

# An Empirical Overview of Philippine Trade\*

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## Abstract

This paper is linked to the dataset that the author has collected, merged and cleaned in the Philippines with the help of the Philippine Statistical Authority (PSA). In this paper the construction of the dataset is briefly discussed, after which an overview of the Philippine economy is given using the new dataset. The focus is mainly on the dynamics in concentration, prices and composition of trade in the Philippines in terms of exports, although the imports will also be discussed. This paper ends with a special focus on the top hundred products that the Philippines exports over the sample. These top products summarize Philippine trade in a comprehensible way.

**JEL Classification:**

**Keywords:**

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## Contents

<b>1</b>	<b>Introduction</b>	<b>2</b>
<b>2</b>	<b>Data</b>	<b>2</b>
<b>3</b>	<b>Philippine Trade</b>	<b>5</b>
3.1	The Composition . . . . .	5
3.2	Prices . . . . .	9
3.3	Concentration . . . . .	11
<b>4</b>	<b>Top 100 Export Products</b>	<b>14</b>
<b>5</b>	<b>Conclusion</b>	<b>18</b>
<b>A</b>	<b>Product Classification</b>	<b>20</b>
<b>B</b>	<b>Top 10 Exported and Imported Products</b>	<b>21</b>

## List of Figures

1	Philippine Trade . . . . .	2
2	Number of Firms by Sample . . . . .	4
3	Percentage of Total Revenue Accounted for by Sample . . . . .	5
4	Number of Firms by Trade Activity (in 000's) . . . . .	6
5	Percentage of Transactions Accounted for per Product Type . . . . .	7
6	Percentage of Revenue Accounted for per Product Type . . . . .	8
7	Median Value of Transactions Within a Product Type . . . . .	8
8	Intra-Industry . . . . .	9
9	Mean Price Change and Number of Distinct Products Trend for Exports Over Time . . . . .	10
10	Import/Export Mean Price Ratio . . . . .	11
11	Firm Export Concentration Ratio per Product Category . . . . .	12
12	Herfindahl Indexes . . . . .	13
13	Export Concentration . . . . .	14
14	Percentage Firm Yearly Revenue Accounted for Main Product . . . . .	15
15	Average Number of Firms per Year . . . . .	15
16	Number of Distinct Imports Imported by Firm by Main Export Product . . . . .	16
17	Percentage of Total Firm Year Observations in Which the Firm also Imports by UNC-TAD Classification . . . . .	16

## List of Tables

1	Concentration Ratio of Firms per Destination for Top 11 Destinations . . . . .	13
A.1	Product Classification* . . . . .	20
B.1	Top 10 Export Products 1991-2012 in Terms of Revenue . . . . .	21
B.2	Top 10 Import Products 1991-2012 in Terms of Revenue . . . . .	22

# 1 Introduction

The Philippine economy is the 44<sup>th</sup> largest economy in the world according to 2013 World Bank (WB) Gross Domestic Product (GDP) statistics. Over the last 22 years, the Philippines have imported more goods than that they have exported in terms of f.o.b value, showing a current account deficit for almost every year between 1991-2012. (See Figure 1) This trend occurs, at least in part, due to the large influx of remittances to the Philippines. Export value in real terms has remained below its peak in 2000, showing a strong drop in 2009. Behind this general trade trend there are dynamics at work. This paper will give an overview of trade in the Philippines. In the process showing the dynamics in concentration, prices and composition of trade and describing the data.

Figure 1: Philippine Trade



Notes: The figure summarizes total trade in the Philippine. The f.o.b value has been deflated by the consumer price index (CPI) with as base year 2005.

## 2 Data

### Merging and Cleaning the Data

This thesis employs a new dataset that matches the firm surveys and trade transactions records collected by the Philippine Statistics Authority (PSA) over the period 1991 – 2012. The firm survey data comprises eight Annual Survey of Establishments (1997, 1998, 2001, 2003, 2005, 2008, 2009 and 2010) and three Census of Philippine Business and Industry (2000, 2006 and 2012).<sup>3</sup> All the large firms with 200 or more employees (in some years, 100 or more) are surveyed, while the rest are sampled.

The Philippine data used in this thesis has been gathered, combined and cleaned by the author of this thesis with help from the PSA. The data consist of three parts which in turn consist of many cross sections of data. Each part has been merged separately before being merged to the other parts. All the cleaning and merging is programmed in one STATA do-file that uses the background excel files of raw data in the process. Therefore the raw data is never altered and all the steps made by the author can be traced through the respective do-file. This is done in order to ensure consistency and traceability over time.

The first two parts of data are the universe of export and import customs data from 1991-2012. The customs data consist of separate cross sections for each year. The magnitude of the import data is notably larger than that of the export data. There are three corrections made to the trade data. The first correction is that of trader codes over time. The trader codes are unique over time, implying that no two firms can have the same trader code. However, in some cases a firm is given a different trader

<sup>3</sup>The 1997 survey is a combined survey covering both 1996 and 1997.

code over time. Therefore the PSA crosschecked the trader codes for consistency by verifying address, establishment control number, firm name and tax information number. This led to the correction 1,614 firms with usually two and sometimes three trader codes.<sup>4</sup> This cleaning of the data is only done for the firms for which the trade data can be linked to the survey data.<sup>5</sup>

The second correction involves matching the PSCC (Philippine Standard Commodity Classification) 7-digit classification (harmonized to the SITC (Standard International Trade Classification) Rev. 3 until 5 digits) to the PSCC 10-digit classification (harmonized to the HS (Harmonized System) classification) which is used from 2006 onwards. The difficulty in correcting this change in classification is that in some cases multiple 7-digit categories match to a single 10-digit category, clearly indicating that the change in classification is not merely a switch to a more detailed classification. The PSCC 7-digit classification was tailored to the Philippine economy while the 10-digit classification was created in order to harmonize trade statistics between the Association of Southeast Asian Nations (ASEAN) member countries. In order to merge the data over time and insure consistency a 7-digit category that the firm previously exported is taken as the corresponding classification whenever multiple 7-digit categories match to the same 10-digit category. For example 10-digit product category A matches with 7-digit product category B, C and D however firm 1 produced product B the year before then B is assigned to all product from 2006 onwards that are classified A. The number of single PSCC 10-digit categories with multiple 7-digit categories is very limited, however when they are encountered the strategy is applied in order to ensure within firm consistency.<sup>6</sup> The third correction related to the product classification concordance over time is the concordance of unit values over time. If the unit value in which the product is measured changed over time then gross kilos was used in order to ensure consistency over time.

The last part of the data consists of manufacturing firm surveys. The survey data is a lot more complex to merge. The manufacturing surveys change over time comprising of more or fewer questions and different questions over time. The 2001 survey, for example, is the shortest consisting of only 8 pages, while the 2009 survey consist of 12 pages. Also within a year the PSA often had a short questionnaire for smaller firms and a more extensive survey for larger firms. All these differences made merging the manufacturing surveys a tedious process. Before matching the survey over time the questionnaires are compared and corresponding questions over time are given the same code. Therefore questions that appeared in multiple surveys could be traced. Due to changing surveys over time multiple questions only appeared in part of the sample. Also even if a question did appear in multiple years the response to that specific question could be low. Therefore questions with a high response rate that appear in every survey are limited. On top of this the manufacturing surveys have a certainty stratum. Only firms with more than 100 or in some years 200 employees are in this certainty stratum. This implies that firms with fewer employees are subject to sampling. Therefore smaller firms often only appear in one survey. Due to the difference in questionnaires and sampling the panel dimension of the firms' survey data is very limited and mostly revolves around the large firms.

## Sample Choice

The export data, which is used most extensively, is the data discussed in this section. The question which sample one should use in the analysis is always a difficult one. Figure 2 shows that choices can

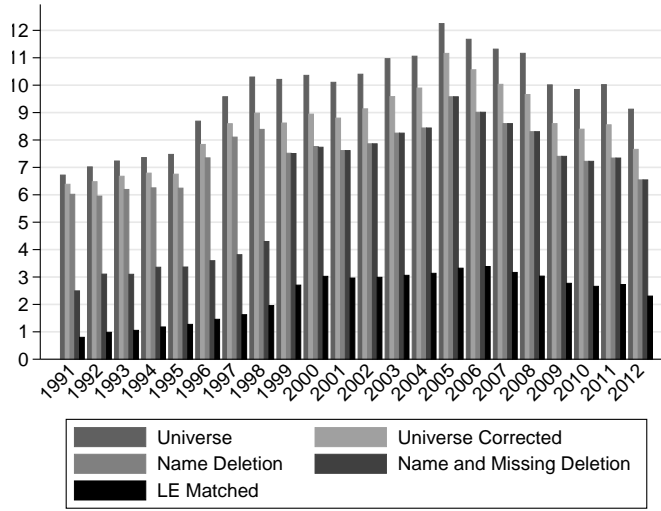
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<sup>4</sup>One example is a firm name written with and without apostrophe that is given a different trader code. These and multiple of other examples confirm the uniqueness of the trader code however endanger the consistency. Therefore corrections are of the utmost importance. There are also a couple of examples of multiple firm branches operating under the same trader code. The firm survey information of the respective branches is then combined to the unique trader code.

<sup>5</sup>Only firms that appear in the manufacturing survey and therefore in the list of establishments, can be linked to the trade data.

<sup>6</sup>There are 401 10-digit products which match in most cases to two (68.1%) up to a maximum of 35 7-digit product categories. Most of the products with this matching problem are also of less importance as the average importance ranking in terms of total revenue of these products is 3135. Indicating that this complication is mostly contained to relatively unimportant products for the Philippine economy. Also only 410 observations in the sample have this multiple matching difficulty.

Figure 2: Number of Firms by Sample



Notes: Source: Author's own calculation

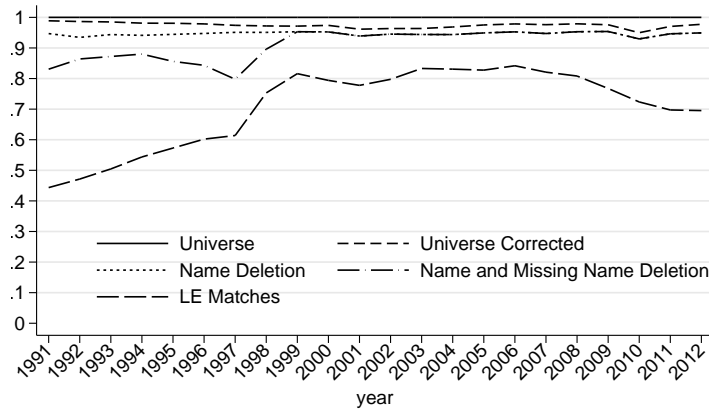
lead to very different export sample sizes. The first sample that can be used is the full sample without any correction.(Universe sample) The disadvantage of this sample is that certain firms and products will be added to the analysis that have little to do with what the Philippine firms actually produce or are hard to link directly to the production of the goods. There are two aspects of the data that can be cleaned in order to make a distinction between firms and products that have little to do with the Philippine production of export products and firms and products that do. Firstly, products that cannot be linked to the Philippine economy can be deleted from the analysis. (Universe Corrected sample) Product categories ‘Good returned to the country whence exported’, ‘other commodities temporarily imported/exported’, ‘personal and household effects of travel’ and ‘replacement of returned good’ are examples of product categories that are excluded in the Universe Corrected sample. These product categories are relatively uninformative and hard to link to the production of the product. The product categories excluded comprise most of the products that form the category 93 in the PSCC classification, with the notable exception of PSCC items 93101 till 93102 which contains products built on consignment basis.

Secondly, firms that are not involved with the production of goods but, for example, only engage in the trade of the good can be excluded. There are two strategies for identifying the firms that are engaged in production (i.e. manufacturing firms). The first option is to use name deletion in order to identify manufacturing firms. (Name deletion sample) This strategy involves deleting firms with certain words within their name.<sup>7</sup> The problem with this strategy is that in the years before 1999 on average 42.9% of the firms have no name in the customs data. If the firms with no name are also deleted from the analysis then the sample in the years before 1999 drastically drops. (Name and Missing Deletion sample) Including the firms with missing names overestimates the number of manufacturing firms while excluding these firms leads to a drastic underestimation of the number of manufacturing firms before 1999. (See Figure 2) The second option is to use the matched firm dataset. These are the traders’ codes that have been matched to the list of establishments (LE) of manufacturing firms from the PSA. This last sample ensures that the respective firms are manufacturing firms. (LE

<sup>7</sup>In practice this involved deleting exporters that had in their name the words importer, exporter, export, import, trading, trader, moving, logistic and shipping. This is a similar strategy as employed in Manova and Zhang (2012). Although not perfect this method nevertheless deletes a large portion of non-manufacturing firms. The author must stress that the do-file that performed this deletion is constructed in such a way that the author does not, at any time, see any firm name. This was done for confidentiality reasons.

matched sample) This sample is corrected for multiple trader codes used by the same firm over time. The list of establishments from 1996 onwards has been used for this matching which is updated by the manufacturing surveys that the PSA performs. Therefore in years in which large manufacturing surveys are held the number of identified manufacturing firms increases. Therefore it will underestimate the number of manufacturing firms although this underestimation is more prominent in the years before 1996. However, once the firm is linked to a trader code the trade activity of the respective firms can be traced throughout the sample.

Figure 3: Percentage of Total Revenue Accounted for by Sample



Notes: Source: Author's own calculation

The sample used can differ when the analysis changes. For this paper, for example, the Name Deletion sample is used. This sample slightly overestimates the number of manufacturing firms before 1999; however this sample comes closest to capturing the whole sample of manufacturing firms over time.<sup>8</sup> In terms of total export revenue the decision of the sample does not seem to matter greatly as even the smallest sample still accounts for a significant part of the total export revenue in most years. (See Figure 3)

### 3 Philippine Trade

#### 3.1 The Composition

A preliminary glimpse of the composition of Philippine trade can be given by the yearly top 10 products, in terms of revenue, that the Philippines export and import over the sample period.<sup>9</sup> The Philippine top 10 exports contain products like shrimps and prawns (frozen), coconut oil, wood carvings and different apparel items. However most of the top 10 consists of electronic products. (e.g. semiconductor devices and digital monolithic integrated units) Electronic products are the most important manufacturing sector of the Philippines in terms of export value. On the import side the top ten consists of transportation (e.g. cars and airplanes), inputs for the electronic and apparel sectors, petroleum and related products and staples (e.g. rice and wheat).

There are 2,532 distinct products, a product being defined as a 7-digit PSCC, exported in 1991; while 3,781 products are exported in 2012. Showing an increasing trend in distinct products exported over time. Of all the products that were exported in 1991 67.1% are still exported in 2012 and they account for 66.7% of the total export value in 2012. For imports 5,987 different products are imported in 1991 while 6,531 different products were imported in 2012, also displaying an increasing trend over

<sup>8</sup>As can be seen in Figure 2 there is no distinction between the Name and Missing Deleted and the Name Deleted sample after 1999.

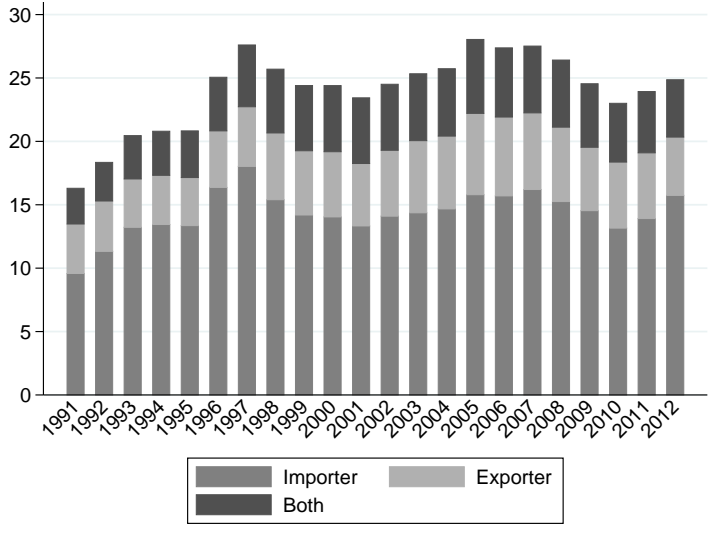
<sup>9</sup>See appendix B.1 and B.2 for lists of top ten exports and imports.

time. Of all the different products that were imported in 1991 78.0% are still imported in 2012 and they account for 78.8% of the total import value in 2012. Trade therefore displays a certain amount of consistency over time, although this consistency is more pronounced for import than export products.

The importance of export and import products in terms of revenue, however, does change over time. Of the top ten export products in terms of total value in 1991 only 3 remain in the top ten in 2012.<sup>10</sup> This is also the case for imports as only 3 remain in the top ten in 2012.<sup>11</sup> Nonetheless there is a certain amount of consistency as 28 (29) products account for the top 10 exports (imports) of the Philippines in terms of yearly export (import) value over a time period of 22 years.<sup>12</sup> Even though the Philippines import a total of 8,981 different products and on average 6,222 different products per year only 310 account for the top 100 products in terms of yearly import value. These products account for 69.1%-82.5% and on average 75.9% of yearly import value. These products however only account for 27.5% of total import transactions. The Philippine firms export a total of 7,209 different products and on average 3,008 different products per year. However only 299 export products account for the top 100 export products in terms of yearly export value. These 299 export products account for 86.4%-94.2% and on average 91.0% of yearly total export revenue. These products also account for 42.3% of total export transactions. Part of this paper will focus on the products that constitute the top 100 over the 22 years of the sample. As these products summarize to a great extent and in a comprehensible way the Philippine economy.

The number of firms engaged in trade display a similar trend as total trade of the Philippines. (See Figure 4) Basically when total trade increases more firms enter and fewer exit and the reverse when total trade decreases. Firms that solely import comprise the largest group in the Philippines, accounting for 59.7% of the total firms that engage in trade. While firms that solely export and firms that both import and export constitute 20.8% and 19.4% of the firms engaged in trade.

Figure 4: Number of Firms by Trade Activity (in 000's)



Therefore firms are more likely to import than export. Of the firms that export a little less than half of these firms also import. There is, however, a magnitude difference between the two. Firms that export and import are notably larger than firms that solely export or import. The median size in

<sup>10</sup>The top ten export products in 1991 rank in decreasing order 3<sup>rd</sup>, 4<sup>th</sup>, 105<sup>th</sup>, 175<sup>th</sup>, 7<sup>th</sup>, 150<sup>th</sup>, 23<sup>rd</sup>, 177<sup>th</sup>, 19<sup>th</sup> and 30<sup>th</sup> in 2012.

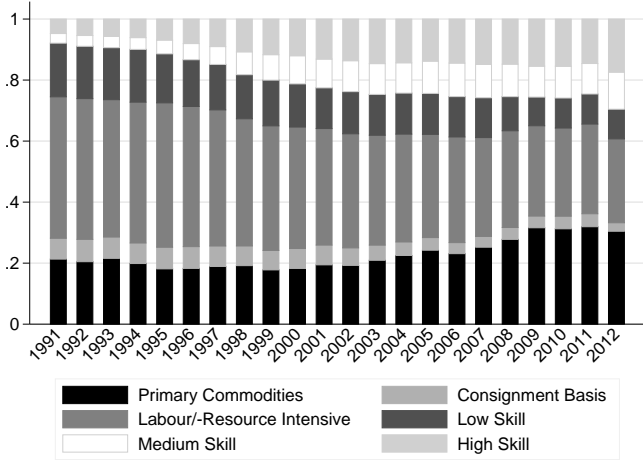
<sup>11</sup>The top ten import products in 1991 rank in decreasing order 1<sup>st</sup>, 2<sup>nd</sup>, 26<sup>th</sup>, 5<sup>th</sup>, 91<sup>st</sup>, 11<sup>th</sup>, 12<sup>th</sup>, 9<sup>th</sup>, “not imported” and 64<sup>th</sup> in 2012.

<sup>12</sup>The top 10 exports (imports) account for at least 39.8%(29.4%) and on average account for 53.8% (43.9%) of total yearly value. (See appendix for list of top 10 exports and imports.)

terms of yearly export revenue for the solely exporting firm is \$21,860 while for firms that both export and import it is \$189,342. The same is true of firms that only import versus firms that do both. The median size in terms of yearly import value for the solely importing firm is \$33,524 while for firms that both export and import it is \$254,043. Clearly displaying that the firms that both import and export dominate Philippine trade. The difference in the median size of import and export value for firms that engage both in import and export indicates that for the medium firm imports are larger than exports.

The products in the Philippines can be divided into six broad categories based on production using a similar classification as the UNCTAD product group classification, however slightly tailored for the Philippines. (See Appendix A.1) The category Consignment Basis is added to the group classification as it is a relatively large group, however does not fit in the other five UNCTAD categories. The UNCTAD classified the Consignment category as unclassified. Given the size of this category for Philippine trade excluding it would be a mistake. The Consignment Basis category consists of export goods that are made from materials on consignment basis. In procurement on a consignment basis, a seller delivers certain materials to a firm that is put in the consignment stock of their business. The consignment stock remains the property of the seller until the firm uses material from the consignment stock, processes and sells (exports) it. Once a firm has used materials, it will have liabilities towards the seller that it needs to pay. The firm and the seller can agree on a time period after which the firm has to transfer unused consignment material to its own stock. Firms that produce on consignment basis often add mostly labor to the production process. This sector is therefore related to the labor intensive sector, however distinctly different due to the fact that the inputs are materials on consignment basis, which is often imported. The products produced on consignment basis mainly consist of apparel, footwear and electronic products (e.g. semi-conductors devices).

Figure 5: Percentage of Transactions Accounted for per Product Type

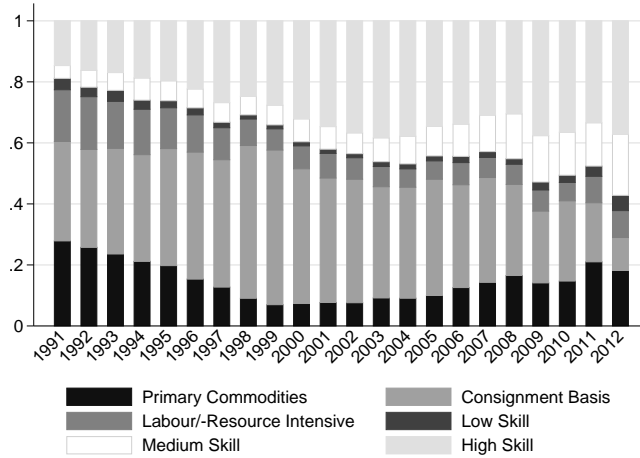


Notes: The figure summarizes the number of transactions per product category. Where a transaction is defined as a firm-product-destination-year observation.

The export in the Philippines is dominated in terms of number of transactions, in decreasing order, by labor-/resource intensive (labor intensive) and primary products. (See Figure 5) Where a transaction is defined as a firm-product-country observation. The percentage of transactions attributed to a category is arithmetically determined by the number of firms, different products and countries exported to. Therefore it is not surprising that primary products dominate the transaction data as the Philippines has many firms and export products within this category. It is, however, the dynamics over time in terms of transactions that are especially insightful. It shows a decreasing trend for labor intensive and consignment based products over time. While high skill/capital/technology intensive product (High skill) and medium skill/capital/technology intensive (Medium skill) products have become of increasing importance. In terms of total export value high skill products have become



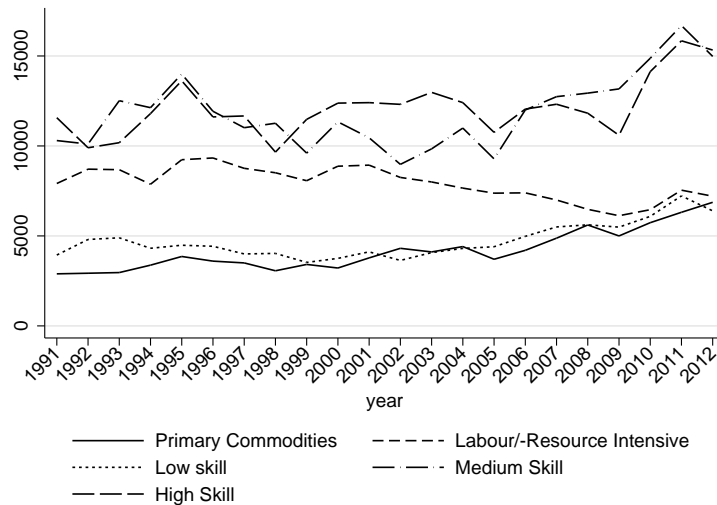
Figure 6: Percentage of Revenue Accounted for per Product Type



Notes: The figure summarizes the percentage of total export revenue per product category.

the most important product category followed by goods produced on consignment basis, primary commodities and medium skill products. (See Figure 6) What is striking to see is that product categories that are of less importance in terms of transactions, medium skill, high skill and consignment based products, dominate the export revenue. However it is important to note that products produced on consignment basis show a clear decreasing trend over time in terms of total revenue.

Figure 7: Median Value of Transactions Within a Product Type



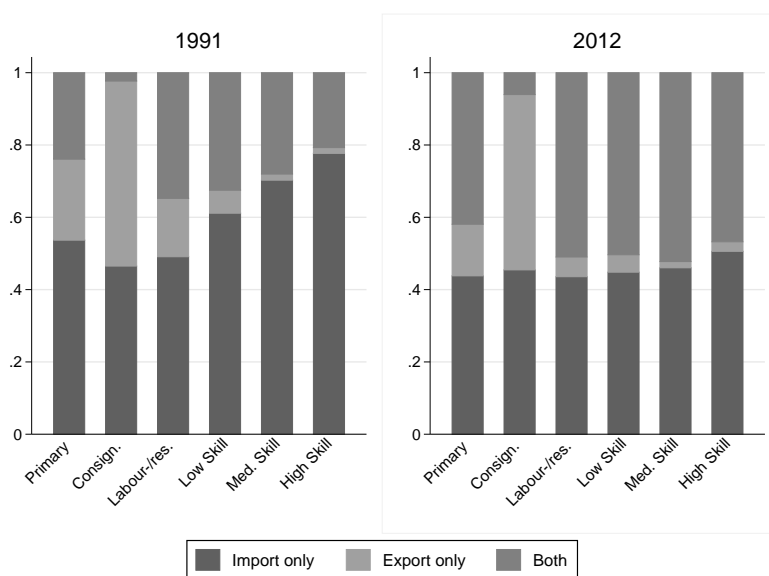
Notes: The figure summarizes the median revenue of an transaction per product category. Where a transaction is defined as a firm-product-destination-year observation.

The median revenue size of a transaction by product type clearly shows that products that are Medium and High skill have the largest transactions. (See Figure 7) The revenue of a transaction is determined by two factors the quantity and price. Primary commodities are often heavier and receive a lower price than medium and high skill products. Where the quantity is measured in gross kilos. One category that is excluded from this figure is the consignment based products. The median revenue size of a transaction for goods produced on consignment basis is the largest and has an average median

transaction revenue of \$ 43,879 and is therefore notably larger than other product categories.<sup>13</sup>

The change in export composition is clearly demonstrated by Figure 8. Over time more products are being both exported and imported by the Philippines instead of only imported. This trend is most clear for high and medium skill products. This figure hints on a skill upgrade in Philippine exports over time. Unfortunately the classification of the export product does not indicate the value that the Philippine firms add to these products. In terms of global production chains the Philippines could be specialized in final assembly. This would imply that even though they export high skill products they mostly add labor to the production process when assembling the products. Therefore it is of importance to see whether the Philippines exporting firm mainly operates in final goods assembly, in which case the increase in exported medium and high skill final goods implies relatively little in terms of firm skill upgrading.

Figure 8: Intra-Industry



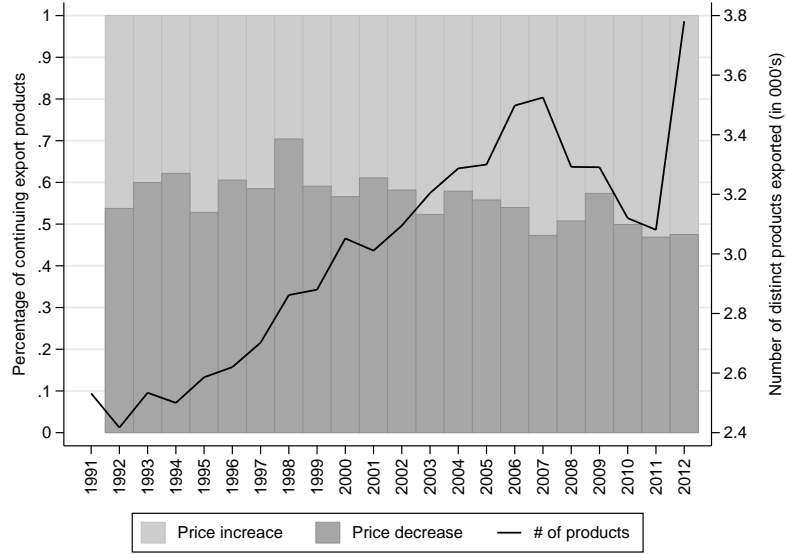
*Notes:* This figure summarizes the percentage of products that are solely imported, exported or both exported and imported in the Philippines. The categories correspond to the revised UNCTAD classification (see appendix). The number of product per classification remains relatively stable. For example in 2012 1,520 products are classified as high skill products while in 1991 it are 1,568. Therefore the absolute number of products per category does not change greatly, however the composition in trade direction does.

### 3.2 Prices

For most distinct products the mean prices are decreasing over time. A minimum of 75.2% and on average 79.1% of the products exported in a certain year were also exported the following year. For these products yearly price trends can be calculated. Figure 9 shows the percentage of continuing products (i.e. products that are exported in consecutive years) that have a mean price that increases or decreases in constant terms. Apart from the years 2007, 2010-2012 the trend has been that the average product gross kilo price decreases for more continuing products than that it increases. The striking aspect is that in recent years this trend is being reversed as an increasing amount of product categories are facing increasing average prices. Figure 9 also shows the number of distinct products exported by the Philippines over time. The Philippines shows a clear increasing trend in the number of distinct products exported over time.

<sup>13</sup>The broader PSCC product classifications that are present in this category contribute to these larger transaction revenues.

Figure 9: Mean Price Change and Number of Distinct Products Trend for Exports Over Time

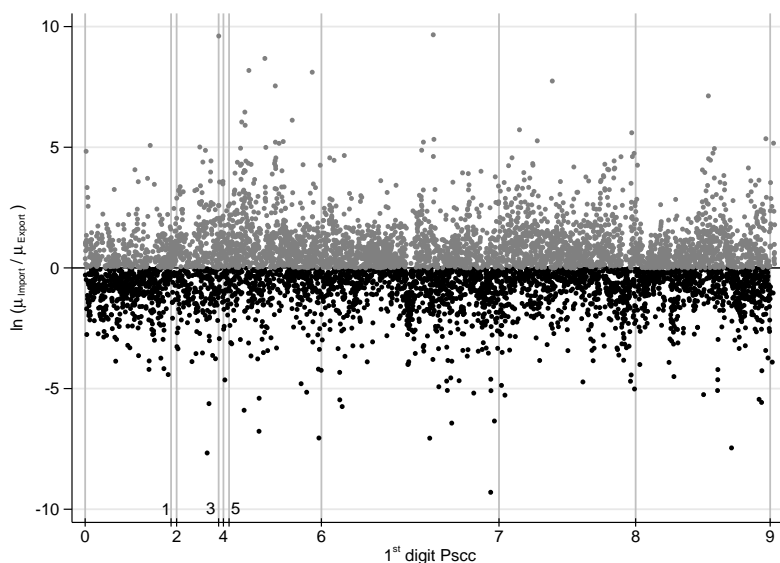


*Notes:* This figure summarizes the mean  $\ln(\text{price})$  change over time. The mean is taken by product for all firm-product-destination prices (transaction level) deflated by the CPI (base year 2005). A price increase indicates that the mean price of the respective product that is exported in both years ( a continuing product) increased. The bars denote the percentage of continuing products of which the mean price increased or decreased over time. The line in the figure indicates the number of distinct products exported in the respective year.

Individual product unit values (prices) contain very little information unless they are put into a context. One way prices can be compared is by comparing export prices to that of import prices for the same distinct product. This places the export prices in an international context in terms of competitors. For 54.8% of the products the mean import price is higher than the mean export price. Indicating that for most export products the Philippine exports product that have a lower average export price that the average import price of the same product. There are however distinct products which do not have any corresponding imports. For these products the prices cannot be compared, which leads to a slight bias. There are for example 16 distinct product in the top 100 export product list that have no corresponding imports.<sup>14</sup> The median deviation between the import and export price for goods of which the import price is higher is \$7.3 per kilo. While the median deviation for goods of which the export price is higher is \$6.1 per kilo. The distribution of deviations shows that a deviation for products where the import price is higher is greater than for products where the export price is higher. Only at the end of the right tail of the deviation distribution do deviations in products of which export prices are higher than import prices become higher than the reverse. This is why in Figure 10 the deviations for goods of which the export price is higher are more often closer to the value zero than when the reverse is true. Indicating that, apart from the fact that the mean import price is often higher than the corresponding mean export price of a product, the differences are also often greater when import prices are higher.

<sup>14</sup>Thirteen of these products comprise of consignment based products exported by the Philippines.

Figure 10: Import/Export Mean Price Ratio



*Notes:* This figure summarizes the ratio of the mean import price and the mean export price over 22 years in constant prices (deflated by the 2005 CPI). The natural logarithm is taken in order to scale the results. Therefore values smaller than zero indicate that the mean export price of a distinct product is higher than the mean import prices. The horizontal axis contains the rank of distinct product from lowest PSCC 7-digit code to highest digit code. The values on the axis indicate the value of the highest digit. Therefore it can be observed that relatively few product are exported from the 1st digit sections 1, 3 and 4. Products that have no corresponding import price are omitted from the graph. In 54.8% of the cases was the mean import price higher than the mean export price of a distinct product.

### 3.3 Concentration

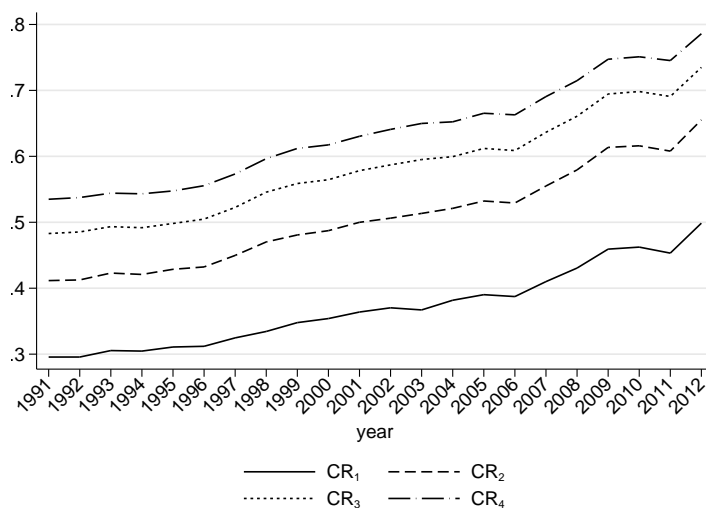
Over time the mean concentration ratio of firms per product category has increased. A smaller number of firms have started to dominate the exports of the Philippines. In 1991 the single largest firm within an average export product accounted for 29.6% of total export sales while in 2012 it was 49.9%. The concentration ratio of the largest firm ( $C_1$ ) therefore shows a clear upward trend. (See Figure 11)

The product firm concentration ratio is dependent on the number of firms that export the respective product. On average 30.9% of the distinct export products only have one firm exporting it in a respective year.<sup>15</sup> The percentage is relatively stable over time and achieves its maximum in 1993 (34.8%) and its minimum in 2000 (28.2%). In 58.9% of the distinct export products there are 4 or less firms that export the product in a respective year. This partly explains why the product concentration ratio is high as there are many products that are exported by relatively few firms. The lowest firm concentration ratio of 3.2% is obtained in one of the largest export sectors in terms of firms, furniture of rattan (8217903). When a large number of firms export a certain product the concentration ratio also tends to be lower. The firm concentration ratio for an distinct export product with a 100 or more firms exporting it in a certain year has a median  $C_1$  of 14.4%; while distinct products with 5-10 firms exporting it have a median  $C_1$  of 64.4%.

These concentration statistics partially explain why there are many short durations in trade product spells found in the trade literature survival (e.g. Besedes and Pursa (2006)); as many products are exported by notoriously few firms and therefore more likely to have shorter spells. Product categories that have only one firm in it per year over the whole period that it is exported have an average spell duration of 1.3 years after discarding left censored spells. While product categories with, on average, more than 1 firm and up to an average of 2 firms in it per year have an average (median) duration of 2.9 (2). The average and median duration rise as the average number of firms within a specific product

<sup>15</sup>On average 12.5% and 9.4% of the distinct export products only have 2 and 3 firms exporting the product in a respective year.

Figure 11: Firm Export Concentration Ratio per Product Category



Notes: This figure summarizes the average firm concentration ratio per export product category.

rise.<sup>16</sup> The 299 products that constitute the top 100 export products in terms of value have product spells of 12.4 years while products that never enter the top 100 have average product spells durations of 3.7 years if left censored observations are not discarded. If left censored observations are discarded then 54.1% of the spells of the top 100 export products remain and the average duration drops to 7.3; while for other products the duration drops to 2.6 years and 14.3% of the spells are discarded. The difficulty of the comparison of non-left censored spells is that many of the main export products are left censored and therefore only new main products are compared. Nonetheless the duration spells of the top 100 products are longer more importantly it are these products that constitute the export of the Philippines.

After corrections there are 269 destinations to which the Philippines exports.<sup>17</sup> There are 156 destinations to which, at least in one year, only 1 Philippine firm exports.<sup>18</sup> There are 188 destinations to which, at least in one period, 4 or less firms exported to.<sup>19</sup> To these 188 destinations the Philippines exports on average 12.9 years. Of the periods that the Philippines export to these destinations there are, on average, 4 or less firms exporting to the respective destination in 65.6% of the years. The 188 destinations consist mainly of small (island) economies and relatively poor countries and account only for 0.9% of total export value. There are 81 destinations which can be considered important destinations in terms of the number of firms that export to it. The top 10 destinations, however, dominate the exports as they account for 83.5% of total export revenue.<sup>20</sup>

Even within the main destinations a relatively small number of firms account for the majority of export revenue per year. The concentration ratios for the largest export markets, USA and Japan, are the lowest. However even then the largest Philippine firm account for respectively 9.7% and 10.9% of total export revenue in a respective year.

The Herfindahl index, which is the sum of the squared market ratios, is an indicator of concentration. If the Philippines would only export to 1 destination then the destination Herfindahl index

<sup>16</sup>Product categories with on average (2-3] firms in it have an average (median) spell length of 4.8 (3), with (3-4] firms it is 6.9 (5.5), with (4-5] firms it is 8.6 (8) and for products with 5 or more firms it is 10.7 (12) years.

<sup>17</sup>Observations without a corresponding destination name are deleted.

<sup>18</sup>There are 25 destinations to which, over the whole period, only 1 firm exports per year.

<sup>19</sup>There are 68 destinations to which over the whole period 4 or less firms export to per year.

<sup>20</sup>These calculations are made without adding the destinations Alaska, Hawaii and other smaller islands belonging to the USA (e.g. Guam and Puerto Rico) to the USA, Okinawa to Japan and the Sabah and Sarawak districts to Malaysia. As they are denoted as separate destinations in the data.

Table 1: Concentration Ratio of Firms per Destination for Top 11 Destinations

Classification	$C_1$	$C_2$	$C_3$	$C_4$
USA	9.7	16.2	20.1	23.2
JPN	10.9	17.5	22.4	26.4
NLD	38.8	53.6	61.1	66.2
HKG	20.1	31.1	37.8	42.5
SGP	24.5	36.4	44.3	50.0
CHN	30.7	45.4	53.1	58.4
TWN	27.4	38.4	45.8	51.6
MYS	34.9	50.5	58.1	62.5
DEU	25.2	41.3	50.7	57.0
KOR	23.3	34.4	40.5	45.2
THA	30.6	40.8	47.5	52.5

*Notes:* This figure summarizes the yearly average firm concentration ratio per export destination. Therefore if the lead firm changes then the concentration ratio of that respective firms is taken to calculate  $C_1$ . The countries in this list are the main destinations for Philippine exports. These concentration ratios are averages over the whole time period. The top 11 firms account for 86.7% of total exports.

would obtain a maximum value of 1. The more concentrated the exports of the Philippines are in terms of destinations the higher the value of the destination Herfindahl index will be. The Herfindahl index is calculated for destinations, products and firms. What can be seen is that the concentration of export destinations has decreased over time. (See Figure 12) This is mainly due to the decrease in the importance of the USA as export market over time. For products the importance of semi-conductors basically drives the product Herfindahl index. On average 19.6% of total export value is accounted for by semi-conductors, in 1999 it accounted for a maximum percentage of 38.0% of total export value. After 1999 the importance of semi-conductors slowly decreases to a minimum of 3.6% of total export value in 2012. The firm concentration is closely related to the product concentration ratio.

Figure 12: Herfindahl Indexes

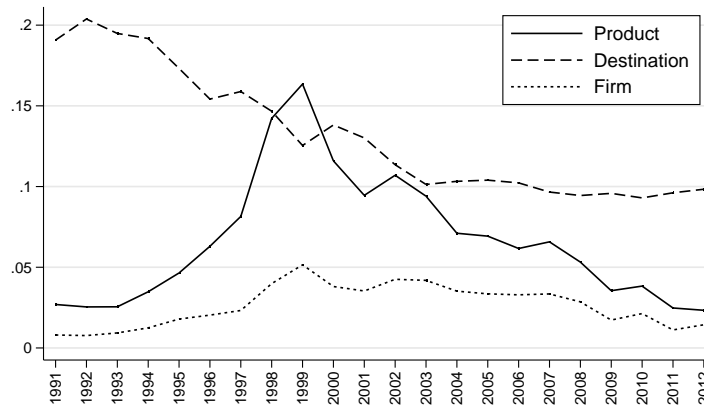
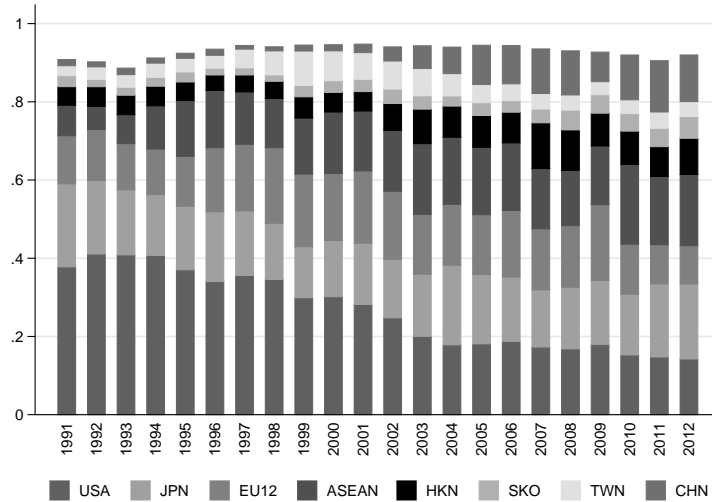


Figure 13 shows the export revenue accounted for by destination. These destinations account for, on average, 92.9% of total exports. The figure clearly shows the decreasing importance of the USA and EU12 and the increase of importance of regional trade partners mainly China and countries that are part of ASEAN.<sup>21</sup>

<sup>21</sup>The results of ASEAN are mainly driven by Thailand and Singapore.

Figure 13: Export Concentration



*Notes:* This figure summarizes the percentage of total revenue accounted for by destination. For these calculation destinations are combined. For the USA the states Alaska and Hawaii, Japan the island Okinawa and Malaysia the districts Sabah and Sarawak are added. ASEAN consist of Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Singapore, Thailand and Vietnam. The EU12 consist of Belgium, Germany, Denmark, France, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and the UK.

## 4 Top 100 Export Products

This part of the paper focuses on the 299 export products that constitute the top 100 export products in the sample. One of the questions that arises when the number of high and medium skill goods export increases is the value that these Philippine firms add to these products. It is therefore insightful to link the imports to the exports in order to unravel the import content of the exports. The imports and exports of a firm are linked through a unique trader code that each firm has. Firms are classified on basis of main export product, in terms of value, that a firm exports in a respective year. For this part of the paper only firms that export a main product that is in the top 100 list will be included in the analysis. By focusing on the main export product not too much information is lost. For the firms that produce a main export product that is in the top 100 list the main export product for the median firm accounts for 86.8% of total yearly export revenue. (See figure 14) <sup>22</sup>

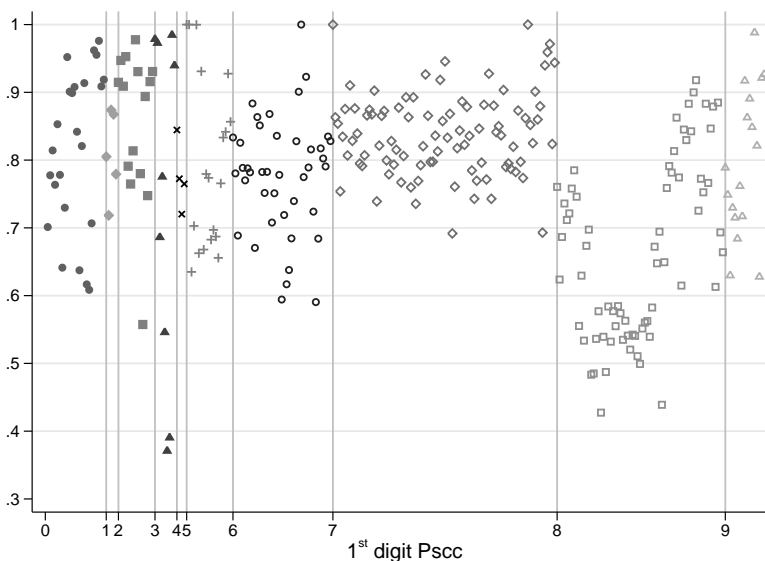
The number of firms that export a certain main product per year is on average 12.8 firms. The median however is 4 firms per year per main export product. There are a couple of main export products that have a large number of firms exporting the product. Most of these products are basic manufacturing products which are relatively easy to produce.<sup>23</sup>

The median (mean) total number of distinct products imported by the firm within a main export product is 637 (773). Figure 16 displays the total number of distinct import products imported by firms exporting in a main product. Most of these import products, however, only appear once or twice in the data. The median number of times the product was imported is 1 in 59.9% and 2 in 38.4% of the cases. Indicating that in most cases one firm imports the product for one year and sometimes two years or two different firms import the product once. Nonetheless it does show the diversity of products that firms within a main export product import. Of course not all of these imported products are inputs for the main export product.

<sup>22</sup>The minimum total yearly value that the main product in the 100 list accounts for is 7.7% however the 1st percentile is already 19.6% and the 10th percentile 39.0% clearly indicating that the main product in almost all cases accounts for a large majority of the total yearly export revenue.

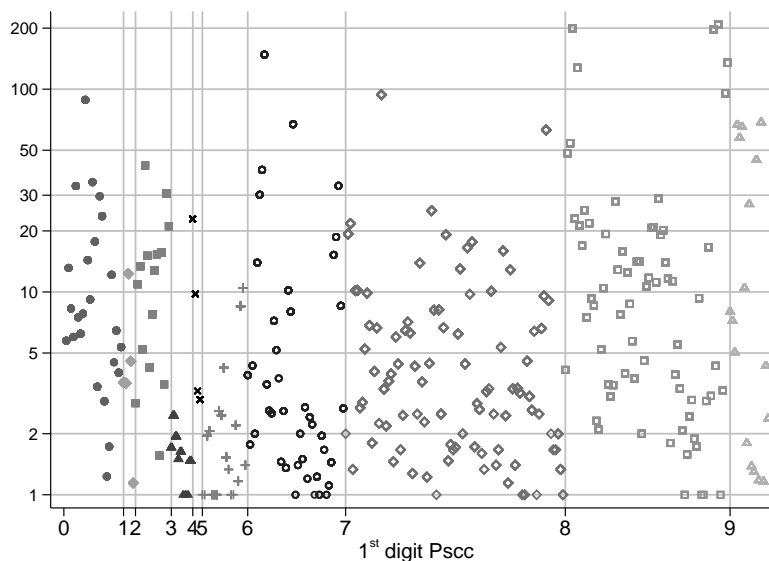
<sup>23</sup>Statuettes and other Ornaments (6354903), furniture of wood or of rattan (8215909 and 8217903), Articles for Christmas Festivities (8944500), Imitation Jewelry (8972909) and Other basket work (8997119).

Figure 14: Percentage Firm Yearly Revenue Accounted for Main Product



Notes: This figure summarizes the average percentage of firm yearly revenue accounted for by the main product. The minimum is obtained for product category 3344002 (other fuel oils — bunker oils)

Figure 15: Average Number of Firms per Year

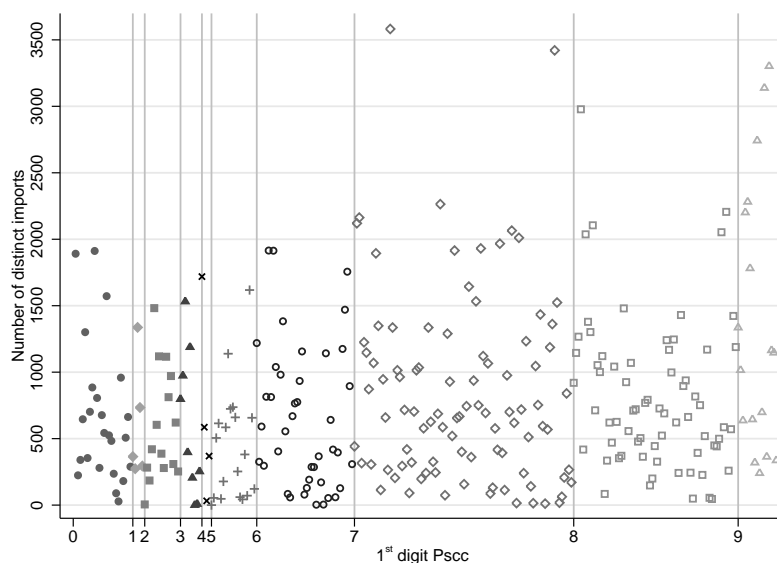


Notes: This figure summarizes the average number of firms per year that export the respective main export product as main product. The vertical axis is in logarithmic scale however the value labels give the exponentiated values in order to make the graph more comprehensible.

Many of the firms that export a certain main export product also import. This is even more the case for products that start with a 5, 7 or 9 digit. Firms in the consignment based export products have the highest percentage, 85.7%, of firms importing every year. For most medium and high skill products the percentage of firms that import per year is also high, respectively 81.0% and 74.8%. The percentage of importing firms seems to correspond with the skill needed to produce the product. Hinting on a high import content and the possibly that the consignment based, high and medium skill products are



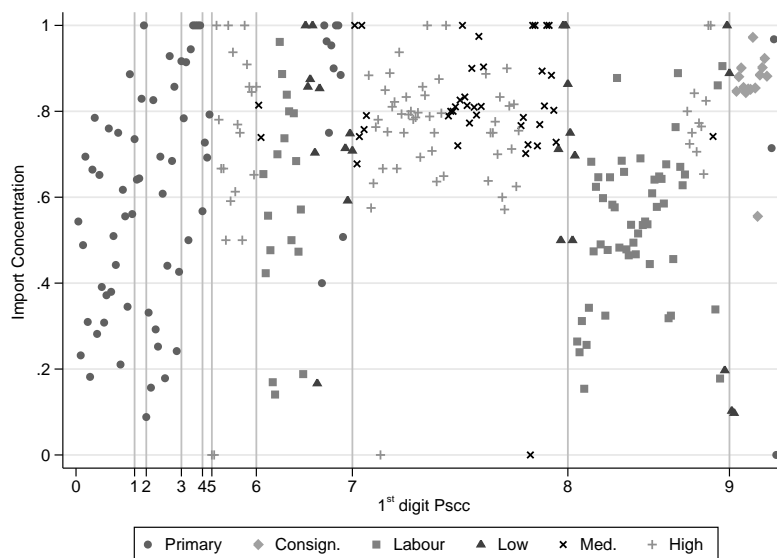
Figure 16: Number of Distinct Imports Imported by Firm by Main Export Product



Notes: This figure summarizes the total number of distinct products imported by the main export product.

only assembled in the Philippines. The lowest average percentage of firm-year observations of firms that import is observed for labor intensive products where, on average, in 55.1% of the firm-years observations firms also import when they export.

Figure 17: Percentage of Total Firm Year Observations in Which the Firm also Imports by UNCTAD Classification



Notes: This figure summarizes the percentage of firm year observations in which the firm imports by the main product. Therefore 1 denotes that in 100% of the firm-year observations in which a certain main product is exported the firms always import. Many electronic products located in the 7 digit sector have firms that always import indicating the probability of import content.

The main import product input per main export product is analyzed. There are two ways in which

the main input product is selected. The first method is by calculating the percentage of firms that import the respective product every year. The import product that is most frequently imported is linked to the main export product as input. The second method is to take the main import product in terms of import value per firm per year and then take the most frequently appearing main import product of all firms that export the same main export product. In 42.2% of the cases the two methods lead to the same main input. The second method is the one used in the analysis. This method has the advantage that it uses both the frequency and the value in order to identify main inputs. Firms that make large capital investments can have these imports enter as main inputs in some years. However by taking the mode of all firms in all years the main input product is filtered out. Both methods nonetheless indicate that most of the medium skill, high skill and consignment based products have relatively high skilled imported input content. In most cases there are strong indications that at least part of the value added is imported by these product categories. The clearest case for imported value added and possibly final assembly is observed for products produced with consignment based materials. The main imported inputs are materials needed to produce the goods. For example Watches manufactured from materials from consignment basis has as major input watch parts. Firms with a consignment based product as main export often have as main imported input a corresponding part for the production of the product. This combined with the high yearly import percentage indicates that consignment based producing firms are possibly specialized in product assembly and at the very least import part of the value added.

For high skilled products the case is less clear cut. First of all there are 3 main high skill export products for which the firms never import.<sup>24</sup> Of the 77 high skilled export products in which firms also import 77.9% have a high skill product as main imported input. However another 18.2% of the main imported inputs are medium skill and (often high skilled) consignment material inputs. Therefore most of the main imported inputs have a high skill content. More than 61% of the high skilled products are located in the Machinery and transport equipment section (section 7). In this section the high skill export products attains the highest percentage of high skilled main inputs of 85.7%. Indicating that for 42 of 49 high skilled export products the main input product is also a high skilled imported input. The remaining main imported inputs are medium skilled products and (high skilled) consignment based materials. Most of the imported inputs being parts and components for the respective export product. For the other two sections, 5 and 8, in which high skilled products are produced firms also often import a high skilled input. For Chemicals and related products, n.e.s. (section 5) 11 of the 20 and for Miscellaneous manufactured articles (section 8) 7 of the 11 main export products have high skilled inputs as main import product.

For medium skilled products it is the same as for high skilled products. In 72.5% of the medium skill exporting products import as main input a medium skilled product. In fact in 90% of the medium skill exporting products have medium or high skill imported inputs. Also indicating that for medium skilled exports the skill of the imported main input is relatively high. Philippine firms therefore add less value to these products than than would appear at first sight. The data indicates that there are clear signs that the increased skill content in the Philippine exports is at least in part due to skill-biased imported inputs.

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<sup>24</sup>These products are Propene (5111200), Toluene (5112300) and other particle accelerators (7787109).

## 5 Conclusion

This paper summarizes stylized facts on Philippine trade. There are more Philippine importers than exporters. However it are the firms that both export and import that dominate the trade data as they are much larger. Philippine trade has remained relatively stable as 299 (310) products constitute, on average, 91.0% (75.9%) of the yearly total export (import) value. There are many destinations to which and products that are exported sporadically. The majority of trade is concentrated in relatively few destinations, products and firms. There is, also, tentative evidence of a transition over time in terms of exported products, as the Philippines exports more medium and high skilled products. However part of this upgrade is due to higher and medium skilled inputs that are imported by these same firms. Suggesting the possibility that at least part of this so called upgrading of products cannot be attributed to upgrading of skills in the Philippines.

## References

Manova, K. and Z. Zhang, "Export Prices across Firms and Destinations," *Quarterly Journal of Economics*, 2012, 127, 379–436.

## A Product Classification

Table A.1: Product Classification\*

	SITC rev3
Primary commodities	0 + 1 + 2 + 3 + 4 + 68 + 667 + 971
Consignment Basis	931 – 93103 – 93104 – 93105 – 93106 – 93107 – 93108 – 93109
Labor-/resource-intensive products	61 + 63 + 64 + 65 + 66 + 82 + 83 + 85 + 894
Low-skill/ low-tech/ low capital intensive products	67 + 69 + 785 + 786 + 791 + 703 + 895 + 899 + 892 + 897 + 898 + 896
Medium-skill/ medium-tech/ medium capital intensive products	62 + 71 + 72 + 73 + 74 + 77 – 776 + 781 + 782 + 783 + 784 + 893
High-skill/ high-tech/ high capital intensive products	5 + 75 + 776 + 76 + 87 + 88 + 891 + 792

\*Based on UNCTAD product classification

## B Top 10 Exported and Imported Products

Table B.1: Top 10 Export Products 1991-2012 in Terms of Revenue

PSCC 7	# of years	Description
0361100	1	Shrimps & Prawns, Frozen
4223100	7	Coconut (Copra) Oil, Crude
6353909	3	Other builders' joinery and carpentry of wood, n.e.s.
6821201	9	Cathodes & sections of cathodes, of refined copper
7285507	1	Parts, n.e.s., of other machines and mech'l. appliances having individual functions
7523002	10	Portable digital automatic data processing machines, weighing not more than 10 kg, consisting of at l.
7526000	6	Input or output units for automatic data processing machines, whether or not presented w/the rest of
7527000	12	Storage units, whether or not presented w/the rest of a system
7529009	2	Other data processing equipment, n.e.s
7599700	16	Parts & accessories of machines of 752
7641100	2	Telephone sets
7731300	3	Ignition wiring sets and other wiring sets of a kind used in vehicles, aircraft or ships
7731301	14	Electrical wiring harness for motor vehicles
7763200	2	Transistors(excluding Photosensitive) w/dissipation rate of less thn 1 watt
7763900	12	Oth semi-conductor devices
7764100	5	Digital monolithic integrated units
7764109	12	Other monolithic digital integrated circuits
7764300	1	Non-digital monolithic integrated [units] circuits
7764900	21	[Other] electronic [integrated circuits and] micro-assemblies
7768900	1	Parts of electronic integrated circuits & micro-assemblies
7843919	3	Oth parts & accessories, nes, of motor vehicles of groups 722, 781, 782 & 783
9310205	8	Women's wear, manuf from mat'l on consign basis
9310206	9	Men's wear, manuf from mat'l on consign basis
9310207	5	Children's & infants'wear, manuf from mat'l on consign basis
9310221	22	Semi-conductor devices, manuf from mat'l on consign basis
9310222	4	Diodes, manuf from mat'l on consign basis
9310229	22	Finished elect'l & electronic machinery & parts, manuf fr mat'l consign basis
9310299	7	Oth products manuf from mat'l on consign basis, nes

*Notes:* This table shows the list of product that have at least in one year is a top 10 export product, in terms of revenue, for the Philippines. Column (1) shows the 7-digit code for the product group. Column (2) shows the number of year the product is in the top 10. Column (3) gives the definition of the product.

Table B.2: Top 10 Import Products 1991-2012 in Terms of Revenue

PSCC 7	# of years	Description
0412000	4	Other wheat (including spelt), unmilled
0412009	8	Meslin
0423102	5	Rice, Semi/Wholly-milled, Excl'dg broken rice
2831002	8	Copper concentrates
3330000	22	Petroleum oils & oils from bituminous minerals, crude
3341102	8	Motor spirit (gasoline)
3343003	9	Other fuel oils or Gas oils
3343009	1	Gas oils
6726900	1	Semi-finished products of iron/non-alloy steel contg less thn 0.25% carbon, nes
7128000	1	Parts for parts for steam turbines & oth vapor turbines
7284919	1	Other machinery and mech'l. Appliances, having individual functions, n.e.s.
7599700	18	Parts & accessories of machines of 752
7643204	4	Other cellular phones
7649109	7	Parts and accessories suitable for use solely or principally with the apparatus of division 76.1;
7649332	1	Parts & accesrs of apparatus & equipment of subgr 7643 & 7648 (excl'dg tv camera p/a)
7722009	1	Oth printed circuits
7764109	12	Digital monolithic integrated units; Other   Other
7764300	7	Wafers and discs, electrically circuit-programmed, whether or not coated on one side with gold or aluminum
7764900	3	[Other] Electronic [integrated circuits and] microassemblies
7768900	17	Frames or lead frames, being part of integrated circuits, composed of substances of any following characters
7812021	1	Passenger cars w/spark ignition combustion engine, exceeding 1,500 not 3,000 cc, new
7812071	4	Components, parts &/or accessories imported from one or more countries for assembly of [Passenger cars]
7924000	6	Aeroplanes and other aircraft, mechanically-propelled (other than helicopters), of an unladen weight exceeding 15,000 kg;
7935909	1	Oth light vessel, fire-float, floating crane & oth vessel, n.e.s
9310103	4	Frabrics consignment basis for embroidery/manuf of outer garments
9310111	22	Dice of any material
9310119	21	- - Other
9310191	21	Mat'l & accesrs, consign, for manuf of elect'l & electronic machinery, & parts
9310199	2	Oth mat'l, accesrs & supplies, consign basis for manuf of products, n.e.s

*Notes:* This table shows the list of product that have at least in one year is a top 10 import product, in terms of revenue, for the Philippines. Column (1) shows the 7-digit code for the product group. Column (2) shows the number of year the product is in the top 10. Column (3) gives the definition of the product.