five year intervals (year 2005 is the latest year). Its industry classification is less detailed (24-26 industries) than that of the WIOD and is not harmonised throughout the period. Consequently, this paper utilises WIOD. For more detail about the IDE-JETRO international IO table, see Meng, Zhang and Inomata (2013). As noted above, going forward the OECD-WTO Trade in Value Added (TiVA) database will provide a high-quality data source for this type of analysis

¹⁸ A problem with WIOD data is that there may be exports to the ROW that take negative values (e.g. *Mining and Quarrying* in Korea in 2009). This is because the exports to the ROW are defined as the residual of the total exports minus exports summed over the set of WIOD countries in the national supply and use tables. As for the negative values, we use them as they are stated. An advantage of the OECD-WTO TiVA database is that it excludes these outcomes unless they reflect changes introduced in the 2008 SNA and BPM6 related to merchanting transactions, where negative exports may still occur.

eight times as much as her exports in 1995 (USD 91.7 billion). Although Chinese exports declined from 2008 to 2009, the overall growth was the fastest among four countries. In 1995, Chinese exports were about half of Japanese exports (USD 186.8 billion). In 2009, however, Chinese exports became more than three times as much as Japanese exports (USD 206.2 billion).

Table 1. Evolution of Exports in China, Japan, Korea, and Indonesia

Exports (millions of US dollars, nominal)															
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China	91 728	93 658	106 182	105 891	110 449	134 771	145 960	178 078	237 358	300 910	394 765	494 696	636 030	734 610	652 164
Indonesia	15 862	18 226	19 350	15 236	15 846	20 110	19 891	19 337	19 416	19 022	21 464	24 070	26 808	31 142	27 880
Japan	186 751	173 552	177 117	180 406	191 323	206 920	174 573	183 360	204 949	225 722	236 193	251 723	267 514	290 389	206 152
Korea	54 011	56 808	59 334	57 869	65 242	79 645	72 378	78 395	93 008	106 895	109 689	121 008	133 836	151 569	132 255
Growth (1995 = 100)															
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China	100.0	102.1	115.8	115.4	120.4	146.9	159.1	194.1	258.8	328.0	430.4	539.3	693.4	800.9	711.0
Indonesia	100.0	114.9	122.0	96.1	99.9	126.8	125.4	121.9	122.4	119.9	135.3	151.7	169.0	196.3	175.8
Japan	100.0	92.9	94.8	96.6	102.4	110.8	93.5	98.2	109.7	120.9	126.5	134.8	143.2	155.5	110.4
Korea	100.0	105.2	109.9	107.1	120.8	147.5	134.0	145.1	172.2	197.9	203.1	224.0	247.8	280.6	244.9
Share (total final demand = 100%)															
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China	12.1	10.6	10.9	10.2	9.9	10.9	10.7	11.8	13.8	14.6	16.5	17.4	17.4	15.7	12.6
Indonesia	6.5	6.5	6.9	14.7	10.2	12.0	12.1	9.7	8.4	7.8	8.0	6.9	6.5	6.2	5.3
Japan	3.6	3.8	4.2	4.7	4.4	4.5	4.3	4.8	4.9	5.0	5.3	5.9	6.3	6.0	4.2
Korea	10.4	10.1	11.2	16.9	14.6	15.2	14.6	13.8	14.7	15.4	13.4	13.1	13.2	15.8	16.1

Note: Detailed sectoral figures are presented in Tables A1-A4.

Source: WIOD, November 2013 Release.

Second, although Japanese exports grew by 50% from 1995 to 2008, the growth of Japanese exports was the slowest among the four countries. In addition, Japanese exports decreased by 34.3% between 2008 and 2009, which was the largest plunge among these countries. Third, Korean exports also grew rapidly over the period. Korean exports were USD 151.6 billion in 2008, which was 2.8 times as much as her exports in 1995. Although Korean exports fell by 13.6% from 2008 to 2009, Korean exports in 2009 were still 2.4 times as much as her exports in 1995.

Fourth, the growth of Indonesian exports was relatively modest in the sense that the growth rate was in between those of Japan and Korea. Indonesian exports in 2009 were USD 31.1 billion, which was about twice as much as her exports in 1995. Indonesian exports fell by 11.1% between 2008 and 2009, which was the smallest decline among these four countries.

The bottom panel of Table 1 reports the share of exports in total final demand. Three findings stand out from this part. First, the Chinese and Korean economies both show relatively high dependence on exports. In 2009, the export shares of China and Korea were 12.6% and 16.1%, respectively. In this connection, it is notable that Korean export dependence grew from 10.4% to 16.1% between 1995 and 2009. This table points to an increase in the potential vulnerability of Korean economy to negative demand shocks in other countries.

Second, in contrast, the Japanese economy shows relatively low dependence on exports. In 2009, the share of exports to total final demand was 4.2% in Japan, which was the smallest among these four countries. Nevertheless, considering the size of the Japanese economy, its growth was notable: from 3.6% in 1995 to 6.3% in 2007, before declining to 6.0% in 2008 and 4.2% in 2009. These figures imply an overall increase in the importance of exports in the Japanese economy. Finally, the Indonesian economy also shows relatively low export dependence. In 2009, the export share was 5.3%. Note that Indonesian exports increased by

75.8% from 1995 to 2009. The low export dependence thus suggests relatively high growth of the domestic final demand.

The fluctuations of export shares are relatively high in Indonesia and Korea. In Indonesia, the export share increased from 6.5% in 1995 to 14.7% in 1998, and then dropped to 10.2% in 1999. Similarly, in Korea, the export share increased from 10.4% in 1995 to 16.9% in 1998, and then declined to 14.6% in 1999. One possible reason for this is the Asian financial crisis during 1997-98. Despite the falls in Indonesian and Korean exports from 1997 to 1998, the shares of exports in domestic final demand increased in both countries. This means that domestic final demand shrunk more rapidly than exports during 1997-98, which coincides with the period of the Asian financial crisis. In other words, this result suggests that in this respect the Asian financial crisis hit Indonesia and Korea more severely than China and Japan.

Employment

Table 2 shows the evolution of employment, measured by the number of persons engaged in work. The major findings are twofold. First, employment growth was relatively modest in China, Indonesia and Korea. The growth of employment from 1995 to 2009 was 14.6% in China, 15.2% in Korea, and 24.0% in Indonesia. In these three countries, employment grew gradually throughout the period. Second, in contrast, the employment growth in Japan was negative for 1995-2009. Employment was almost constant between 1995 (53.8 million workers) and 2008 (53.5 million workers). From 2008 to 2009, however, employment fell by 8.1%. As a result, employment dropped to 49.3 million workers in 2009.

Table 2. Evolution of Employment in China, Japan, Korea, and Indonesia

Number of persons engaged (thousands)															
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China	680 650	689 500	698 200	706 370	713 940	720 850	730 250	737 400	744 320	752 000	758 250	764 000	769 900	774 800	779 950
Indonesia	87 271	88 910	90 204	90 827	92 114	93 321	93 437	93 655	94 323	94 695	95 464	97 880	103 349	105 753	108 203
Japan	53 767	54 252	54 767	54 304	53 699	53 778	53 800	53 220	53 165	53 333	53 676	54 501	54 736	53 523	49 344
Korea	20 398	20 837	21 201	19 918	20 277	21 136	21 557	22 152	22 117	22 534	22 830	23 133	23 418	23 561	23 490
Growth (1995 = 100)															
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China	100.0	101.3	102.6	103.8	104.9	105.9	107.3	108.3	109.4	110.5	111.4	112.2	113.1	113.8	114.6
Indonesia	100.0	101.9	103.4	104.1	105.5	106.9	107.1	107.3	108.1	108.5	109.4	112.2	118.4	121.2	124.0
Japan	100.0	100.9	101.9	101.0	99.9	100.0	100.1	99.0	98.9	99.2	99.8	101.4	101.8	99.5	91.8
Korea	100.0	102.2	103.9	97.6	99.4	103.6	105.7	108.6	108.4	110.5	111.9	113.4	114.8	115.5	115.2

Note: Detailed sectoral figures are presented in Tables A5-A8.

Source: WIOD, November 2013 Release.

3. Effects of Exports on Employment

3.1. All industry

Table 3 presents the evolution of implied employment from exports in China, Indonesia, Japan and Korea, which is calculated using Equation (3).¹⁹ There are two notable findings in this table. First, for China and Korea, the implied employment from exports shows relatively large growth. From 1995 to 2009, the implied employment from exports grew by 28.5% in China and

¹⁹ These results differ from the estimates in OECD (2013), referenced above, which excluded data for the agricultural sector. Inclusion of agriculture in the assessment could result in some upward bias in implied employment estimates in cases where large numbers of workers in the sector are engaged in non-market activity or where there are significant productivity differentials among agricultural employers depending on their participation in global value chains. Hence, the Appendix attached below presents a robustness check of the employment results excluding agriculture.

34.7% in Korea. Accordingly, the share of implied employment from exports in total final demand increased from 9.1% to 10.2% in China, and 7.8% to 9.2% in Korea over the period. This result suggests the increasing relative importance of exports to domestic final demand in the Chinese and Korean economies.

Table 3. Evolution of Implied Employment from Exports in China, Indonesia, Japan and Korea

Number of persons engaged (thousands)															
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China	62 091	54 932	56 951	55 620	53 633	56 930	57 503	64 076	73 160	80 096	89 706	95 704	99 345	90 152	79 808
Indonesia	3 612	3 615	3 763	6 862	5 455	6 482	6 493	5 435	4 929	4 721	5 110	4 469	4 503	4 286	4 094
Japan	1 806	1 899	2 107	2 345	2 202	2 174	2 161	2 309	2 341	2 298	2 343	2 580	2 678	2 593	1 743
Korea	1 600	1 579	1 728	2 312	2 014	2 135	2 133	2 048	2 137	2 162	1 878	1 821	1 818	2 069	2 156
Growth (1995 = 100)															
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China	100.0	88.5	91.7	89.6	86.4	91.7	92.6	103.2	117.8	129.0	144.5	154.1	160.0	145.2	128.5
Indonesia	100.0	100.1	104.2	190.0	151.0	179.5	179.8	150.5	136.5	130.7	141.5	123.7	124.7	118.7	113.3
Japan	100.0	105.2	116.7	129.8	121.9	120.4	119.7	127.8	129.7	127.2	129.8	142.9	148.3	143.6	96.5
Korea	100.0	98.7	108.0	144.5	125.9	133.4	133.3	128.0	133.6	135.1	117.3	113.8	113.6	129.3	134.7
Share (implied employment from exports to total final demand = 100%)															
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China	9.1	8.0	8.2	7.9	7.5	7.9	7.9	8.7	9.8	10.7	11.8	12.5	12.9	11.6	10.2
Indonesia	4.1	4.1	4.2	7.6	5.9	6.9	6.9	5.8	5.2	5.0	5.4	4.6	4.4	4.1	3.8
Japan	3.4	3.5	3.8	4.3	4.1	4.0	4.0	4.3	4.4	4.3	4.4	4.7	4.9	4.8	3.5
Korea	7.8	7.6	8.2	11.6	9.9	10.1	9.9	9.2	9.7	9.6	8.2	7.9	7.8	8.8	9.2

Note: Detailed sectoral figures are presented in Tables A9-A12. Total final demand is the total final demand of all countries.

Source: WIOD, November 2013 Release.

Second, in Japan and Indonesia, the implied employment from exports shows relatively high volatility. In Japan, the implied employment from exports grew from 3.4% to 4.9% between 1995 and 2007. However, it decreased to 3.5% in 2009. This result suggests that the Great Recession in 2008-09 hit the Japanese economy severely. In Indonesia, the implied employment from exports grew from 4.4% to 6.3% between 1995 and 1998 but decreased gradually to 4.1% in 2009. Noting that exports grew by 75.8% from 1995 to 2009 (Table 1) and the number of person engaged grew by 24.0% (Table 2), this result suggests that both the growth of domestic final demand and that of the labour force contributed to increased employment, which results in the fall in the share of implied employment from exports in Indonesia.

3.2. By industry

China

Table 4 presents the evolution of exports and implied employment from exports, by industry, in China. Notable findings are summarised as follows. First, the export growth of *Electrical and Optical Equipment* is remarkable. The share of exports grew from 21.1% to 39.3% between 1995 and 2009. Second, the export growth of *Machinery, Nec* and *Transport Equipment* is also notable. The shares of exports increased from 3.7% in 1995 to 9.2% in 2009 for *Machinery, Nec* and from 1.4% to 4.0% for *Transport Equipment*. Third, the share of *Agriculture, Hunting, Forestry and Fishing* is very small throughout the period.²⁰ It fell from 3.0% in 1995 to 1.0% in

²⁰

As noted above, concerns may arise that the agricultural sector in some developing countries appears to be somewhat heterogeneous in its employment composition, with a mix of market (relatively high productivity) and non-market (relatively low productivity) labour utilisation. Some indications of this can be found in the literature (e.g. Bowlus, and Sicular, 2003, p. 570; Wang, 2008, pp. 115-16). The Appendix (below) addresses this concern to check the robustness of our broad results for China.

2009. This implies that the agricultural products are consumed mainly in Chinese domestic market.

Table 4. Evolution of Exports and Implied Employment from Exports in China, by Industry

	Exports (All industry = 100%)					Implied employment (All industry = 100%)				
	1995	2000	2005	2008	2009	1995	2000	2005	2008	2009
All industry	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1 Agriculture, Hunting, Forestry and Fishing	3.0	1.2	0.9	0.7	1.0	45.9	37.0	40.3	36.5	36.4
2 Mining and Quarrying	0.3	0.1	0.1	0.2	0.1	2.0	1.3	1.3	1.4	1.4
3 Food, Beverages and Tobacco	8.9	6.7	4.6	4.0	4.3	1.8	1.9	1.8	1.7	1.8
4 Textiles and Textile Products	29.2	23.4	18.8	17.4	17.6	9.6	9.1	9.5	9.8	10.2
5 Leather, Leather and Footwear	7.7	6.8	5.0	4.3	4.4	1.5	2.6	3.1	3.1	3.2
6 Wood and Products of Wood and Cork	1.7	0.8	0.4	0.3	0.3	0.9	1.0	1.2	1.6	1.5
7 Pulp, Paper, Printing and Publishing	1.0	0.6	0.3	0.2	0.2	0.9	1.1	1.4	1.8	1.8
8 Coke, Refined Petroleum and Nuclear Fuel	0.3	0.5	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1
9 Chemicals and Chemical Products	1.7	2.2	2.4	2.3	2.5	1.7	1.4	1.4	1.5	1.5
10 Rubber and Plastics	3.2	3.2	2.5	2.2	2.2	1.4	2.4	2.7	2.9	3.0
11 Other Non-Metallic Mineral	2.0	2.0	0.8	0.6	0.6	1.5	1.1	0.7	0.6	0.5
12 Basic Metals and Fabricated Metal	4.5	2.9	2.2	2.2	2.1	2.1	1.7	1.5	1.7	1.7
13 Machinery, Nec	3.7	5.3	7.8	9.7	9.2	1.7	1.4	1.8	2.7	2.4
14 Electrical and Optical Equipment	21.1	27.7	39.3	39.7	39.3	3.0	3.6	4.5	5.7	5.7
15 Transport Equipment	1.4	1.9	2.6	3.9	4.0	0.5	0.5	0.5	0.8	0.8
16 Manufacturing, Nec; Recycling	4.4	6.3	4.5	5.4	5.7	5.5	7.9	5.6	4.6	4.7
17 Electricity, Gas and Water Supply	0.1	0.1	0.1	0.1	0.0	0.5	0.5	0.6	0.6	0.6
18 Construction	0.4	0.2	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	0.0	1.7	1.3	1.0	1.0	1.6	1.9	1.6	1.6	1.6
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	0.0	1.7	1.3	1.1	1.0	4.3	8.4	5.7	6.8	6.5
22 Hotels and Restaurants	1.7	0.7	0.6	0.6	0.8	1.4	1.1	1.4	1.7	1.9
23 Inland Transport	0.4	0.3	0.4	0.3	0.3	1.9	2.0	2.2	2.3	2.2
24 Water Transport	0.3	0.5	0.8	0.8	0.7	0.4	0.3	0.3	0.3	0.3
25 Air Transport	0.8	0.8	1.0	1.0	0.9	0.1	0.2	0.2	0.3	0.3
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	0.5	0.2	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.1
27 Post and Telecommunications	0.1	0.2	0.2	0.2	0.2	0.6	0.5	0.5	0.6	0.5
28 Financial Intermediation	0.1	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.6	0.6
29 Real Estate Activities	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1
30 Renting of M&Eq and Other Business Activities	0.1	0.4	0.5	0.5	0.5	0.3	0.3	0.4	0.4	0.5
31 Public Admin and Defence; Compulsory Social Security	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32 Education	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2
33 Health and Social Work	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2
34 Other Community, Social and Personal Services	1.1	1.6	0.8	0.4	0.4	7.2	9.2	8.3	7.5	7.5
Manufacturing (3-16)	90.9	90.0	91.6	92.6	92.6	32.4	36.0	36.1	38.5	39.0
Non-manufacturing (1-2, 17-34)	9.1	10.0	8.4	7.4	7.4	67.6	64.0	63.9	61.5	61.0

Note: Detailed annual figures are presented in Tables A1 and A9. Throughout this paper, *Not elsewhere classified* is abbreviated as “Nec” and *Renting of machinery and equipment* is abbreviated as “Renting of M&Eq”.

Source: WIOD, November 2013 Release.

Fourth, in contrast, the share of implied employment from exports in *Agriculture, Hunting, Forestry and Fishing* points remains relatively high, despite a decline from 45.9% in 1995 to 36.4% in 2009. This corresponds to the large share of *Agriculture, Hunting, Forestry and Fishing* in overall employment. In 2009, for example, the employment share of *Agriculture, Hunting, Forestry and Fishing* was 38.1% (Annex Table A5). In view of the high labour intensity of production in this industry including with respect to exports, even small changes in exports thus affect relatively large numbers of workers.²¹ In this connection, the export dependence of employment on non-manufacturing industries is also high in China. In 2009, about one-third of implied employment from exports is in non-manufacturing industries. This implies that manufacturing exports have significant effects on non-manufacturing as well as manufacturing employment through vertical inter-industry linkages.

Finally, on the one hand, the shares of implied employment from exports in *Machinery, Nec* and *Electrical and Optical Equipment* increased gradually. The combined shares of the implied employment from exports for these two industries increased from 4.7% to 8.2% during the period from 1995 to 2009. As exports increase, employment that depends upon exports also

²¹

The same argument can be applied to high volatility in the share of some of the services industries such as Chinese retail trade and Indonesian wholesale trade even though the aggregate non-manufacturing figures show relatively steady trends. The effects of the Asian financial crisis for 1997-98 and those of the Great Recession for 2008-09 may also contribute to the high volatility.

increased in these two industries. On the other hand, the implied employment from exports in *Textiles and Textile Products* and *Transport Equipment* is relatively stable. Between 1995 and 2009, the share changed from 9.6% to 10.2% in *Textiles and Textile Products* and from 0.5% to 0.8% in *Transport Equipment*. In these industries, changes in exports did not have significant effects on employment.

Indonesia

Table 5 presents the evolution of exports and shares of implied employment from exports, by industry, in Indonesia. There are three notable findings. First, the major exporting industries in Indonesia are *Food, Beverages and Tobacco*; *Textiles and Textile Products*; and *Leather, leather and Footwear*. These three industries accounted for 34.9% of exports in 2009, declining from 45.0% in 1995. It is also notable that the share of the implied employment from exports in *Textiles and Textile Products* increased from 9.2% to 16.0% during the period from 1995 to 2009.

Table 5. Evolution of Exports and Implied Employment from Exports in Indonesia, by Industry

	Exports (All industry = 100%)					Implied employment (All industry = 100%)				
	1995	2000	2005	2008	2009	1995	2000	2005	2008	2009
All industry	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1 Agriculture, Hunting, Forestry and Fishing	0.8	0.8	1.0	0.8	0.7	40.6	35.2	31.0	26.2	24.8
2 Mining and Quarrying	0.0	0.0	0.1	0.1	0.0	0.3	0.9	0.5	0.6	0.6
3 Food, Beverages and Tobacco	13.4	11.0	9.3	9.5	8.8	6.2	3.7	2.0	1.8	1.6
4 Textiles and Textile Products	21.4	23.1	23.4	20.4	20.6	9.2	10.7	15.9	16.4	16.0
5 Leather, Leather and Footwear	10.2	5.8	5.7	5.4	5.5	7.4	5.0	4.8	5.1	6.2
6 Wood and Products of Wood and Cork	0.5	0.6	0.4	0.4	0.4	2.6	4.3	4.2	3.4	2.8
7 Pulp, Paper, Paper, Printing and Publishing	0.1	0.5	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3
8 Coke, Refined Petroleum and Nuclear Fuel	8.6	8.8	5.3	5.6	3.3	0.1	0.2	0.2	0.2	0.1
9 Chemicals and Chemical Products	1.1	1.1	1.3	1.6	1.5	0.5	0.5	0.4	0.4	0.4
10 Rubber and Plastics	3.0	1.4	2.5	1.9	1.8	2.3	1.4	1.9	1.7	1.6
11 Other Non-Metallic Mineral	0.8	1.1	0.7	0.6	0.6	1.0	0.9	0.7	0.6	0.6
12 Basic Metals and Fabricated Metal	0.6	0.8	0.9	0.6	0.7	0.3	0.4	0.4	0.3	0.3
13 Machinery, Nec	3.0	6.4	5.7	10.3	11.3	0.4	1.1	0.5	0.7	1.0
14 Electrical and Optical Equipment	12.5	20.3	17.0	13.1	15.9	0.6	1.0	1.7	1.4	1.2
15 Transport Equipment	2.1	0.8	2.7	5.1	3.7	0.3	0.2	0.4	0.7	0.6
16 Manufacturing, Nec: Recycling	10.4	10.9	11.8	9.3	9.4	5.5	8.0	8.3	5.7	5.0
17 Electricity, Gas and Water Supply	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.2	0.2
18 Construction	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.3	0.3	0.3
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	0.0	0.0	0.3	0.4	1.3	7.8	9.7	7.4	6.8	8.4
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	0.0	0.0	1.4	1.6	1.5	4.7	5.8	6.4	6.3	6.4
22 Hotels and Restaurants	5.2	2.6	2.2	2.4	3.1	1.0	1.4	2.0	5.8	6.8
23 Inland Transport	0.4	0.2	1.4	1.5	1.5	2.9	3.4	4.0	4.2	4.2
24 Water Transport	0.8	0.1	0.4	0.5	0.8	0.8	0.5	0.4	0.6	0.9
25 Air Transport	1.4	0.9	0.8	0.8	0.7	0.1	0.1	0.3	0.4	0.3
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	0.5	0.2	0.5	0.5	0.5	0.5	0.8	0.5	0.7	0.7
27 Post and Telecommunications	0.3	0.1	0.2	0.3	0.3	0.1	0.3	0.7	0.7	0.6
28 Financial Intermediation	1.7	0.5	0.1	0.5	0.2	0.6	0.6	0.3	0.5	0.4
29 Real Estate Activities	0.2	0.1	1.6	1.7	1.6	0.0	0.1	0.7	0.7	0.6
30 Renting of M&Eq and Other Business Activities	0.0	0.0	0.1	0.1	0.0	0.2	0.7	0.0	0.0	0.0
31 Public Admin and Defence; Compulsory Social Security	0.4	0.2	0.7	0.9	0.8	0.4	0.4	0.8	0.8	0.6
32 Education	0.1	0.1	0.5	0.5	0.5	0.7	0.3	1.3	1.4	1.2
33 Health and Social Work	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.3	0.2
34 Other Community, Social and Personal Services	0.7	1.4	1.9	3.5	2.8	2.1	1.5	1.5	5.2	4.7
Manufacturing (3-16)	87.7	92.7	86.9	84.1	83.6	36.5	37.7	41.5	38.6	37.9
Non-manufacturing (1-2, 17-34)	12.3	7.3	13.1	15.9	16.4	63.5	62.3	58.5	61.4	62.1

Note: Detailed annual figures are presented in Tables A2 and A10.

Source: WIOD, November 2013 Release.

Second, like China, the employment share of the implied employment from exports in *Agriculture, Hunting, Forestry and Fishing* was also large, although it fell from 40.4% to 25.2% between 1995 and 2009. Like China, the share of *Agriculture, Hunting, Forestry and Fishing* in implied employment from exports is still large.²² A small change in exports may thus affect relatively large numbers of workers.

²² As in the case of China, concerns may arise that the agricultural sector in Indonesia may be somewhat heterogeneous in its employment composition, with a mix of market (relatively high productivity) and

Finally, the export share of *Machinery, Nec* showed rapid increase from 3.0% in 1995 to 11.3% in 2009. In contrast, the implied employment from exports in *Machinery, Nec* increased slightly from 0.4% to 1.0% over the period. This result implies that the employment of *Machinery, Nec* is weakly associated exports during these years, possibly due to a rapid increase in productivity in this industry.

Japan

Table 6 presents the evolution of exports and shares of implied employment from exports, by industry, in Japan. Major findings are summarised as follows. First, Japan's major exporting industries include: *Machinery, Nec*; *Electrical and Optical Equipment*; and *Transport Equipment*. The combined export share of these three industries amounted to 73.4% in 2009. Between 1995 and 2009, the export shares of *Machinery, Nec* and *Electrical and Optical Equipment* decreased, while the share of *Transport Equipment* increased.

Table 6. Evolution of Exports and Implied Employment from Exports in Japan, by Industry

	Exports (All industry = 100%)					Implied employment (All industry = 100%)				
	1995	2000	2005	2008	2009	1995	2000	2005	2008	2009
All industry	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1 Agriculture, Hunting, Forestry and Fishing	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.5
2 Mining and Quarrying	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2
3 Food, Beverages and Tobacco	0.9	0.6	0.9	0.9	1.3	0.9	0.8	1.0	1.1	1.3
4 Textiles and Textile Products	0.4	0.3	0.3	0.3	0.4	1.2	1.0	1.1	1.1	1.3
5 Leather, Leather and Footwear	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
6 Wood and Products of Wood and Cork	0.1	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4
7 Pulp, Paper, Paper, Printing and Publishing	0.1	0.1	0.1	0.2	0.2	2.0	1.8	1.6	1.6	1.9
8 Coke, Refined Petroleum and Nuclear Fuel	0.3	0.3	0.4	1.0	0.7	0.0	0.0	0.0	0.0	0.0
9 Chemicals and Chemical Products	2.3	2.4	3.0	2.6	3.4	1.4	1.5	1.4	1.2	1.6
10 Rubber and Plastics	0.6	0.8	1.0	1.0	1.2	3.3	3.5	3.3	3.2	3.2
11 Other Non-Metallic Mineral	0.3	0.2	0.1	0.1	0.1	0.9	0.9	0.8	0.8	0.6
12 Basic Metals and Fabricated Metal	2.7	1.6	1.8	2.3	2.6	7.3	6.6	6.6	6.4	6.2
13 Machinery, Nec	24.3	22.7	19.3	18.8	16.3	12.9	12.6	9.9	9.7	7.8
14 Electrical and Optical Equipment	29.7	28.6	21.6	19.1	22.0	19.5	17.6	14.4	12.3	13.2
15 Transport Equipment	26.3	28.9	36.1	39.5	35.1	12.3	13.2	16.2	16.7	15.3
16 Manufacturing, Nec; Recycling	1.8	2.0	1.9	1.7	1.9	1.2	1.2	1.2	1.0	1.1
17 Electricity, Gas and Water Supply	0.0	0.0	0.1	0.1	0.1	0.7	0.7	0.7	0.7	0.9
18 Construction	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	1.0	1.1
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.7	0.8	0.7
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	2.0	3.6	4.7	3.8	5.1	7.4	8.4	8.4	8.2	8.8
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	0.2	0.3	0.4	0.4	0.5	2.1	2.4	2.9	3.1	3.0
22 Hotels and Restaurants	0.9	1.3	1.9	1.7	1.8	4.1	4.8	5.7	5.9	5.7
23 Inland Transport	0.8	1.0	1.1	1.1	1.4	3.7	4.0	4.2	4.8	5.0
24 Water Transport	2.4	2.2	2.3	2.7	3.0	1.5	1.3	0.9	0.8	1.0
25 Air Transport	0.6	1.4	1.2	0.9	0.9	0.2	0.3	0.2	0.1	0.1
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	0.3	0.2	0.3	0.3	0.3	1.0	1.0	1.0	1.1	1.1
27 Post and Telecommunications	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.7
28 Financial Intermediation	0.5	0.4	0.4	0.5	0.5	2.9	2.7	2.4	2.3	2.3
29 Real Estate Activities	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.2	0.2	0.2
30 Renting of M&Eq and Other Business Activities	0.2	0.5	0.3	0.4	0.4	6.0	7.2	9.2	10.6	10.4
31 Public Admin and Defence; Compulsory Social Security	0.1	0.2	0.1	0.1	0.1	0.3	0.4	0.4	0.4	0.4
32 Education	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
33 Health and Social Work	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.4
34 Other Community, Social and Personal Services	2.1	0.2	0.3	0.2	0.2	4.0	2.5	2.7	2.9	3.3
Manufacturing (3-16)	89.8	88.6	86.6	87.5	85.3	63.4	61.2	57.9	55.6	53.9
Non-manufacturing (1-2, 17-34)	10.2	11.4	13.4	12.5	14.7	36.6	38.8	42.1	44.4	46.1

Note: Detailed annual figures are presented in Tables A3 and A11.

Source: WIOD, November 2013 Release.

Second, in this connection, the overall share of implied employment from exports in these three major industries remained relatively large despite a decrease from 44.6% in 1995 to 36.3% in 2009. In *Transport Equipment*, the share increased from 12.3% to 15.3% over the period while the shares of *Machinery, Nec* and *Electrical and Optical Equipment* declined. This result implies that there was structural change underway for these major exporting industries in Japan.

Finally, exports are also playing an important role for Japan's non-manufacturing industries. The share of implied employment from exports is relatively high in *Renting of Machinery and*

non-market (relatively low productivity) labour utilisation. Thus, the Appendix (below) addresses this concern to check the robustness of our broad results for Indonesia.

Equipment and Other Business Activities (10.4%), *Wholesale Trade* (8.8%), and *Hotels and Restaurant* (5.7%) in 2009. As a result, the share of implied employment from exports in non-manufacturing increased from 36.6% to 46.1% for 1995-2009. Noting that manufacturing exports accounted for 85.3% of the total in 2009, the result implies that a number of workers in non-manufacturing industries depend upon manufacturing exports through vertical inter-industry linkages.

Korea

Table 7 presents the evolution of exports and shares of implied employment from exports, by industry, in Korea. The major findings are threefold. First, the export share of *Textiles and Textile Products* fell significantly. Between 1995 and 2009, it dropped from 14.2% to 2.7%. Accordingly, the share of implied employment from exports in *Textiles and Textile Products* also decreased significantly from 13.6% to 2.6% over the period. This result suggests the decline in the relative importance of exports by *Textiles and Textile Products* in Korea.

Table 7. Evolution of Exports and Implied Employment from Exports in Korea, by Industry

	Exports (All industry = 100%)					Implied employment (All industry = 100%)				
	1995	2000	2005	2008	2009	1995	2000	2005	2008	2009
All industry	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1 Agriculture, Hunting, Forestry and Fishing	1.0	0.4	0.2	0.2	0.2	9.0	7.9	6.3	5.9	7.1
2 Mining and Quarrying	0.0	-0.3	0.0	-0.1	0.0	0.1	0.0	0.1	0.0	0.1
3 Food, Beverages and Tobacco	4.0	3.1	2.8	2.8	3.2	1.4	1.2	1.2	1.2	1.3
4 Textiles and Textile Products	14.2	9.8	5.2	2.9	2.7	13.6	9.5	5.1	3.0	2.6
5 Leather, Leather and Footwear	3.2	1.4	0.4	0.3	0.2	2.5	1.3	0.4	0.3	0.3
6 Wood and Products of Wood and Cork	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.2	0.2	0.2
7 Pulp, Paper, Paper, Printing and Publishing	0.2	0.3	0.3	0.3	0.2	1.1	1.1	1.1	1.0	1.0
8 Coke, Refined Petroleum and Nuclear Fuel	1.0	2.5	2.4	3.6	2.9	0.2	0.3	0.4	0.3	0.3
9 Chemicals and Chemical Products	1.9	1.1	1.3	1.5	1.5	1.9	1.4	1.1	1.0	1.0
10 Rubber and Plastics	0.6	0.5	0.8	0.6	0.6	2.0	2.0	3.1	2.9	3.0
11 Other Non-Metallic Mineral	0.1	0.1	0.0	0.0	0.0	0.8	0.7	0.6	0.5	0.6
12 Basic Metals and Fabricated Metal	1.5	0.9	0.8	0.7	0.9	3.3	3.3	3.9	4.0	4.2
13 Machinery, Nec	10.6	9.6	11.5	14.4	12.7	6.9	6.3	6.9	8.1	7.8
14 Electrical and Optical Equipment	22.6	30.6	29.0	23.0	24.0	11.5	10.1	12.1	10.0	10.0
15 Transport Equipment	23.5	24.8	33.2	37.2	39.5	9.1	10.3	11.8	12.7	12.9
16 Manufacturing, Nec; Recycling	3.8	2.6	1.6	0.9	1.0	2.2	1.9	1.6	1.2	1.3
17 Electricity, Gas and Water Supply	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.4	0.4
18 Construction	0.1	0.1	0.0	0.0	0.0	0.5	0.4	0.2	0.3	0.3
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0.0	0.0	0.0	0.0	0.0	0.5	0.2	0.3	0.3	0.3
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	1.4	1.1	1.2	1.4	1.2	8.8	8.6	8.9	8.4	8.5
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	1.2	2.5	1.4	1.5	1.3	4.2	7.7	6.5	7.1	6.6
22 Hotels and Restaurants	1.1	1.9	1.1	1.3	1.1	3.4	7.3	6.6	7.3	6.7
23 Inland Transport	0.6	0.7	0.1	0.1	0.1	1.7	1.6	2.1	2.2	2.2
24 Water Transport	3.3	2.3	3.0	3.7	3.5	2.7	2.4	3.1	3.5	3.6
25 Air Transport	1.4	1.4	1.3	1.1	0.9	1.3	1.5	1.4	1.2	1.1
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	0.2	0.2	0.1	0.1	0.1	1.0	0.8	1.2	1.3	1.3
27 Post and Telecommunications	0.2	0.1	0.1	0.1	0.1	0.4	0.5	0.6	0.7	0.7
28 Financial Intermediation	0.2	0.3	0.4	0.4	0.3	3.4	2.6	2.0	2.3	2.2
29 Real Estate Activities	0.0	0.0	0.1	0.1	0.1	0.4	0.5	0.5	0.6	0.6
30 Renting of M&Eq and Other Business Activities	0.5	0.4	0.5	0.6	0.5	3.4	5.2	7.8	9.1	9.0
31 Public Admin and Defence; Compulsory Social Security	1.2	1.1	0.6	0.7	0.7	0.7	0.9	0.5	0.6	0.5
32 Education	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.2
33 Health and Social Work	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
34 Other Community, Social and Personal Services	0.5	0.5	0.3	0.3	0.3	1.4	1.7	1.9	2.2	2.1
Manufacturing (3-16)	87.1	87.2	89.3	88.3	89.5	56.6	49.7	49.5	46.5	46.5
Non-manufacturing (1-2, 17-34)	12.9	12.8	10.7	11.7	10.5	43.4	50.3	50.5	53.5	53.5

Note: Detailed annual figures are presented in Tables A4 and A12.

Source: WIOD, November 2013 Release.

Second, like Japan, major Korean export industries include *Machinery, Nec; Electrical and Optical Equipment*; and *Transport Equipment*. The share of these three industries amounted to 76.2% of exports in 2009. Between 1995 and 2009, the export shares of *Machinery, Nec; Electrical and Optical Equipment* increased slightly while that of *Transport Equipment* increased significantly from 23.5% to 39.5%. In a related manner, the share of implied employment from exports in these three industries increased from 27.4% to 30.8% between 1995 and 2009.

Finally, the exports also affected non-manufacturing industries in Korea. For example, the share of *Renting of M&Eq and Other Business Activities* increased from 3.4% in 1995 to 9.0%

in 2009. Similarly, the share of implied employment from exports in non-manufacturing increased from 43.4% to 53.5% between 1995 and 2009. Noting that the export share of manufacturing accounted for 89.5% in 2009, the result implies that the linkages through exports are expanding from manufacturing industries to non-manufacturing industries.

3.3. Discussion

At the aggregate level, the implied employment from exports increased in all four countries considered here. As a result, the dependence of employment on exports relative to domestic final demand gradually increased throughout the period for China, Japan and Korea. In Indonesia, however, the share of implied employment from exports was relatively flat. One possible reason for this is the rapid increase in domestic final demand and labour force. At the industry level, the shares of implied employment from exports increased in machinery-related industries such as *Machinery, Nec, Electrical and Optical Equipment*, and *Transport Equipment* in China, Indonesia and Korea, as the exports from these industries expanded. (In contrast, the overall share of implied employment from exports in these three industries decreased in Japan.) The result implies the increasing similarity of exports as well as labour contents across these countries.

This result is consistent with the findings of Schott (2008) and Kiyota (2010). Using US product-level import data, Schott (2008) found that China's export bundle similarity with the OECD (excluding the United States) was greater than one would expect given China's size and income level. Similarly, using Japanese product-level import data, Kiyota (2010) found that more than 85% and 83% of products exported from the US and the EU, respectively, to Japan are also commonly exported from China.

Note, however, that this result does not necessarily mean that direct competition between China and developed countries is increasing over the period. Both Schott (2008) and Kiyota (2010) found that the developed countries' exports were priced higher than China's export products with the implication that there is some differentiation in varieties. Nonetheless, Kiyota (2010) found that the price differences of developed countries' exports relative to China's exports were relatively small in some industries. The result implies that, for firms in developed countries, quality upgrading or moving up the value chains can be an important means of differentiating products.²³

Note also that, in Korea, the export share of *Textiles and Textile Products* declined significantly from 1995 to 2009. As a result, the implied employment from exports in *Textiles and Textile Products* also fell significantly over the period. In contrast, in Indonesia, the export share of *Textiles and Textile Products* decreased significantly from 1995 to 2009 but the share of the implied employment from exports in *Textiles and Textile Products* actually rose somewhat indicating increased export-related labour concentration in the sector. In Indonesia, therefore, a further negative shock on exports in *Textiles and Textile Products* may affect a relatively large number of workers.

Although more than 80% of exports are from manufacturing industries in all four of the countries, the effects of exports on employment are not limited to manufacturing industries. Non-manufacturing industries accounted for roughly 40 to 60% of the implied employment from exports. A significant number of workers in non-manufacturing industries depend upon manufacturing exports through vertical inter-industry linkages. This result implies that even where an industry is not particularly export-oriented in a direct manner, it may still be vulnerable to positive or negative demand changes with respect to exports. An industry's actual

²³ OECD (2008, p. 10) also argued the importance and policy implications of moving up the value chain.

export dependence will be large if downstream customers are highly export dependent. Producers need to be aware not only of the export dependence of their industry but also of the export dependence of their upstream producers and downstream customers in different industries. Even non-exporters can be significantly affected by external shocks through inter-industry linkages.

4. Effects of Final Demand: China versus the United States

While Section 3 focused on the overall exports, one may be concerned with the effects of foreign final demand. Are the effects of Chinese final demand on employment in Indonesia, Japan and Korea increasing? Are the effects of US final demand still larger than those of Chinese final demand? These questions are nontrivial because exports to China may simply be caused by the US final demand rather than the Chinese final demand. In identifying the potential risks from exports, it is worth examining the effects of foreign final demand. This section attempts to address this issue.

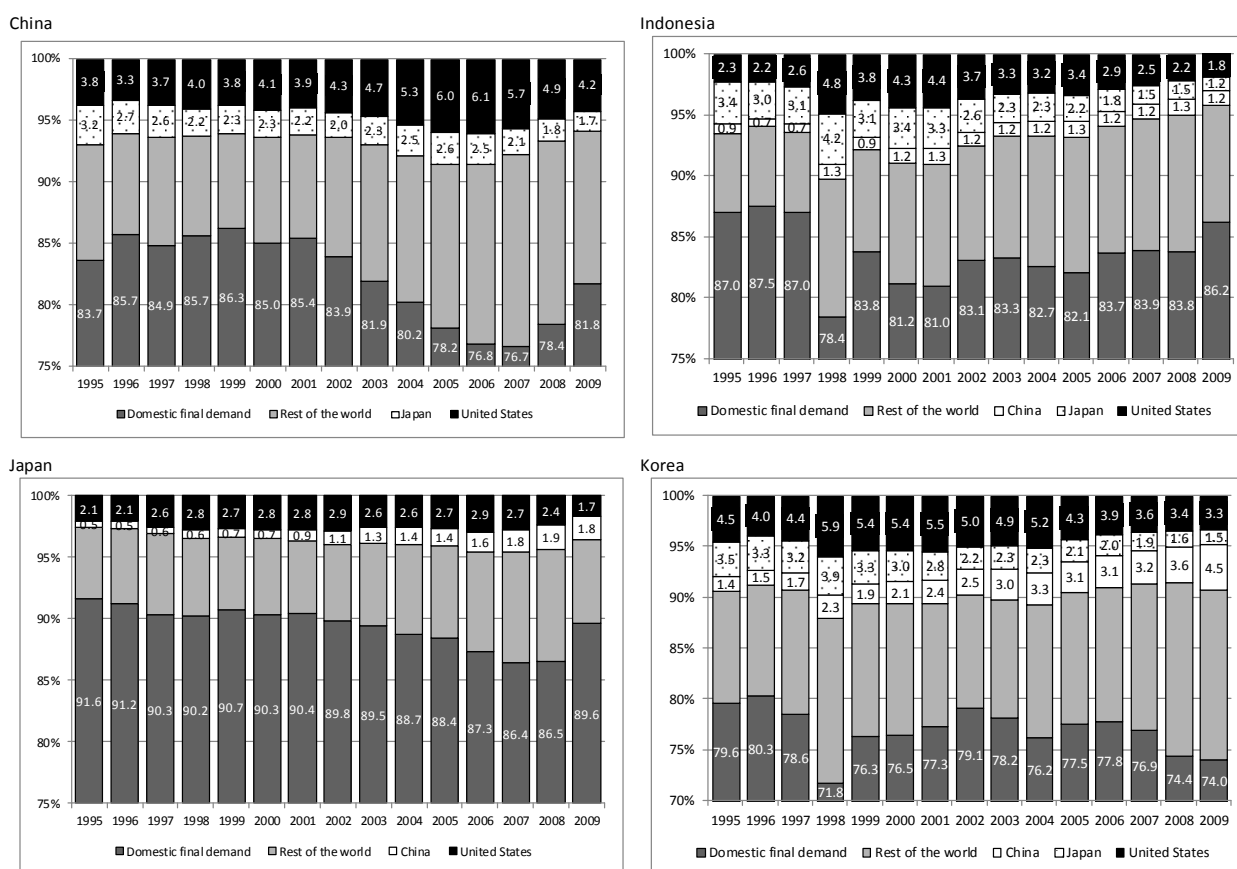
To answer these questions, we use Equation (3) but the analysis is slightly different from the analysis in Section 3. To see the difference between the analyses in Sections 3 and 4, let us go back to Figure 1. Without loss of generality, let us focus on Country 1. In Section 3, in examining the effects of exports on employment in Country 1, we focused on final use in Countries 2 and 3: $f_{12}(s) + f_{13}(s)$. In Section 4, in examining the effects of the final demand in Country 2 on employment in Country 1, we focus on the final use in Country 2: $f_{12}(s) + f_{22}(s) + f_{32}(s)$, which consists of Country 2's domestic demand $f_{22}(s)$ and the imports of Country 2 from Countries 1 and 3: $f_{12}(s) + f_{32}(s)$. The analysis of this section, for example, can capture the effects of exports (for final use) from China (e.g. Country 3) to the United States (e.g. Country 2) on Japanese employment (e.g. Country 1).²⁴

Figure 3 presents the results. We decompose the implied employment from final demand into that from domestic and foreign final demand. Foreign final demand consists of China, Japan, the United States and the ROW. The share of implied employment from each country's final demand in total final demand (= domestic + foreign final demand) is also presented.²⁵ Three messages stand out from this figure. First, in all four study countries, the domestic final demand plays an important role in creating employment. More than 70% of employment depends upon the domestic final demand in all countries and all years.

²⁴ It may also be interesting to examine the effects of Chinese exports to the United States on employment in Japan, Korea and Indonesia. However, as we will see below, the effects of the US final demand is less than 10%. We therefore focus on the overall US final demand, leaving the decomposition of imports to the reader.

²⁵ In this section, total final demand is the total final demand of each country to remove the effects of other countries' exports. In the previous section, the total final demand is measured as the total final demand of all countries.

Figure 3. Implied Employment from Final Demand, by Country
(Percentages)



Note: The percentages refer to the shares of implied total employment from domestic and foreign final demand. The scale on the vertical axis in each panel is truncated at 75%, except for Korea which is truncated at 70%. Total final demand is the total final demand of each country. Details of the decomposition are presented in Annex Table A13.

Source: WIOD, November 2013 Release.

Second, the shares of Japanese and US final demand are decreasing in China, Indonesia and Korea in recent years. In Korea, for example, the shares of Japanese and US final demand were 5.9% and 3.9%, respectively, in 1998, declining to 3.3% and 1.5%, respectively, in 2009. Similar patterns are observed in China and Indonesia. In contrast, the share of Chinese final demand is gradually increasing in Japan and Korea. In 1998, the share of Chinese final demand in Japan and Korea was 0.6% and 2.3%, respectively, increasing to 1.8% and 4.5%, respectively, in 2009. It is remarkable that the share of implied employment from Chinese final demand exceeded that from the US final demand in both Japan and Korea in 2009. These results together imply that the effects of the final demand of China are outpacing those of Japan and the United States.

5. Summary and Policy Implications

In light of the importance of the relationship between exports and employment, this paper examined the effects of exports on employment in China, Indonesia, Japan and Korea. This paper utilised the World Input-Output Database (WIOD) for the period from 1995 to 2009, which enables us to estimate the effects of exports on each industry's employment (i.e. direct effects) and on other industries' employment (i.e. indirect effects) through intra-industry

linkages. This paper clarifies how employment of the four study countries depends upon exports and how such dependences changed over the period.

There are four major findings. First, at the aggregate level, the implied employment from exports - employment created through both direct and indirect effects from exports - increased in China, Japan and Korea. In Indonesia, it is almost constant due to the rapid increases in domestic final demand. Second, at the industry level, the implied employment from exports increased in machinery-related industries such as *Machinery, Nec, Electrical and Optical Equipment*, and *Transport Equipment* in China, Indonesia and Korea, as the exports of these industries expanded. Although this result does not necessarily mean that direct competition between developed and developing countries is increasing over the period, provides an indication that may be important for firms in developed countries to differentiate their products via quality upgrading or by moving up the value chain.

Third, although more than 80% of exports are from manufacturing industries in these four countries, the effects of exports on employment are not limited to manufacturing industries. Non-manufacturing industries account for between 40 and 60% of the implied employment from exports. A significant number of workers in non-manufacturing industries depend upon manufacturing exports through vertical inter-industry linkages. Finally, in 2009, the share of implied employment from Chinese final demand exceeded that from the US final demand in both Japan and Korea. This result implies that the effects of the final demand of China are outpacing those of Japan and the United States.

An implication of the overall results is that even in cases where an industry is not particularly directly export-oriented, the industry may still be subject to potential effects – positive or negative – of changes in export demand. An industry's export dependence will be large if downstream customers are highly export dependent. Producers need to be aware not only of the export dependence of their industry but also of the export dependence of their upstream producers and downstream customers in different industries. Even non-exporters can be significantly affected by external changes in demand through such intra-industry linkages. In identifying the potential risks of negative external shocks, it is important for policy makers to identify how much employment is created indirectly as well as directly by exports.

In conclusion, there are several research issues for the future that are worth mentioning. First, although this paper focused on the number of workers, the labour inputs can also be adjusted to consider hours worked. Building on the approach of Kiyota (2011), an interesting next step would be to extend the analysis to examine the differences in labour market adjustment to trade shocks in terms of hours worked as well as numbers employed.²⁶ Second, the data used in this paper are valued at current prices. This means that the changes in input coefficients reflect changes in prices as well as the changes in technology. In order to extract the effects of the changes in technology, it would be necessary to utilise the data valued at constant prices. Finally, for a deeper understanding of the relationship between trade and employment, it may also be useful to examine not only the effects of exports but also those of imports. The studies by Groshen, Hobijin, and McConnell (2005) and De Backer and Yamano (2008) may be helpful for use in extending the present analysis. Some of these issues will be explored in the next stage of the author's research.

²⁶

It would also be useful to differentiate between exporting and non-exporting firms in order to better capture relative differences in the labour productivity of firms in a particular industrial sector. Work is underway at OECD to explore this issue as part of the improvements being developed for the TiVA database.

Appendix - Evolution of Implied Employment from Exports in China and Indonesia, by Industry: Robustness Check

The analysis of this paper assumes that all workers reported in the WIOD data engage in market activities with the same productivity. However, there may be a concern that the agricultural sector in developing countries appears to be somewhat heterogeneous in its employment composition, with a mix of market (relatively high productivity) and non-market (relatively low productivity) labour utilisation. Some indications of this can be found in the literature (e.g. Bowlus, and Sicular, 2003, p. 570; Wang, 2008, pp. 115-16).

The information on the difference between market and non-market labour utilisation is usually not available in the input-output (IO) data, including the WIOD data. In light of this heterogeneity, some studies utilising input-output analysis such as OECD (2013) have excluded such industries as agriculture and public administration to focus on market activities (which they called business sector). Following this approach, we employ another extreme assumption to check the robustness of our results: namely, that negligibly small number of workers in China and Indonesia engage in market activities in agriculture. Using an approach similar to that of OECD (2013), we thus re-estimate the implied employment from exports in China and Indonesia with the employment of the agricultural sector zeroed out.

Annex Table A14 presents the results for China and Indonesia, which corresponds to the implied employment from exports in Tables 4 and 5, respectively. Although the numbers did change significantly due to the exclusion of the substantial employment in agriculture (see Tables A5 and A6), the major messages of the paper remain unchanged. At the industry level, exports and the shares of implied employment from exports increased in machinery-related industries such as *Machinery (NEC)*, *Electrical and Optical Equipment*, and *Transport Equipment* in China and Indonesia. Moreover, although more than 80% of exports in these countries are from manufacturing industries, the effects of exports on employment are not limited to manufacturing industries. A significant number of workers in non-manufacturing industries depend upon manufacturing exports through vertical inter-industry linkages. The results together indicate that our results are relatively robust even when the analysis takes into account the non-market activities in the agricultural sector in China and Indonesia.

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Table Annex

Annex Table A1. Evolution of Exports in China, by Industry

	Exports (billions of US dollars, nominal)														
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All industry	91.7	93.7	106.2	105.9	110.4	134.8	146.0	178.1	237.4	300.9	394.8	494.7	636.0	734.6	652.2
1 Agriculture, Hunting, Forestry and Fishing	2.7	2.3	1.8	1.7	1.7	1.6	1.9	2.2	2.6	2.9	3.7	4.2	4.6	5.4	6.3
2 Mining and Quarrying	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.0	0.1	0.4	0.6	0.6	0.8	1.4	0.8
3 Food, Beverages and Tobacco	8.1	8.4	9.4	8.6	8.1	9.0	9.1	9.9	11.8	14.5	18.3	22.9	26.8	29.2	27.9
4 Textiles and Textile Products	26.8	26.4	27.9	26.5	27.3	31.5	33.6	37.3	47.0	58.0	74.0	94.2	120.0	127.5	114.7
5 Leather, Leather and Footwear	7.1	7.4	7.7	7.3	7.4	9.2	10.0	11.3	13.7	16.2	19.6	22.7	27.1	31.9	28.8
6 Wood and Products of Wood and Cork	1.6	1.6	1.9	1.4	1.1	1.1	1.0	0.9	1.0	1.3	1.5	1.7	2.1	2.3	1.9
7 Pulp, Paper, Paper, Printing and Publishing	0.9	1.1	1.3	1.0	0.8	0.8	0.7	0.8	0.9	1.0	1.1	1.1	1.4	1.6	1.5
8 Coke, Refined Petroleum and Nuclear Fuel	0.3	0.3	0.5	0.4	0.4	0.7	0.9	1.3	1.5	1.8	1.7	1.5	1.4	2.5	1.7
9 Chemicals and Chemical Products	1.6	2.1	3.0	2.7	2.7	2.9	2.9	3.2	4.9	7.2	9.4	10.3	13.9	17.0	16.0
10 Rubber and Plastics	2.9	3.5	4.2	4.1	4.1	4.3	4.4	4.9	5.9	7.1	9.8	11.5	14.0	15.9	14.7
11 Other Non-Metallic Mineral	1.8	2.1	2.6	2.5	2.4	2.7	2.3	1.9	2.2	2.5	3.0	2.9	3.3	4.2	3.7
12 Basic Metals and Fabricated Metal	4.1	4.2	4.8	4.1	3.8	3.9	3.5	3.4	4.6	6.7	8.6	9.9	13.4	16.3	13.6
13 Machinery, Nec	3.4	3.7	4.5	4.7	5.4	7.1	8.6	10.9	16.0	23.6	30.8	38.0	59.9	71.6	60.2
14 Electrical and Optical Equipment	19.4	19.6	21.7	25.1	27.8	37.3	40.6	54.0	82.6	110.6	155.2	200.4	251.7	291.7	256.2
15 Transport Equipment	1.3	1.5	2.2	2.2	2.3	2.6	2.8	3.2	5.9	7.1	10.4	14.3	23.2	29.0	26.0
16 Manufacturing, Nec; Recycling	4.0	4.2	4.5	5.0	6.2	8.4	10.1	14.6	15.3	14.4	17.9	25.1	33.5	39.7	37.0
17 Electricity, Gas and Water Supply	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.4	0.3
18 Construction	0.3	0.2	0.1	0.2	0.2	0.3	0.3	0.4	0.6	0.8	1.1	1.4	1.9	2.8	2.5
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	0.0	0.0	1.7	1.7	1.7	2.2	2.5	3.1	3.7	4.5	5.1	5.7	6.3	7.4	6.2
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	0.0	0.0	1.8	1.7	1.8	2.3	2.6	3.3	3.9	4.7	5.3	5.9	6.6	7.8	6.5
22 Hotels and Restaurants	1.5	1.6	0.9	0.8	0.8	1.0	1.0	1.2	1.5	1.9	2.2	2.9	3.5	4.4	5.5
23 Inland Transport	0.4	0.3	0.2	0.3	0.3	0.5	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.2	1.8
24 Water Transport	0.3	0.3	0.3	0.4	0.5	0.7	0.9	1.5	2.0	2.6	3.1	3.8	4.7	5.7	4.8
25 Air Transport	0.7	0.7	0.7	0.9	0.8	1.1	1.3	1.7	2.2	2.9	3.8	4.7	5.7	7.0	5.6
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	0.5	0.5	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.4
27 Post and Telecommunications	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.6	0.7	0.9	1.2	1.4	1.2
28 Financial Intermediation	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.2
29 Real Estate Activities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30 Renting of M&Eq and Other Business Activities	0.1	0.1	0.1	0.4	0.4	0.5	0.6	0.7	1.0	1.4	1.8	2.4	3.0	3.6	3.0
31 Public Admin and Defence; Compulsory Social Security	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3
32 Education	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
33 Health and Social Work	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3
34 Other Community, Social and Personal Services	1.0	1.1	1.3	1.4	1.6	2.2	3.0	4.7	4.3	4.0	3.3	2.9	2.7	3.1	2.6

Source: WIOD, November 2013 Release.

Annex Table A2. Evolution of Exports in Indonesia, by Industry

	Exports (billions of US dollars, nominal)															
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
All industry	15.9	18.2	19.3	15.2	15.8	20.1	19.9	19.3	19.4	19.0	21.5	24.1	26.8	31.1	27.9	
1 Agriculture, Hunting, Forestry and Fishing	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	
2 Mining and Quarrying	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3 Food, Beverages and Tobacco	2.1	2.3	2.4	2.0	1.8	2.2	2.0	2.1	1.9	1.8	2.0	2.1	2.7	2.9	2.5	
4 Textiles and Textile Products	3.4	4.0	4.3	3.4	3.6	4.7	4.6	4.1	4.5	4.7	5.0	5.8	6.0	6.3	5.7	
5 Leather, Leather and Footwear	1.6	1.7	1.6	1.1	1.0	1.2	1.2	1.0	1.1	1.2	1.2	1.4	1.5	1.7	1.5	
6 Wood and Products of Wood and Cork	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
7 Pulp, Paper, Paper, Printing and Publishing	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	
8 Coke, Refined Petroleum and Nuclear Fuel	1.4	1.7	1.7	1.3	1.3	1.8	1.7	1.7	1.3	1.0	1.1	1.4	1.5	1.8	0.9	
9 Chemicals and Chemical Products	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	
10 Rubber and Plastics	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.5	
11 Other Non-Metallic Mineral	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	
12 Basic Metals and Fabricated Metal	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
13 Machinery, Nec	0.5	0.6	0.7	0.8	1.0	1.3	1.1	1.3	1.2	1.1	1.2	1.6	2.2	3.2	3.1	
14 Electrical and Optical Equipment	2.0	2.6	3.0	2.8	3.3	4.1	4.3	4.3	3.9	3.1	3.7	3.6	3.7	4.1	4.4	
15 Transport Equipment	0.3	0.4	0.4	0.2	0.1	0.2	0.1	0.1	0.2	0.3	0.6	0.7	1.4	1.6	1.0	
16 Manufacturing, Nec; Recycling	1.6	1.9	2.1	1.2	1.6	2.2	2.3	2.3	2.4	2.5	2.5	2.6	2.8	2.9	2.6	
17 Electricity, Gas and Water Supply	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18 Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4	
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.5	0.4	
22 Hotels and Restaurants	0.8	0.9	0.7	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.6	0.7	0.9	
23 Inland Transport	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.4	
24 Water Transport	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	
25 Air Transport	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
27 Post and Telecommunications	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	
28 Financial Intermediation	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	
29 Real Estate Activities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.5	
30 Renting of M&Eq and Other Business Activities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
31 Public Admin and Defence; Compulsory Social Security	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	
32 Education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	
33 Health and Social Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
34 Other Community, Social and Personal Services	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	1.1	0.8	

Source: WIOD, November 2013 Release.

Annex Table A3. Evolution of Exports in Japan, by Industry

	Exports (billions of US dollars, nominal)														
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All industry	186.8	173.6	177.1	180.4	191.3	206.9	174.6	183.4	204.9	225.7	236.2	251.7	267.5	290.4	206.2
1 Agriculture, Hunting, Forestry and Fishing	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3
2 Mining and Quarrying	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.3
3 Food, Beverages and Tobacco	1.6	1.4	1.6	1.4	1.2	1.3	1.5	1.5	1.6	1.8	2.0	2.2	2.4	2.6	2.8
4 Textiles and Textile Products	0.8	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.8	1.0	0.8	0.8	0.8	0.9	0.7
5 Leather, Leather and Footwear	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
6 Wood and Products of Wood and Cork	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
7 Pulp, Paper, Paper, Printing and Publishing	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.6	0.5
8 Coke, Refined Petroleum and Nuclear Fuel	0.5	0.4	0.5	0.3	0.3	0.5	0.5	0.4	0.4	0.5	1.0	1.4	2.2	2.8	1.4
9 Chemicals and Chemical Products	4.3	4.0	4.1	4.1	4.8	5.0	4.9	5.5	6.0	6.7	7.1	6.9	7.6	7.5	7.0
10 Rubber and Plastics	1.2	1.2	1.1	1.1	1.3	1.6	1.5	1.6	1.9	2.0	2.4	2.4	2.6	2.8	2.5
11 Other Non-Metallic Mineral	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2
12 Basic Metals and Fabricated Metal	5.0	4.0	3.8	3.8	3.7	3.3	3.2	3.2	3.5	3.7	4.2	4.7	4.9	6.8	5.4
13 Machinery, Nec	45.3	42.1	36.2	36.1	38.6	47.0	35.4	33.3	41.0	44.2	45.6	46.0	41.1	54.6	33.6
14 Electrical and Optical Equipment	55.5	50.1	52.2	50.2	52.5	59.2	47.1	46.5	48.9	52.0	50.9	51.3	53.2	55.4	45.4
15 Transport Equipment	49.1	43.4	49.1	56.7	61.0	59.8	56.1	66.2	71.2	79.4	85.2	97.3	109.3	114.7	72.3
16 Manufacturing, Nec; Recycling	3.4	3.3	3.7	3.9	5.1	4.1	3.7	3.8	3.2	3.5	4.5	4.2	4.8	5.0	3.8
17 Electricity, Gas and Water Supply	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.2	0.1
18 Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	3.7	6.3	7.2	7.4	7.3	7.5	5.7	5.4	8.0	8.9	11.0	12.7	14.6	11.2	10.5
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	0.4	0.7	0.7	0.6	0.5	0.6	0.5	0.5	0.8	1.0	1.0	1.2	1.6	1.2	1.1
22 Hotels and Restaurants	1.6	3.3	3.2	3.0	2.7	2.7	2.5	2.7	3.9	4.6	4.5	4.1	4.6	5.0	3.7
23 Inland Transport	1.5	1.6	1.4	1.6	1.8	2.1	1.5	1.6	2.0	2.5	2.6	2.7	2.7	3.1	2.9
24 Water Transport	4.4	5.0	5.0	3.8	4.0	4.5	4.3	4.3	4.9	5.8	5.4	5.9	7.1	7.8	6.2
25 Air Transport	1.1	1.7	1.7	2.1	2.1	2.8	2.3	2.5	2.6	3.1	2.9	2.5	2.4	2.7	1.8
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	0.6	0.5	0.4	0.3	0.3	0.5	0.3	0.3	0.5	0.7	0.7	0.8	0.8	0.9	0.7
27 Post and Telecommunications	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28 Financial Intermediation	0.9	1.1	1.1	1.1	1.1	0.7	1.0	1.0	0.8	0.9	1.0	1.2	1.3	1.4	1.0
29 Real Estate Activities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30 Renting of M&Eq and Other Business Activities	0.5	0.7	0.5	0.5	0.4	1.0	0.4	0.4	0.9	1.0	0.7	1.1	1.1	1.1	0.8
31 Public Admin and Defence; Compulsory Social Security	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1
32 Education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33 Health and Social Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1
34 Other Community, Social and Personal Services	3.9	0.6	1.4	0.5	0.4	0.3	0.4	0.7	0.6	0.6	0.7	0.6	0.6	0.7	0.5

Source: WIOD, November 2013 Release.

Annex Table A4. Evolution of Exports in Korea, by Industry

	Exports (billions of US dollars, nominal)														
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All industry	54.0	56.8	59.3	57.9	65.2	79.6	72.4	78.4	93.0	106.9	109.7	121.0	133.8	151.6	132.3
1 Agriculture, Hunting, Forestry and Fishing	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3
2 Mining and Quarrying	0.0	-0.2	-0.1	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0
3 Food, Beverages and Tobacco	2.2	2.5	2.7	2.3	2.5	2.4	2.3	2.5	2.7	3.1	3.1	3.2	3.8	4.3	4.2
4 Textiles and Textile Products	7.7	6.8	7.3	7.6	7.7	7.8	6.9	7.0	6.9	7.0	5.7	5.0	4.9	4.4	3.6
5 Leather, Leather and Footwear	1.7	1.6	1.4	1.1	1.1	1.1	0.9	0.7	0.6	0.5	0.5	0.4	0.5	0.4	0.3
6 Wood and Products of Wood and Cork	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 Pulp, Paper, Paper, Printing and Publishing	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.5	0.3
8 Coke, Refined Petroleum and Nuclear Fuel	0.6	1.0	1.1	0.8	1.2	2.0	1.9	1.5	1.7	2.0	2.7	3.4	4.1	5.5	3.8
9 Chemicals and Chemical Products	1.0	1.0	1.1	0.8	0.8	0.8	0.9	0.9	1.1	1.4	1.4	1.7	2.0	2.2	2.0
10 Rubber and Plastics	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.9	0.8	0.9	0.9	0.7
11 Other Non-Metallic Mineral	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12 Basic Metals and Fabricated Metal	0.8	0.6	0.7	0.6	0.7	0.7	0.7	0.8	0.6	0.7	0.9	0.8	0.9	1.1	1.2
13 Machinery, Nec	5.7	6.6	6.2	6.1	6.4	7.6	7.4	8.4	10.5	11.1	12.6	14.0	17.5	21.8	16.8
14 Electrical and Optical Equipment	12.2	12.2	12.4	12.9	18.3	24.4	21.6	24.9	30.9	31.7	31.8	35.8	34.0	34.8	31.7
15 Transport Equipment	12.7	15.4	16.4	15.5	15.3	19.8	18.8	21.0	25.4	35.4	36.4	41.2	47.9	56.4	52.3
16 Manufacturing, Nec; Recycling	2.0	2.0	1.9	1.9	1.9	2.1	1.9	1.7	2.2	2.0	1.8	1.8	1.7	1.4	1.3
17 Electricity, Gas and Water Supply	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18 Construction	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	0.8	0.8	0.8	0.7	0.8	0.9	0.8	0.8	1.0	1.2	1.4	1.5	1.9	2.1	1.6
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	0.7	0.8	1.1	1.2	1.5	2.0	1.5	1.3	1.4	1.6	1.5	1.7	2.1	2.2	1.7
22 Hotels and Restaurants	0.6	0.7	0.9	0.9	1.1	1.5	1.2	1.1	1.2	1.3	1.2	1.4	1.7	1.9	1.5
23 Inland Transport	0.3	0.3	0.4	0.4	0.4	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1
24 Water Transport	1.8	1.5	1.6	1.9	2.0	1.9	1.6	1.8	2.2	2.9	3.3	3.5	4.5	5.6	4.6
25 Air Transport	0.8	0.8	0.9	1.0	0.9	1.1	1.0	1.0	1.2	1.5	1.5	1.5	1.8	1.7	1.2
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
27 Post and Telecommunications	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
28 Financial Intermediation	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.4
29 Real Estate Activities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
30 Renting of M&Eq and Other Business Activities	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.9	0.7
31 Public Admin and Defence; Compulsory Social Security	0.6	0.7	0.7	0.7	0.8	0.9	0.7	0.8	0.8	0.7	0.7	0.8	1.0	1.1	0.9
32 Education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33 Health and Social Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34 Other Community, Social and Personal Services	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.4

Source: WIOD, November 2013 Release.

Annex Table A5. Evolution of Employment in China, by Industry

	Number of persons engaged (thousands)														
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All industry	680 650	689 500	698 200	706 370	713 940	720 850	730 250	737 400	744 320	752 000	758 250	764 000	769 900	774 800	779 950
1 Agriculture, Hunting, Forestry and Fishing	355 300	348 200	348 410	351 770	357 680	360 430	365 130	368 700	365 460	352 690	339 700	325 610	314 440	306 540	297 080
2 Mining and Quarrying	12 908	12 849	12 586	10 926	9 730	8 848	8 385	8 193	8 414	8 906	9 102	9 553	9 747	9 867	10 136
3 Food, Beverages and Tobacco	10 592	10 949	12 525	13 618	13 563	12 783	12 487	11 348	10 532	11 379	13 730	14 056	14 643	14 728	15 129
4 Textiles and Textile Products	15 662	15 539	15 215	16 028	15 668	15 363	15 751	15 446	16 524	18 463	19 355	20 574	21 872	21 805	22 399
5 Leather, Leather and Footwear	2 533	2 624	2 973	3 921	3 986	4 113	3 954	3 857	4 379	5 291	5 714	6 129	6 542	6 603	6 783
6 Wood and Products of Wood and Cork	3 345	3 693	4 293	4 803	4 965	5 059	5 237	4 953	5 797	7 427	8 056	8 811	9 678	10 014	10 287
7 Pulp, Paper, Printing and Publishing	4 526	4 849	5 238	5 731	6 131	6 207	6 386	6 085	5 266	6 041	9 181	10 043	11 085	11 547	11 862
8 Coke, Refined Petroleum and Nuclear Fuel	932	925	952	906	874	804	764	715	757	800	871	890	931	943	969
9 Chemicals and Chemical Products	7 506	7 633	7 625	6 136	6 648	6 260	6 447	6 309	6 519	6 364	6 844	7 253	7 787	8 014	8 232
10 Rubber and Plastics	4 789	5 182	6 213	7 090	7 502	7 517	7 422	7 042	7 783	9 611	10 151	10 853	11 725	11 918	12 243
11 Other Non-Metallic Mineral	13 412	14 269	13 565	12 033	9 292	8 952	9 274	9 050	9 133	8 612	8 724	8 761	8 986	8 416	8 645
12 Basic Metals and Fabricated Metal	10 324	10 359	10 268	9 178	8 497	8 202	8 217	7 895	8 029	8 274	8 561	8 913	9 461	9 782	10 048
13 Machinery, Nec	10 020	10 041	9 902	7 415	7 170	6 890	7 398	7 304	8 082	8 592	9 161	9 942	11 098	11 713	12 032
14 Electrical and Optical Equipment	6 975	7 050	7 490	7 803	7 952	8 416	7 989	7 941	8 928	10 202	11 324	12 632	14 291	15 454	15 875
15 Transport Equipment	4 581	4 776	4 636	3 837	4 132	4 038	3 956	3 973	4 269	4 438	4 745	5 135	5 705	6 118	6 284
16 Manufacturing, Nec; Recycling	9 282	10 141	8 688	11 555	10 719	10 036	8 883	7 791	7 431	8 249	7 996	7 965	7 979	7 774	7 986
17 Electricity, Gas and Water Supply	2 822	2 816	3 033	2 763	3 083	3 212	3 196	3 224	3 401	3 639	3 710	3 864	3 946	3 909	4 016
18 Construction	36 340	38 336	40 270	42 256	44 299	45 488	47 094	46 674	45 526	42 913	43 614	46 875	50 813	52 484	53 914
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	10 415	11 206	11 706	11 737	11 848	11 981	11 908	12 414	12 990	13 592	13 711	13 952	14 020	14 376	14 871
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	28 016	30 143	31 487	31 571	31 869	32 227	32 030	33 391	34 941	36 559	36 879	37 528	37 712	38 669	40 001
22 Hotels and Restaurants	10 531	11 331	11 836	11 868	11 979	12 114	12 040	12 552	13 134	15 138	16 856	18 357	18 964	19 923	20 609
23 Inland Transport	13 406	14 225	14 319	14 376	14 344	14 757	14 570	14 809	15 497	16 415	17 102	17 363	17 778	18 531	19 170
24 Water Transport	1 762	1 870	1 883	1 890	1 886	1 940	1 916	1 947	2 037	2 020	2 022	2 008	1 920	1 893	1 958
25 Air Transport	554	588	592	594	593	610	602	612	640	804	855	916	956	1 069	1 105
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	2 076	2 203	2 217	2 226	2 221	2 285	2 256	2 293	2 400	2 460	2 109	2 297	2 142	2 108	2 181
27 Post and Telecommunications	4 356	4 622	4 653	4 671	4 661	4 795	4 734	4 812	5 035	5 682	6 199	6 704	6 854	7 000	7 241
28 Financial Intermediation	3 056	3 322	3 423	3 501	3 789	3 682	3 836	3 889	3 991	4 174	4 311	4 464	4 519	4 664	4 825
29 Real Estate Activities	886	956	967	1 048	1 109	1 131	1 227	1 355	1 390	1 454	1 502	1 555	1 574	1 625	1 681
30 Renting of M&Eq and Other Business Activities	3 510	3 549	3 501	3 278	3 281	3 207	3 082	2 980	3 058	3 198	3 304	3 421	3 463	3 574	3 697
31 Public Admin and Defence; Compulsory Social Security	11 538	12 433	12 149	12 231	12 730	12 434	12 571	12 299	12 620	13 199	13 635	14 118	14 292	14 751	15 259
32 Education	16 343	17 211	17 306	17 538	18 113	17 630	17 903	17 912	18 380	19 222	19 857	20 561	20 814	21 483	22 223
33 Health and Social Work	4 916	5 210	5 235	5 329	5 568	5 498	5 630	5 645	5 792	6 058	6 258	6 480	6 560	6 770	7 003
34 Other Community, Social and Personal Services	57 435	60 402	63 045	66 741	68 061	73 940	77 974	83 990	86 184	90 135	93 112	96 414	97 601	100 735	104 205

Source: WIOD, November 2013 Release.

Annex Table A6. Evolution of Employment in Indonesia, by Industry

	Number of persons engaged (thousands)														
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All industry	87 271	88 910	90 204	90 827	92 114	93 321	93 437	93 655	94 323	94 695	95 464	97 880	103 349	105 753	108 203
1 Agriculture, Hunting, Forestry and Fishing	40 515	39 834	37 290	40 383	38 731	40 434	39 577	40 534	43 013	40 652	41 933	40 725	41 797	41 924	42 208
2 Mining and Quarrying	831	863	1 016	777	849	826	772	720	818	1 131	866	884	950	1 022	1 103
3 Food, Beverages and Tobacco	3 764	3 536	3 469	2 895	3 163	3 013	2 831	2 568	2 206	1 923	1 832	1 823	1 895	1 922	1 967
4 Textiles and Textile Products	1 536	1 564	1 663	1 505	1 782	1 840	1 994	2 085	2 066	2 077	2 281	2 269	2 359	2 393	2 449
5 Leather, Leather and Footwear	534	544	578	523	619	640	638	615	561	519	525	522	543	551	563
6 Wood and Products of Wood and Cork	2 102	2 129	2 251	2 026	2 386	2 450	2 530	2 522	2 381	2 281	2 388	2 376	2 470	2 506	2 564
7 Pulp, Paper, Paper, Printing and Publishing	219	236	266	255	320	350	399	438	456	482	556	553	575	583	597
8 Coke, Refined Petroleum and Nuclear Fuel	29	31	36	35	44	49	57	65	70	76	91	90	94	95	98
9 Chemicals and Chemical Products	211	222	244	228	279	297	310	312	297	287	304	302	314	319	326
10 Rubber and Plastics	850	844	874	771	890	896	967	1 008	995	997	1 091	1 085	1 128	1 145	1 171
11 Other Non-Metallic Mineral	858	797	773	638	689	649	723	777	791	817	922	917	953	967	990
12 Basic Metals and Fabricated Metal	352	347	357	312	358	358	394	419	422	431	481	478	497	504	516
13 Machinery, Nec	108	108	114	101	119	121	117	110	97	87	86	86	89	90	92
14 Electrical and Optical Equipment	123	124	130	116	136	138	167	195	216	242	296	295	306	311	318
15 Transport Equipment	474	465	476	415	473	470	493	498	477	464	493	490	509	517	529
16 Manufacturing, Nec; Recycling	517	518	542	482	562	571	599	606	581	565	600	597	620	629	644
17 Electricity, Gas and Water Supply	187	181	263	171	224	226	214	203	167	242	191	221	163	187	208
18 Construction	3 768	4 012	4 579	3 960	3 961	4 183	4 445	4 793	4 403	4 774	4 498	4 626	5 142	5 325	5 372
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	8 213	8 703	9 209	8 897	9 177	9 578	9 115	9 352	8 999	9 900	9 709	10 070	9 564	9 924	10 264
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	4 918	5 212	5 515	5 328	5 496	5 736	5 459	5 601	5 600	6 400	6 518	6 760	6 421	6 662	6 890
22 Hotels and Restaurants	752	963	1 231	1 436	1 790	2 256	2 124	2 157	2 083	2 302	2 267	3 302	5 898	5 965	6 169
23 Inland Transport	2 936	3 095	3 178	3 122	3 093	3 277	3 093	3 139	3 207	3 438	3 365	3 371	3 543	3 674	3 638
24 Water Transport	411	425	428	412	400	415	441	504	580	701	773	774	813	844	835
25 Air Transport	41	46	51	54	57	65	72	86	103	130	150	150	158	164	162
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	286	353	425	490	569	707	629	602	579	585	540	541	569	590	584
27 Post and Telecommunications	100	136	181	231	297	407	436	501	581	706	783	784	824	855	846
28 Financial Intermediation	478	500	474	444	453	628	754	622	770	622	541	649	705	736	749
29 Real Estate Activities	54	60	62	66	76	121	294	324	483	441	426	474	464	480	479
30 Renting of M&Eq and Other Business Activities	264	321	350	376	440	698	739	572	682	548	478	548	546	573	594
31 Public Admin and Defence; Compulsory Social Security	2 958	3 376	3 979	4 269	4 606	3 946	4 301	3 841	3 459	3 507	3 346	3 654	3 445	3 242	3 466
32 Education	4 591	4 840	5 271	5 225	5 208	4 122	4 644	4 286	3 989	4 179	4 120	4 539	4 923	4 676	4 998
33 Health and Social Work	834	880	958	949	946	749	882	851	827	906	933	1 003	977	1 064	1 138
34 Other Community, Social and Personal Services	3 457	3 645	3 970	3 935	3 922	3 105	3 229	2 751	2 363	2 286	2 080	2 921	4 095	5 314	5 679

Source: WIOD, November 2013 Release.

Annex Table A7. Evolution of Employment in Japan, by Industry

	Number of persons engaged (thousands)														
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All industry	53 767	54 252	54 767	54 304	53 699	53 778	53 800	53 220	53 165	53 333	53 676	54 501	54 736	53 523	49 344
1 Agriculture, Hunting, Forestry and Fishing	454	453	437	430	413	458	461	444	453	444	453	467	467	458	424
2 Mining and Quarrying	93	90	87	87	82	79	74	70	66	61	57	55	53	45	43
3 Food, Beverages and Tobacco	1 477	1 475	1 474	1 420	1 417	1 431	1 431	1 412	1 399	1 380	1 336	1 376	1 417	1 390	1 381
4 Textiles and Textile Products	961	899	862	790	726	650	581	519	485	450	427	420	396	415	364
5 Leather, Leather and Footwear	61	60	57	53	50	47	44	39	37	36	35	34	33	30	22
6 Wood and Products of Wood and Cork	507	492	481	439	423	412	384	348	337	320	315	313	300	284	236
7 Pulp, Paper, Paper, Printing and Publishing	982	955	954	927	901	891	854	817	794	773	751	758	748	722	711
8 Coke, Refined Petroleum and Nuclear Fuel	28	26	26	24	21	20	19	18	18	18	18	19	19	21	16
9 Chemicals and Chemical Products	516	500	507	495	479	495	479	453	437	424	419	435	420	371	384
10 Rubber and Plastics	706	683	690	666	670	681	662	633	631	632	623	641	655	609	501
11 Other Non-Metallic Mineral	491	471	471	448	420	427	409	364	352	336	326	333	319	289	207
12 Basic Metals and Fabricated Metal	1 959	1 974	1 960	1 871	1 803	1 761	1 750	1 684	1 644	1 603	1 636	1 652	1 671	1 562	1 229
13 Machinery, Nec	1 238	1 253	1 260	1 226	1 195	1 176	1 144	1 102	1 070	1 066	1 059	1 080	1 074	1 056	691
14 Electrical and Optical Equipment	2 009	2 040	2 056	1 992	1 959	1 925	1 887	1 723	1 689	1 662	1 646	1 677	1 737	1 560	1 207
15 Transport Equipment	1 133	1 144	1 152	1 108	1 089	1 070	1 100	1 128	1 151	1 147	1 195	1 253	1 290	1 190	901
16 Manufacturing, Nec; Recycling	285	272	268	265	246	240	228	212	198	184	189	187	180	160	135
17 Electricity, Gas and Water Supply	441	444	445	448	449	446	449	442	435	430	426	422	418	361	439
18 Construction	5 587	5 596	5 641	5 400	5 286	5 167	4 988	4 855	4 723	4 532	4 409	4 398	4 332	4 128	4 052
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	343	358	375	387	396	387	377	390	400	414	398	384	383	379	330
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	4 216	4 195	4 196	4 152	4 115	3 884	3 692	3 616	3 573	3 572	3 573	3 493	3 503	3 458	3 021
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	4 840	4 997	4 955	4 915	4 829	4 964	5 120	5 011	4 955	4 871	4 805	4 889	4 887	4 824	4 213
22 Hotels and Restaurants	3 347	3 390	3 481	3 561	3 577	3 613	3 711	3 710	3 709	3 747	3 761	3 745	3 768	3 806	3 308
23 Inland Transport	2 461	2 512	2 494	2 427	2 407	2 415	2 352	2 313	2 370	2 364	2 306	2 373	2 378	2 417	2 188
24 Water Transport	201	199	193	183	175	170	158	149	147	141	133	138	139	129	116
25 Air Transport	55	57	57	56	56	57	53	50	49	47	44	45	45	41	37
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	419	433	428	415	407	407	396	387	392	391	381	392	393	397	359
27 Post and Telecommunications	571	575	580	574	577	609	618	594	594	581	574	598	601	611	618
28 Financial Intermediation	2 017	1 964	1 921	1 924	1 860	1 804	1 728	1 732	1 662	1 648	1 654	1 685	1 715	1 469	1 348
29 Real Estate Activities	794	787	809	844	845	831	840	828	780	770	777	775	796	803	810
30 Renting of M&Eq and Other Business Activities	3 795	3 926	4 065	4 160	4 147	4 399	4 712	4 807	4 917	5 093	5 446	5 780	5 847	5 786	5 134
31 Public Admin and Defence; Compulsory Social Security	2 987	3 016	3 059	3 095	3 113	3 195	3 247	3 421	3 613	3 834	4 034	4 209	4 201	4 253	4 216
32 Education	1 965	1 986	2 029	2 048	2 054	2 023	2 013	2 022	2 036	2 073	2 083	2 086	2 090	2 055	2 075
33 Health and Social Work	3 678	3 796	3 985	4 122	4 204	4 311	4 441	4 528	4 638	4 824	4 952	4 968	5 028	5 087	5 190
34 Other Community, Social and Personal Services	3 148	3 233	3 312	3 352	3 305	3 333	3 399	3 399	3 411	3 463	3 436	3 420	3 433	3 358	3 436

Source: WIOD, November 2013 Release.

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Annex Table A8. Evolution of Employment in Korea, by Industry

	Number of persons engaged (thousands)														
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All industry	20 398	20 837	21 201	19 918	20 277	21 136	21 557	22 152	22 117	22 534	22 830	23 133	23 418	23 561	23 490
1 Agriculture, Hunting, Forestry and Fishing	2 403	2 323	2 285	2 397	2 302	2 243	2 148	2 069	1 950	1 825	1 815	1 785	1 726	1 737	1 731
2 Mining and Quarrying	26	23	26	20	19	17	18	18	17	16	17	18	18	18	18
3 Food, Beverages and Tobacco	301	302	289	255	289	291	263	285	279	284	273	256	251	252	252
4 Textiles and Textile Products	770	682	590	495	543	608	573	521	487	447	395	329	303	305	304
5 Leather, Leather and Footwear	123	99	87	65	78	90	80	69	63	57	50	42	34	34	34
6 Wood and Products of Wood and Cork	50	44	41	28	37	39	34	39	39	40	37	40	35	35	35
7 Pulp, Paper, Paper, Printing and Publishing	255	260	249	200	252	242	243	251	247	250	230	226	215	216	216
8 Coke, Refined Petroleum and Nuclear Fuel	42	46	50	59	59	62	57	69	62	71	68	65	58	58	58
9 Chemicals and Chemical Products	285	284	288	266	242	239	223	235	228	219	210	207	200	201	201
10 Rubber and Plastics	238	240	224	193	192	216	231	245	260	285	293	289	290	291	291
11 Other Non-Metallic Mineral	224	219	208	155	147	173	149	156	142	148	146	135	131	132	132
12 Basic Metals and Fabricated Metal	503	485	461	390	420	456	498	475	468	464	504	519	542	545	543
13 Machinery, Nec	503	500	477	394	386	446	440	441	464	465	463	458	476	479	478
14 Electrical and Optical Equipment	867	862	834	769	798	759	840	812	818	890	901	905	890	895	892
15 Transport Equipment	502	558	598	534	462	525	496	503	511	538	542	566	582	585	583
16 Manufacturing, Nec; Recycling	155	143	140	115	122	147	141	141	136	132	121	130	114	115	115
17 Electricity, Gas and Water Supply	70	75	78	61	62	64	58	52	76	72	71	76	86	87	86
18 Construction	1 913	1 983	2 027	1 580	1 475	1 580	1 585	1 746	1 816	1 820	1 814	1 835	1 850	1 861	1 856
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	218	223	234	203	236	223	232	240	251	233	235	234	235	237	236
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	1 554	1 590	1 592	1 549	1 594	1 563	1 598	1 614	1 551	1 529	1 504	1 488	1 444	1 453	1 448
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	2 029	2 096	2 137	2 070	2 094	2 048	2 101	2 137	2 069	2 042	2 009	1 991	1 998	2 010	2 004
22 Hotels and Restaurants	1 614	1 782	1 908	1 748	1 816	1 919	1 943	2 007	1 981	2 057	2 058	2 049	2 049	2 062	2 055
23 Inland Transport	476	489	479	438	470	457	503	532	496	486	513	530	528	531	530
24 Water Transport	229	243	290	336	318	319	316	274	288	318	317	303	345	347	346
25 Air Transport	110	114	120	117	129	140	137	149	128	132	134	137	141	142	141
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	138	145	150	136	142	151	158	185	172	191	185	193	200	201	201
27 Post and Telecommunications	123	129	136	135	141	192	208	231	249	248	279	308	284	286	285
28 Financial Intermediation	730	758	782	774	737	752	760	734	751	738	746	786	809	814	811
29 Real Estate Activities	261	265	293	265	354	340	369	405	415	447	490	494	496	499	497
30 Renting of M&Eq and Other Business Activities	662	763	844	825	842	1 021	1 161	1 259	1 311	1 467	1 547	1 675	1 854	1 866	1 860
31 Public Admin and Defence; Compulsory Social Security	650	644	658	745	870	758	701	702	757	768	791	801	797	802	799
32 Education	1 028	1 073	1 119	1 154	1 137	1 191	1 236	1 335	1 484	1 507	1 568	1 658	1 687	1 697	1 692
33 Health and Social Work	308	311	334	367	392	428	484	551	539	594	646	686	745	750	747
34 Other Community, Social and Personal Services	1 039	1 085	1 173	1 081	1 121	1 437	1 574	1 671	1 611	1 752	1 857	1 919	2 007	2 019	2 013

Source: WIOD, November 2013 Release.

Annex Table A9. Evolution of Implied Employment from Exports in China, by Industry

	Number of persons engaged (thousands)														
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All industry	62 091	54 932	56 951	55 620	53 633	56 930	57 503	64 076	73 160	80 096	89 706	95 704	99 345	90 152	79 808
1 Agriculture, Hunting, Forestry and Fishing	28 493	23 905	22 899	21 464	20 525	21 065	21 500	23 400	28 356	30 294	36 167	39 533	38 594	32 924	29 040
2 Mining and Quarrying	1 230	1 089	1 141	931	798	759	693	709	883	1 004	1 172	1 286	1 380	1 291	1 134
3 Food, Beverages and Tobacco	1 145	1 009	1 142	1 168	1 098	1 098	1 049	1 021	1 047	1 228	1 648	1 770	1 745	1 543	1 446
4 Textiles and Textile Products	5 990	5 379	5 418	5 410	5 158	5 193	5 250	5 418	6 386	7 737	8 551	9 322	10 157	8 851	8 108
5 Leather, Leather and Footwear	940	854	952	1 214	1 243	1 461	1 410	1 511	1 841	2 480	2 780	2 864	2 996	2 801	2 556
6 Wood and Products of Wood and Cork	567	553	663	618	567	579	549	543	718	937	1 121	1 284	1 481	1 402	1 181
7 Pulp, Paper, Paper, Printing and Publishing	553	538	609	612	613	651	650	681	648	760	1 282	1 462	1 664	1 596	1 416
8 Coke, Refined Petroleum and Nuclear Fuel	96	85	92	84	78	78	75	78	94	101	121	128	135	128	112
9 Chemicals and Chemical Products	1 064	978	997	765	797	785	790	838	995	1 024	1 225	1 320	1 423	1 330	1 217
10 Rubber and Plastics	881	887	1 099	1 236	1 285	1 346	1 321	1 362	1 663	2 092	2 449	2 588	2 789	2 640	2 381
11 Other Non-Metallic Mineral	917	881	887	796	613	653	646	671	677	616	651	622	622	536	430
12 Basic Metals and Fabricated Metal	1 297	1 169	1 200	1 037	927	940	911	903	1 072	1 141	1 351	1 414	1 577	1 525	1 326
13 Machinery, Nec	1 044	981	975	755	746	818	911	988	1 293	1 428	1 653	1 819	2 343	2 409	1 951
14 Electrical and Optical Equipment	1 887	1 670	1 699	1 809	1 817	2 073	1 971	2 194	2 923	3 341	4 079	4 398	5 031	5 104	4 566
15 Transport Equipment	322	314	349	283	298	312	302	308	386	391	478	580	727	737	629
16 Manufacturing, Nec; Recycling	3 385	3 364	3 019	4 179	4 169	4 507	4 074	4 423	4 215	4 989	4 980	4 382	4 590	4 138	3 788
17 Electricity, Gas and Water Supply	292	258	281	243	259	284	280	307	378	426	497	545	578	529	461
18 Construction	169	131	128	134	147	177	179	199	175	151	157	173	191	201	151
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	1 002	943	1 070	1 021	991	1 069	1 057	1 199	1 296	1 320	1 470	1 535	1 520	1 454	1 275
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	2 695	2 537	4 627	4 341	4 220	4 772	4 735	5 515	6 108	6 569	5 080	5 230	6 621	6 162	5 162
22 Hotels and Restaurants	879	919	783	690	625	645	623	705	817	978	1 224	1 462	1 538	1 535	1 479
23 Inland Transport	1 208	1 146	1 175	1 117	1 064	1 148	1 138	1 292	1 515	1 648	1 930	2 053	2 113	2 048	1 790
24 Water Transport	218	178	167	180	180	195	191	220	264	276	303	314	313	293	265
25 Air Transport	87	80	77	83	75	85	90	105	120	160	200	212	214	238	201
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	176	168	171	146	120	108	87	80	120	133	128	147	138	124	103
27 Post and Telecommunications	351	332	341	306	284	305	297	329	347	374	442	502	523	497	427
28 Financial Intermediation	295	259	257	253	261	269	282	319	362	389	461	508	521	502	444
29 Real Estate Activities	35	28	26	23	21	21	22	27	34	37	46	56	62	60	51
30 Renting of M&Eq and Other Business Activities	198	172	194	181	173	172	171	190	244	279	347	393	404	397	360
31 Public Admin and Defence; Compulsory Social Security	27	14	7	7	9	11	12	16	21	22	29	36	36	37	35
32 Education	137	129	157	135	115	97	95	106	127	140	179	211	200	206	198
33 Health and Social Work	26	20	20	28	31	34	40	43	60	72	100	123	135	138	129
34 Other Community, Social and Personal Services	4 485	3 962	4 329	4 372	4 327	5 222	6 105	8 376	7 976	7 560	7 407	7 431	6 983	6 776	5 996

Source: WIOD, November 2013 Release.

Annex Table A10. Evolution of Implied Employment from Exports in Indonesia, by Industry

	Number of persons engaged (thousands)															
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
All industry	3 612	3 615	3 763	6 862	5 455	6 482	6 493	5 435	4 929	4 721	5 110	4 469	4 503	4 286	4 094	
1 Agriculture, Hunting, Forestry and Fishing	1 465	1 494	1 518	2 735	1 743	2 280	2 209	1 862	1 675	1 514	1 582	1 351	1 295	1 122	1 015	
2 Mining and Quarrying	11	24	20	51	59	57	45	37	34	34	24	22	24	24	24	
3 Food, Beverages and Tobacco	222	202	207	304	191	242	216	163	114	98	100	84	85	77	65	
4 Textiles and Textile Products	334	327	336	598	591	694	764	638	667	702	810	751	758	705	654	
5 Leather, Leather and Footwear	266	225	199	352	291	324	338	239	222	252	245	238	269	217	255	
6 Wood and Products of Wood and Cork	93	105	128	174	234	278	308	277	234	206	215	171	166	144	115	
7 Pulp, Paper, Paper, Printing and Publishing	7	7	8	13	14	13	14	13	13	14	14	13	14	13	14	
8 Coke, Refined Petroleum and Nuclear Fuel	5	5	7	11	10	12	14	13	9	8	8	7	8	8	6	
9 Chemicals and Chemical Products	17	15	17	28	31	34	34	29	26	21	21	19	19	17	18	
10 Rubber and Plastics	82	77	82	90	88	92	101	91	93	78	98	78	75	74	67	
11 Other Non-Metallic Mineral	35	30	35	71	50	56	52	44	34	29	36	27	22	26	23	
12 Basic Metals and Fabricated Metal	12	10	10	23	25	25	29	27	25	18	19	13	12	11	14	
13 Machinery, Nec	14	16	17	69	80	74	56	51	44	28	25	24	29	28	42	
14 Electrical and Optical Equipment	22	22	24	69	74	66	78	82	70	56	88	68	67	60	48	
15 Transport Equipment	12	12	14	23	19	15	11	11	14	14	20	20	30	29	24	
16 Manufacturing, Nec; Recycling	198	183	176	441	517	518	533	470	370	365	424	237	218	243	206	
17 Electricity, Gas and Water Supply	9	9	14	17	17	20	20	15	11	16	13	13	9	9	10	
18 Construction	13	12	14	15	19	16	20	22	23	17	14	14	14	14	13	
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	281	300	328	669	537	630	582	474	412	385	376	346	317	291	345	
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	168	180	197	402	322	378	348	285	263	273	329	307	279	268	263	
22 Hotels and Restaurants	36	44	45	87	68	92	91	76	73	87	101	136	234	247	280	
23 Inland Transport	105	117	130	232	182	221	226	196	191	198	206	180	183	179	170	
24 Water Transport	27	20	21	38	28	29	28	25	24	23	20	22	22	25	35	
25 Air Transport	4	3	4	6	4	4	7	8	9	12	17	15	15	15	13	
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	18	21	25	44	41	55	39	31	28	28	28	24	25	28	27	
27 Post and Telecommunications	4	5	7	13	12	18	24	23	25	29	34	30	29	29	26	
28 Financial Intermediation	22	23	25	38	29	41	49	28	28	19	16	17	17	22	18	
29 Real Estate Activities	1	1	1	2	2	4	18	21	31	28	35	33	30	30	25	
30 Renting of M&Eq and Other Business Activities	7	10	13	23	24	44	27	9	11	2	1	3	2	1	0	
31 Public Admin and Defence; Compulsory Social Security	13	15	19	49	29	27	35	28	26	33	39	36	32	34	26	
32 Education	25	26	30	56	32	18	31	35	38	49	64	62	62	59	50	
33 Health and Social Work	6	6	6	9	6	5	7	6	6	9	12	10	11	11	8	
34 Other Community, Social and Personal Services	77	70	86	109	87	98	140	108	89	81	77	98	131	225	194	

Source: WIOD, November 2013 Release.

Annex Table A11. Evolution of Implied Employment from Exports in Japan, by Industry

	Number of persons engaged (thousands)														
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All industry	1 806	1 899	2 107	2 345	2 202	2 174	2 161	2 309	2 341	2 298	2 343	2 580	2 678	2 593	1 743
1 Agriculture, Hunting, Forestry and Fishing	5	6	6	6	6	6	7	7	8	8	8	9	10	9	8
2 Mining and Quarrying	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3 Food, Beverages and Tobacco	16	17	21	20	17	17	19	20	21	22	23	26	29	27	22
4 Textiles and Textile Products	22	25	25	26	23	22	24	25	26	28	26	28	28	29	22
5 Leather, Leather and Footwear	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
6 Wood and Products of Wood and Cork	8	8	9	10	10	9	9	9	9	8	8	9	9	9	6
7 Pulp, Paper, Paper, Printing and Publishing	36	35	40	42	39	39	38	39	39	37	37	41	42	42	32
8 Coke, Refined Petroleum and Nuclear Fuel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 Chemicals and Chemical Products	26	26	30	32	31	32	32	33	33	32	32	35	35	30	27
10 Rubber and Plastics	60	61	68	75	74	77	78	81	81	77	78	86	89	84	56
11 Other Non-Metallic Mineral	17	17	19	21	19	20	20	19	19	18	19	20	20	20	11
12 Basic Metals and Fabricated Metal	132	130	143	155	148	143	143	151	153	149	154	164	164	165	109
13 Machinery, Nec	232	245	233	263	261	273	243	250	259	233	232	244	219	252	135
14 Electrical and Optical Equipment	352	356	384	418	392	383	377	392	368	344	337	348	353	320	230
15 Transport Equipment	222	227	268	339	325	286	304	357	356	358	381	440	481	434	267
16 Manufacturing, Nec; Recycling	22	23	27	31	34	27	26	28	23	23	28	29	30	26	19
17 Electricity, Gas and Water Supply	12	13	15	16	15	16	16	17	17	17	17	19	19	17	15
18 Construction	14	15	17	19	17	18	18	20	21	21	21	23	25	26	19
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	10	11	13	15	14	14	14	16	17	18	17	18	19	20	13
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	134	162	184	207	191	183	173	178	193	188	197	220	236	213	154
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	38	47	53	56	48	52	55	58	64	67	68	79	88	80	53
22 Hotels and Restaurants	74	96	112	120	105	105	109	118	130	135	134	140	150	154	100
23 Inland Transport	66	73	80	90	85	86	83	89	96	99	99	114	117	123	87
24 Water Transport	26	32	31	28	27	27	26	26	25	24	21	22	23	21	17
25 Air Transport	3	4	4	6	5	6	6	6	6	5	5	4	4	4	2
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	18	19	21	23	21	22	21	22	23	23	23	25	27	27	19
27 Post and Telecommunications	11	12	13	14	13	14	14	14	14	13	13	15	16	17	12
28 Financial Intermediation	52	56	59	65	59	58	57	60	57	55	57	64	68	60	41
29 Real Estate Activities	5	4	5	6	5	5	5	5	5	4	5	5	6	6	4
30 Renting of M&Eq and Other Business Activities	109	115	139	157	142	156	167	183	194	202	215	255	269	275	181
31 Public Admin and Defence; Compulsory Social Security	5	6	7	8	7	8	8	8	9	8	9	10	10	11	8
32 Education	2	2	2	2	2	2	3	3	3	3	3	4	4	4	3
33 Health and Social Work	4	4	5	6	5	6	6	6	7	7	7	8	9	9	7
34 Other Community, Social and Personal Services	72	46	67	65	56	54	56	62	62	62	64	68	72	74	58

Source: WIOD, November 2013 Release.

Annex Table A12. Evolution of Implied Employment from Exports in Korea, by Industry

	Number of persons engaged (thousands)														
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All industry	1 600	1 579	1 728	2 312	2 014	2 135	2 133	2 048	2 137	2 162	1 878	1 821	1 818	2 069	2 156
1 Agriculture, Hunting, Forestry and Fishing	144	133	150	244	185	168	158	142	142	133	118	107	108	123	153
2 Mining and Quarrying	2	0	0	3	2	0	2	2	2	1	1	1	1	1	3
3 Food, Beverages and Tobacco	22	23	26	28	28	27	24	25	26	27	23	21	22	26	28
4 Textiles and Textile Products	217	176	172	205	194	204	193	167	158	141	95	69	62	61	57
5 Leather, Leather and Footwear	40	30	27	23	25	27	21	15	13	11	8	6	5	6	5
6 Wood and Products of Wood and Cork	4	4	4	4	4	5	4	5	5	5	4	4	4	4	5
7 Pulp, Paper, Paper, Printing and Publishing	18	19	19	22	25	24	25	24	25	25	20	19	18	22	21
8 Coke, Refined Petroleum and Nuclear Fuel	4	4	5	7	7	7	7	7	7	7	7	6	6	6	7
9 Chemicals and Chemical Products	31	30	32	40	32	30	29	29	29	26	21	21	19	20	21
10 Rubber and Plastics	31	32	33	38	35	42	46	49	56	63	58	56	54	60	65
11 Other Non-Metallic Mineral	12	11	11	11	11	14	12	13	12	13	11	11	10	11	12
12 Basic Metals and Fabricated Metal	53	51	49	50	59	70	80	77	75	74	74	71	73	82	92
13 Machinery, Nec	110	114	113	162	123	134	135	134	153	145	129	123	135	168	169
14 Electrical and Optical Equipment	183	176	177	205	217	215	259	255	273	253	227	227	201	208	216
15 Transport Equipment	145	177	209	277	173	220	204	201	219	260	222	225	228	264	278
16 Manufacturing, Nec; Recycling	35	31	35	41	35	41	45	38	45	39	29	28	24	25	28
17 Electricity, Gas and Water Supply	5	5	5	6	5	5	5	4	6	6	5	6	6	7	8
18 Construction	7	7	8	11	8	8	7	6	6	6	5	5	5	6	6
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	8	6	6	7	5	4	4	4	5	5	5	5	5	6	6
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	141	142	153	209	188	184	188	185	189	188	167	162	155	173	182
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	68	81	107	167	153	164	152	139	141	145	122	119	123	146	142
22 Hotels and Restaurants	55	69	95	141	133	156	140	131	135	146	125	122	126	150	145
23 Inland Transport	28	27	29	41	37	35	38	39	40	41	39	39	38	45	48
24 Water Transport	43	36	44	67	62	51	50	50	53	59	58	54	63	72	78
25 Air Transport	21	22	25	34	30	31	30	30	28	30	26	25	25	24	23
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	15	14	16	20	18	17	18	22	22	26	22	23	23	26	28
27 Post and Telecommunications	7	6	7	10	9	11	11	11	13	13	12	13	12	14	15
28 Financial Intermediation	54	50	52	74	57	56	52	45	46	45	37	39	40	48	48
29 Real Estate Activities	7	6	7	10	11	10	9	9	10	11	10	10	10	12	12
30 Renting of M&Eq and Other Business Activities	55	61	72	98	90	111	126	134	148	162	146	154	164	189	194
31 Public Admin and Defence; Compulsory Social Security	12	11	12	19	21	19	15	14	14	11	10	10	10	13	11
32 Education	2	2	2	4	4	5	4	4	4	4	3	3	3	3	4
33 Health and Social Work	1	1	1	2	1	2	2	2	2	2	2	2	3	3	3
34 Other Community, Social and Personal Services	22	20	24	32	28	36	36	34	34	39	36	36	39	46	45

Source: WIOD, November 2013 Release.

Annex Table A13. Implied Employment from Final Demand, by Country

In %

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China															
Total final demand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Domestic final demand	83.7	85.7	84.9	85.6	86.3	85.0	85.4	83.9	81.8	80.2	78.1	76.7	76.6	78.3	81.7
Foreign final demand	16.3	14.3	15.1	14.3	13.7	15.0	14.6	16.1	18.1	19.8	21.8	23.2	23.3	21.6	18.2
United States	3.8	3.3	3.7	4.0	3.8	4.1	3.9	4.3	4.7	5.3	6.0	6.1	5.7	4.9	4.2
Japan	3.2	2.7	2.6	2.2	2.3	2.3	2.2	2.0	2.3	2.5	2.6	2.5	2.1	1.8	1.7
Rest of the world	9.3	8.2	8.8	8.1	7.7	8.6	8.5	9.7	11.1	12.0	13.3	14.6	15.5	14.9	12.3
Germany	1.0	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.9	1.0	1.1	1.2	1.1	1.0
Indonesia															
Total final demand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Domestic final demand	87.0	87.5	87.0	78.4	83.8	81.1	81.0	83.1	83.3	82.6	82.0	83.7	83.9	83.8	86.2
Foreign final demand	13.0	12.5	13.0	21.6	16.2	18.9	19.0	16.9	16.7	17.4	18.0	16.3	16.1	16.2	13.8
United States	2.3	2.2	2.6	4.8	3.8	4.3	4.4	3.7	3.3	3.2	3.4	2.9	2.5	2.2	1.8
Japan	3.4	3.0	3.1	4.2	3.1	3.4	3.3	2.6	2.3	2.3	2.2	1.8	1.5	1.5	1.2
China	0.9	0.7	0.7	1.3	0.9	1.2	1.3	1.2	1.2	1.2	1.3	1.2	1.2	1.3	1.2
Rest of the world	6.5	6.6	6.6	11.3	8.4	9.9	10.0	9.4	10.0	10.7	11.1	10.4	10.8	11.3	9.5
Germany	1.0	0.9	0.9	1.6	1.1	1.3	1.2	1.0	1.0	1.0	1.0	0.9	0.9	1.0	0.8
Japan															
Total final demand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Domestic final demand	91.6	91.1	90.2	90.2	90.6	90.3	90.4	89.7	89.4	88.6	88.3	87.2	86.3	86.4	89.5
Foreign final demand	8.4	8.8	9.7	9.8	9.3	9.7	9.6	10.2	10.5	11.3	11.6	12.7	13.6	13.5	10.4
United States	2.1	2.1	2.6	2.8	2.7	2.8	2.8	2.9	2.6	2.6	2.7	2.9	2.7	2.4	1.7
China	0.5	0.5	0.6	0.6	0.7	0.7	0.9	1.1	1.3	1.4	1.4	1.6	1.8	1.9	1.8
Rest of the world	5.8	6.2	6.6	6.3	5.9	6.2	5.9	6.2	6.6	7.3	7.5	8.1	9.0	9.1	6.8
Germany	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.5	0.4
Korea															
Total final demand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Domestic final demand	79.5	80.3	78.5	71.7	76.3	76.5	77.2	79.0	78.1	76.2	77.5	77.8	76.9	74.3	73.9
Foreign final demand	20.5	19.7	21.5	28.3	23.7	23.5	22.8	21.0	21.9	23.8	22.5	22.2	23.1	25.7	26.1
United States	4.5	4.0	4.4	5.9	5.4	5.4	5.5	5.0	4.9	5.2	4.3	3.9	3.6	3.4	3.3
Japan	3.5	3.3	3.2	3.9	3.3	3.0	2.8	2.2	2.3	2.3	2.1	2.0	1.9	1.6	1.5
China	1.4	1.5	1.7	2.3	1.9	2.1	2.4	2.5	3.0	3.3	3.1	3.1	3.2	3.6	4.5
Rest of the world	11.1	11.0	12.2	16.2	13.1	12.9	12.1	11.2	11.7	13.1	13.0	13.3	14.5	17.1	16.8
Germany	1.0	0.9	0.8	1.1	1.0	1.0	0.8	0.6	0.9	0.9	1.0	1.2	1.0	1.2	1.1

Note: The percentages refer to shares of implied total employment from domestic and foreign final demand. Total final demand is the total final demand of each country.

Source: WIOD, November 2013 Release.

Annex Table A14. Evolution of Implied Employment from Exports in China and Indonesia, by Industry: Robustness Check

	China (All industry = 100%)					Indonesia (All industry = 100%)				
	1995	2000	2005	2008	2009	1995	2000	2005	2008	2009
All industry	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1 Agriculture, Hunting, Forestry and Fishing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 Mining and Quarrying	3.7	2.1	2.2	2.3	2.2	0.5	1.4	0.7	0.8	0.8
3 Food, Beverages and Tobacco	3.4	3.1	3.1	2.7	2.8	10.4	5.8	2.8	2.4	2.1
4 Textiles and Textile Products	17.8	14.5	16.0	15.5	16.0	15.5	16.5	23.0	22.3	21.3
5 Leather, Leather and Footwear	2.8	4.1	5.2	4.9	5.0	12.4	7.7	6.9	6.9	8.3
6 Wood and Products of Wood and Cork	1.7	1.6	2.1	2.5	2.3	4.3	6.6	6.1	4.6	3.7
7 Pulp, Paper, Paper, Printing and Publishing	1.6	1.8	2.4	2.8	2.8	0.3	0.3	0.4	0.4	0.5
8 Coke, Refined Petroleum and Nuclear Fuel	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2
9 Chemicals and Chemical Products	3.2	2.2	2.3	2.3	2.4	0.8	0.8	0.6	0.5	0.6
10 Rubber and Plastics	2.6	3.8	4.6	4.6	4.7	3.8	2.2	2.8	2.4	2.2
11 Other Non-Metallic Mineral	2.7	1.8	1.2	0.9	0.8	1.6	1.3	1.0	0.8	0.8
12 Basic Metals and Fabricated Metal	3.9	2.6	2.5	2.7	2.6	0.6	0.6	0.5	0.3	0.5
13 Machinery, Nec	3.1	2.3	3.1	4.2	3.8	0.7	1.8	0.7	0.9	1.4
14 Electrical and Optical Equipment	5.6	5.8	7.6	8.9	9.0	1.0	1.6	2.5	1.9	1.6
15 Transport Equipment	1.0	0.9	0.9	1.3	1.2	0.6	0.3	0.6	0.9	0.8
16 Manufacturing, Nec; Recycling	10.1	12.6	9.3	7.2	7.5	9.2	12.3	12.0	7.7	6.7
17 Electricity, Gas and Water Supply	0.9	0.8	0.9	0.9	0.9	0.4	0.5	0.4	0.3	0.3
18 Construction	0.5	0.5	0.3	0.4	0.3	0.6	0.4	0.4	0.4	0.4
19 Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	3.0	3.0	2.7	2.5	2.5	13.1	15.0	10.7	9.2	11.2
21 Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods	8.0	13.3	9.5	10.8	10.2	7.8	9.0	9.3	8.5	8.5
22 Hotels and Restaurants	2.6	1.8	2.3	2.7	2.9	1.7	2.2	2.9	7.8	9.1
23 Inland Transport	3.6	3.2	3.6	3.6	3.5	4.9	5.3	5.8	5.7	5.5
24 Water Transport	0.6	0.5	0.6	0.5	0.5	1.3	0.7	0.6	0.8	1.2
25 Air Transport	0.3	0.2	0.4	0.4	0.4	0.2	0.1	0.5	0.5	0.4
26 Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	0.5	0.3	0.2	0.2	0.2	0.8	1.3	0.8	0.9	0.9
27 Post and Telecommunications	1.0	0.8	0.8	0.9	0.8	0.2	0.4	1.0	0.9	0.8
28 Financial Intermediation	0.9	0.7	0.9	0.9	0.9	1.0	1.0	0.4	0.7	0.6
29 Real Estate Activities	0.1	0.1	0.1	0.1	0.1	0.0	0.1	1.0	0.9	0.8
30 Renting of M&Eq and Other Business Activities	0.6	0.5	0.6	0.7	0.7	0.3	1.0	0.0	0.0	0.0
31 Public Admin and Defence; Compulsory Social Security	0.1	0.0	0.1	0.1	0.1	0.6	0.6	1.1	1.1	0.9
32 Education	0.4	0.3	0.3	0.4	0.4	1.2	0.4	1.8	1.9	1.6
33 Health and Social Work	0.1	0.1	0.2	0.2	0.3	0.3	0.1	0.4	0.4	0.3
34 Other Community, Social and Personal Services	13.4	14.6	13.8	11.8	11.8	3.6	2.3	2.2	7.1	6.3
Manufacturing (3-16)	59.8	57.1	60.5	60.7	61.3	61.5	58.2	60.2	52.2	50.4
Non-manufacturing (1-2, 17-34)	40.2	42.9	39.5	39.3	38.7	38.5	41.8	39.8	47.8	49.6

Note: This table replicates implied employment from exports in China and Indonesia in Tables 4 and 5, assuming that all workers in Agriculture, Hunting, Forestry and Fishing engage in non-market economy activities (i.e., with employment of this sector zero out).

Source: WIOD, November 2013 Release.