



USAID
FROM THE AMERICAN PEOPLE

Report: Cost of Teaching and Learning Materials

Data and Evidence for Education
Programs

September 2021

Acknowledgments

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Acronyms and Abbreviations

DEEP	Data and Evidence for Education Programs
MEL	Monitoring, Evaluation, and Learning
PO	Purchase Order
RFQ	Request for Quotation
TLM	Teaching and Learning Material
USAID	United States Agency for International Development
USD	U.S. Dollar
VAT	Value Added Tax

Executive Summary

The cost¹ of printing and distributing teaching and learning materials (TLMs), particularly books, is of importance to all stakeholders involved in improving the quality of education systems in low- and middle-income countries. Donors, implementing partners, and ministries of education must know the cost of different book types and what influences these costs across different contexts to inform activity design and expectations as well as scale-up and sustainability initiatives. However, data on the cost of books and what influences these costs in different contexts are not available to the public, leading to uninformed decision-making.

Using data shared from USAID implementing partners, this study provides an initial overview of book cost data from around the globe and serves as a valuable starting point for deeper analysis in future studies, which can ultimately improve book procurement processes and provide information to help reduce per-unit book costs.

Research Objectives and Questions

The objective of this study is to identify both the range of costs for different types of books and what influences these costs in USAID-supported contexts. The study's primary research questions are:

1. What is the average per-unit price and the per-unit price range of printing similar types of TLMs at the global and regional/sub-regional level?
2. What is the average procurement cost of each type of TLM (i.e., printing, shipping, customs and clearance, tax, and distribution)?
3. What book and print order characteristics (e.g., quantity ordered, page count, cover weight) drive the per-unit price of TLMs?

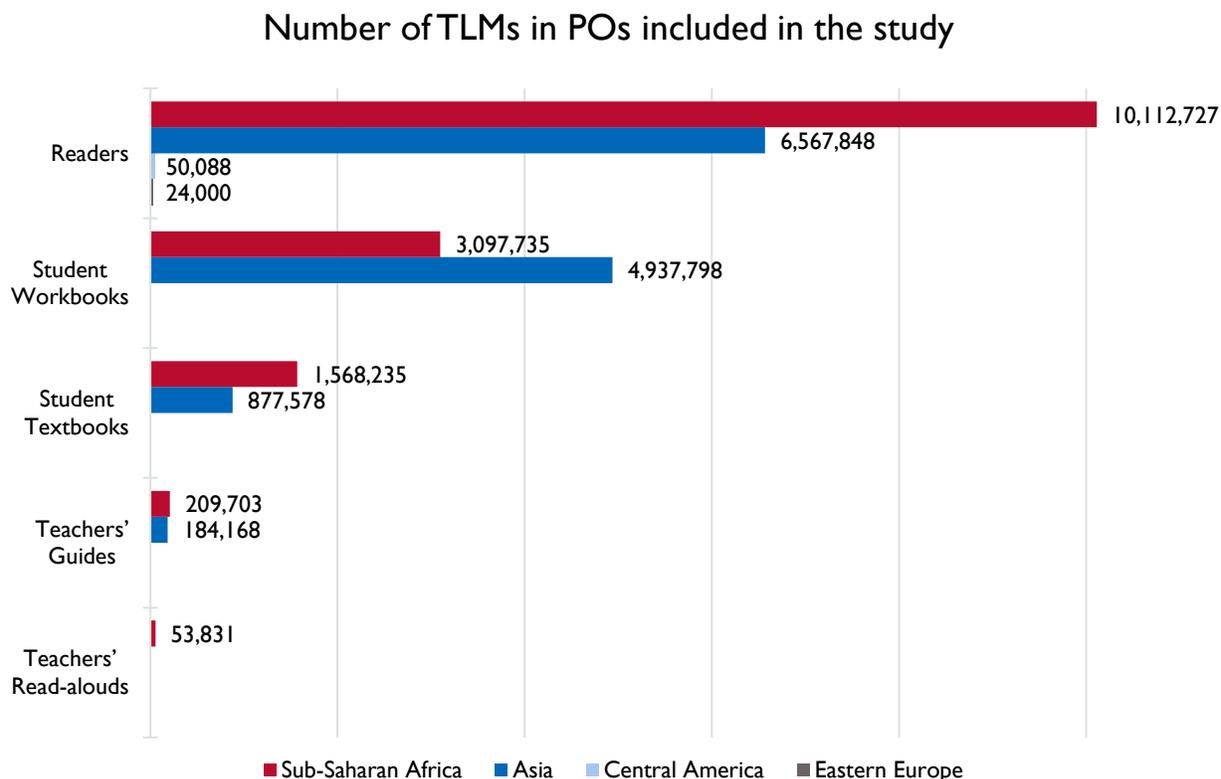
All data used for this research came from the purchase orders (POs), requests for quotations (RFQs), and price lists provided by implementing partners in 2020. A total of 44 POs/PO modifications, seven RFQs, and two price lists were analyzed. These POs, RFQs, and price lists include 885 unique titles and 27,685,711 individual books. The data represent 17 USAID-funded activities active in 2012–2019 in 16 countries.

Findings

Overall, the types of TLMs included in the study varied by region. [Exhibit I](#) shows the quantities of TLMs ordered by type and sub-region.

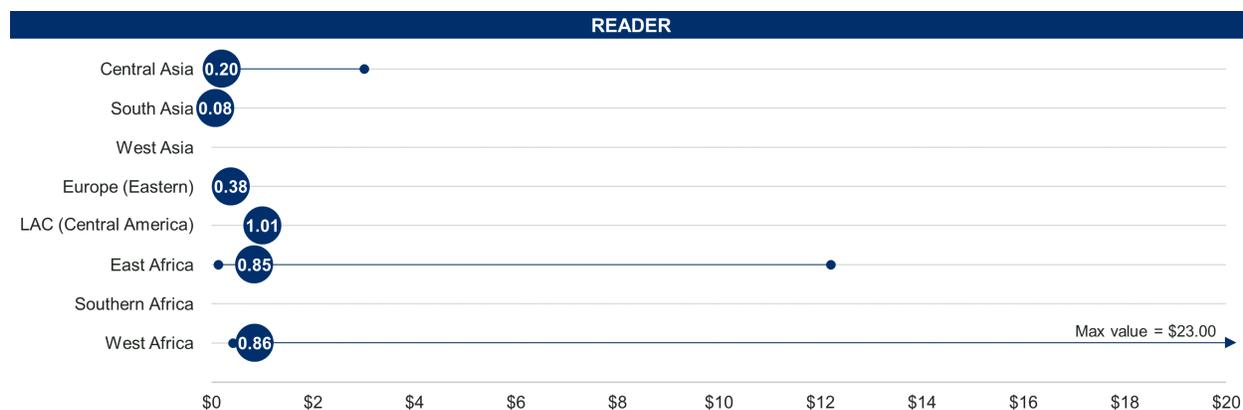
¹ Cost and price are two distinct terms with different meanings. “Cost” is inclusive of “price.” For the sake of simplicity, this summary uses the term “cost.” The full report defines both “cost” and “price” and uses them accordingly in the text.

Exhibit 1: Quantities of TLMs ordered by type and region (n= 27,685,711 TLMs)



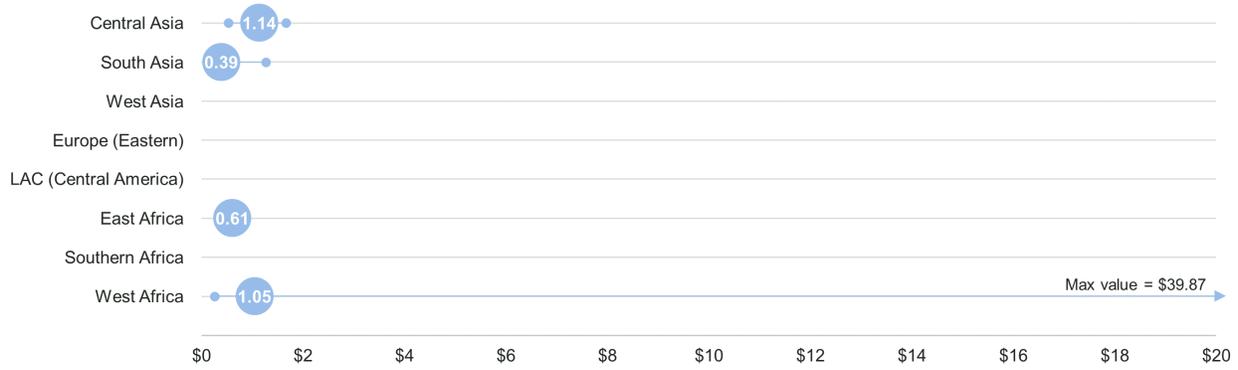
In most regions, readers, followed by student workbooks, had the lowest cost. The TLMs with the highest cost varied by region. [Exhibit 2](#) shows the average cost and cost range of readers, student workbooks, and teachers' guides by type of TLM and region.

Exhibit 2: Average cost and cost range of TLMs, all costs in real 2019 USD (n=885 titles)



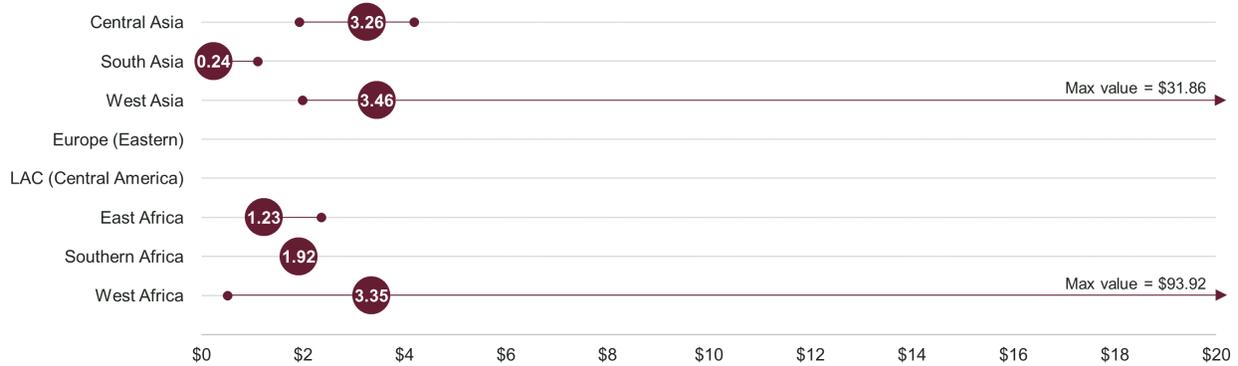
Data source: Central Asia: 2 POs, South Asia: 1 price list, Eastern Europe: 1 PO, Central America: 1 PO, East Africa: 19 POs, 1 price list, West Africa: 3 POs

STUDENT WORKBOOK



Data source: Central Asia: 7 POs, South Asia: 1 price list, East Africa: 1 price list, West Africa: 9 POs, 1 price list

TEACHER'S GUIDE

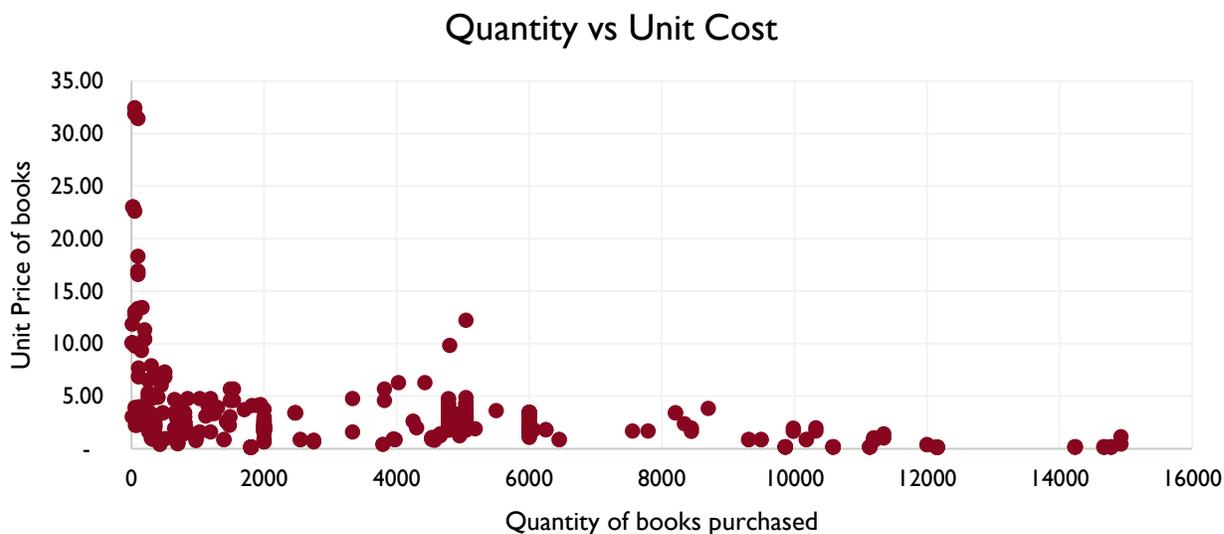


Data source: Central Asia: 7 POs, South Asia: 1 price list, West Asia: 1 PO, East Africa: 1 price list, Southern Africa: 1 price list, West Africa: 12 POs, 1 price list

Overall, costs for books were lowest in South Asia. For both readers and teachers' guides, the highest cost from South Asia was lower than the lowest cost of those TLMs in some other regions. For most TLMs, the broadest cost ranges occurred in West Africa, even when excluding outliers. Even within individual countries in West Africa, cost ranges could be broad.

Differences in order size may be an important factor affecting the cost of individual books. Indeed, the very highest costs appeared on print orders of just one or two books, which occurred in West Africa. [Exhibit 3](#) shows how the unit costs of individual TLM titles vary as the number of copies ordered increases. There is a steep drop in unit costs initially as the quantity of the order increases, then a more gradual decline as order size increases past a certain point.

Exhibit 3: Book order quantity vs unit cost in real 2019 USD (n=885 titles)



Quantity range limited to orders of 20–15,000 books for scale

These data provide preliminary evidence that while increasing the order size initially results in large book cost reduction, these savings become minimal after order sizes reach a certain quantity. This finding is consistent with other research that shows cost savings of print runs plateau at different size runs depending on the number of colors included in the TLM (DFID, N.D.).

Where data were available, the study investigated the different factors affecting per-unit costs, including quantity ordered, page count, total area, cover weight, type of binding, and type of cover. We found that the individual cost of a book is associated with eight variables, shown in [Exhibit 4](#).

Exhibit 4: Association between individual book cost and TLM characteristics (n=707 titles)

Variable	Pairwise Correlation Coefficient
Page Count	0.36*
Binding: High Durability	0.32*
Total Area (cm)	0.26*
Binding: Low Durability	-0.23*
Binding: Medium Durability	-0.09*
Cover Weight (cm)	0.08
Quantity Ordered	-0.07*
Cover Type: Durable	0.02

*Statistically significant at (0.10) level.

As expected, individual book cost decreases as the quantity ordered increases. We also found that binding type influences individual book costs. Bindings with low and medium durability decreased the per-unit cost of books, while more durable bindings increased the per-unit cost of books. For page count, total area, and binding durability for medium durable bindings, as the quantity or quality increases, the per-book costs increase. The data provided did not show sufficient variety in cover and internal color to determine the impact of color.

Conclusions and Recommendations

This study provides initial findings that can inform the design of future studies and provide guidance on how to better document the cost of books for USAID Education activity implementing partners. Key takeaways from the study are provided below:

- Purchase orders of USAID implementing activities do not consistently include all the factors that may influence the cost of books, limiting the extent of analysis possible with existing data.
- Readers had a lower cost than other types of TLMs in nearly all regions. However, inconsistent approaches to categorizing TLMs meant that the cost of different types of readers could not be compared. More consistent classification between implementing partners would allow for more detailed analysis of all reader types.
- There is a steep drop in unit prices initially as the quantity of the order increases, then a more gradual decline as order size increases past a certain point. Stakeholders should explore where savings from large orders plateau by book type and physical characteristics. Conversations around other influences on cost can augment the dialogue.
- Factors that influence individual book costs may include quantity ordered, page count, total area, and type of binding. Understanding these factors can inform discussions with stakeholders and printers around book specifications that balance cost, durability, and longevity of the TLM while maximizing pedagogical value.²

Based on the conclusions of this study, the study team recommends that USAID/Education:

- Convene a group of implementing partners to develop a reporting format that would allow for analysis of factors that influence cost. This format would include, at a minimum, data on the unit price of printing of TLMs, quantity ordered, shipping cost, shipping method, in-country distribution cost, in-country distribution method, applicable taxes (including customs and clearance), and details about the TLMs including book language, grade, number of pages, book dimensions, cover weight, cover coating, cover color, internal paper weight, internal color, illustrations, type of binding, and copyright vs Creative Commons.
- Implement a study on the cost of books using the above cost reporting format.

The study team recommends that implementing partners:

- Ensure that IPs routinely make use of the reporting format guidance noted above when creating or requesting purchase orders. This will allow for better accounting and tracking for implementing partners while also allowing implementing partners to more easily evaluate different cost options internally

² For more information on book development considerations, see blueTree Group. 2014. *Best Practices for Developing Supplementary Reading Materials*. Prepared for USAID. https://pdf.usaid.gov/pdf_docs/PA00JV69.pdf

Introduction

The cost of printing and distributing teaching and learning materials (TLMs), particularly books, is of importance to all stakeholders involved in improving the quality of education systems in low- and middle-income countries. Donors, implementing partners, and ministries of education must have an understanding of the relative costs of different book types and must understand cost drivers associated with book production. This understanding can then inform activity design and expectations as well as scale-up and sustainability initiatives. However, data on the price of printing books and cost drivers in different contexts are not available to the public, leading to uninformed decision-making.

The United States Agency for International Development (USAID)'s Center for Education has contracted with the Data and Evidence for Education Programs (DEEP) project to conduct initial analyses of cost data from a range of USAID's implementing partners working on education programs around the world. The implementing partners generously shared their printing purchase orders (POs), requests for quotations (RFQs), and other data sources to allow DEEP to identify the range of printing prices and average price of printing for a variety of TLMs.

TLM types include big books, readers (including items listed as decodable readers, leveled readers, decodable leveled readers, and supplemental readers), student textbooks, student workbooks, teachers' read-alouds, and teacher guides.³ Since a wide range of data were provided, the DEEP team is able to mask the identities of the implementing partners and activities, thereby ensuring anonymity. The findings from this study provide a valuable starting point for deeper analysis in future studies, which can ultimately improve book procurement processes and provide information to help reduce per-unit book printing prices.

TEACHING AND LEARNING MATERIALS

Big books: These are large versions of children's books meant to be read aloud by a teacher.

Readers: Readers commonly include letters, words, and decodable or leveled text. They are designed to provide opportunities for children to practice reading every day.

Student textbooks: These are study manuals for reading lessons and contain the contents and activities for each lesson.

Student workbooks: These are books in which learners can write or draw to practice a skill like writing or mathematics.

Teachers' read-alouds: Teachers' read-alouds contain collections of stories that can be read aloud to children to practice their oral comprehension skills.

Teachers' guides: This resource supports teachers' instruction by providing guidance on what skills to teach, how to teach them, and when they should be taught.

Source: Robledo and Gove, 2019; USAID, 2019.

³ Other types of TLMs were excluded from the study because they were not books or only included in a limited number of purchase orders in this study. These excluded types of TLMs are (1) audios and videos, (2) assessments, (3) parent resources, and (4) supplementary materials (e.g., alphabet boards).

Price: The monetary value exchanged in a market transaction for one unit of a good or service (e.g., the unit price of one leveled reader)

Cost: The total value of producing teaching and learning materials including printing, customs and clearance, tax and distribution (e.g., the cost to produce the leveled readers).

Cost Driver/Mitigator: A factor that creates or influences the cost of an input, an output, or a result.

Source: Walls, Tulloch, and Harris-Van Keuren, 2020.

Study Objectives

The primary objective of this study is to identify both the range of prices for printing different types of books in the areas where USAID works and the drivers of printing costs in these contexts.

Research Questions

The study's primary research questions are:

1. What is the average per-unit price and the per-unit price range of printing similar types of TLMs at the global and regional/sub-regional level?
2. What is the average procurement cost of each type of TLM (i.e., printing, shipping, customs and clearance, tax, and distribution)?
3. What book and print order characteristics (e.g., quantity ordered, page count, cover weight) drive the per-unit price for TLMs?

Methods

The unit of analysis for this research is the book printing PO. All data used for this research came from the POs, RFQs, and price lists provided by implementing partners in 2020. The specific ways in which the study used data to answer each research question are outlined in [Annex A: Research Matrix](#). Further information on the data, analyses, and study limitations are outlined below.

Data

The original data for this study included 24 USAID-funded activities based in 21 countries with 99 POs/PO modifications, 27 RFQs, six records of refunds, and two price lists created by the partners (one activity-specific, one across multiple activities). As shown in [Exhibit 5](#), a total of 44 POs/PO modifications, seven RFQs, and both price lists were analyzed⁴ after excluding POs that did not meet

⁴ These price lists were used in place of POs when POs are not available. One of the price lists provided extensive information about the books, the other provided only quantity ordered, unit price, and, when relevant, shipping and VAT.

the data thresholds. These POs, RFQs, and price lists include 885 unique titles and 27,685,711 individual books. The data represent 17 USAID-funded activities active in 2012–2019 in 16 countries. The list of countries included is shared in [Annex B](#).

Exhibit 5: Data Source by Year and Type

Data Source	2012	2013	2014	2015	2016	2017	2018	2019	Total
Purchase Order	0	0	1	1	1	14	10	17	44
Price List	2 price lists with entries spanning 2012–2019								
RFQ					1	1	2	3	7

Fifty-five POs/PO modifications, 20 RFQs, and all six records of refunds were excluded from study. POs were excluded if they (1) were illegible (n=14), (2) did not include any types of TLMs included in the study (n=15), (3) did not include printing price (i.e., focused on development or distribution of TLMs only) (n=8), (4) were duplicative (i.e., the same information appeared on another PO or RFQ) (n=9), or (5) included insufficient data to calculate per-unit printing price (n=9). Duplicative RFQs were excluded. A total of six POs in the sample included total price miscalculations, all but one of which favored the implementing partner over the printer.⁵

Data captured in POs varied considerably. On one end, the data from some implementing partners (11 POs) provided only the total price of the PO and the quantities of individual titles and did not include unit printing prices or overall printing prices by title (in two cases the unit price could still be calculated as they provided the per page price and number of pages of each title). On the other end, some POs provided data on several variables, including book language, grade, number of pages, book dimensions, cover weight, cover type, cover color, internal paper weight, internal color, illustrations, type of binding, and whether or not the purchase was exempt from VAT and other taxes.

[Exhibit 6](#) shows the frequency with which different items were included in POs. [Annex C](#) provides examples of the tables used to present these details in purchase orders. None of the POs included all of these variables.

⁵ In all six instances, the amount was relatively small (most were likely the result of a rounding error). Given that this study used the unit price data, rather than the total price per title, the study was unaffected by the miscalculations. However, these errors do affect both the overall affordability of books and the printers' profit margins and implementing partners should take care to avoid them in the future.

Exhibit 6: Information Available in Purchase Orders

Information Available on PO ⁶	# of POs That Include This	% of POs That Include This (n = 44)
Cover Paper Weight	23	52%
Internal Paper Weight	23	52%
Binding Type	23	52%
Page Dimensions	23	52%
Internal Page Color	23	52%
Cover Color	22	50%
Number of Pages	22	50%
Cover Type	22	50%
Grade	15	34%
Other Taxes	15	34%
Value Added Tax	7	16%
Distribution Costs ⁷	7	16%
Illustrations	3	7%
International Shipping Costs	2	2 of 3*
Shipping Method	1	1 of 3*

*Shipping Method and International Shipping Costs were only applicable for three purchase orders.

Analysis

This study used USAID/Education's cost-economy cost analysis method. Cost-economy is used to analyze retrospective expenditure data and provide a structured methodological protocol for estimating the cost of a prospective activity (Walls et al. 2020). In this analysis, cost-economy is used to examine POs, RFQs, and price lists for USAID-funded education activities.

Relevant TLM data obtained from POs, RFQs, and price lists were organized in Excel. Variables included type of TLM, unit printing price, languages, quantity purchased, specifications (i.e., binding type, cover type, cover paper weight, total area⁸), shipping, customs and clearance/import tax, in-country distribution, and copyright vs Creative Commons license. Once organized in Excel, the data were analyzed to identify the weighted average unit printing price⁹ and the printing price range of TLMs (disaggregated by region and sub-region). See [Annex D](#) for a description of the variables included in this analysis.

As a secondary analysis, the costs for international shipping, domestic distribution, and value added tax (VAT) were added to the weighted averages and printing price ranges where data were available. For POs that included data on shipping and distribution costs, the cost was calculated at the level of the

⁶ Customs and clearance were never recorded in the data.

⁷ When POs did not explicitly include distribution costs, the study proceeded under the assumption that distribution was not part of the contract and that a small cost for delivery to the implementing partner's offices was likely factored into the price of books.

⁸ Total area was derived by multiplying the length by the width. The unit is in centimeters.

⁹ The study team used a weighted average unit price (i.e., the average of the unit price of individual copies of the book rather than the average of the unit price of each title) as this reflects more useful information for USAID and implementing partners.

entire shipment, rather than for individual TLMs. Therefore, shipping costs were distributed across the total number of TLMs in the order.¹⁰ VAT is a percentage of total value, and therefore could be distributed more accurately. The study proceeded under the assumption that TLMs were exempt from VAT unless the PO explicitly stated otherwise.

Using Stata 14.2, a sub-sample of data were explored to identify potential drivers to individual book costs. These cost drivers help point to book characteristics, including quantities ordered, that can have pragmatic value for stakeholders in charge of ordering books in the future.

Per USAID/Education’s cost-economy protocol, all monetary values were converted from the original currency into U.S. dollars (USD) using the World Bank average [official exchange rate](#) indicator and then adjusted for inflation using the World Bank [GDP deflator](#) indicator. All findings are presented in real 2019 USD.

In reporting this data, implementing partners, USAID activities, and countries have been masked to maintain privacy. Only global, regional, and (where possible), sub-regional findings have been presented.

Limitations

The primary limitation in this study is the inconsistent data included in the POs. As noted previously, only a small number of POs included a complete set of detailed book specifications needed to conduct in-depth analyses. Additionally, few provided shipping and distribution information, further limiting the extent of possible analyses. Furthermore, implementing partners did not always use the same classification system for types of TLMs. For example, the data provided across implementing partners did not allow the team to disaggregate decodable readers and leveled readers into separate categories. Therefore, one category, “student reader,” was used in the analysis.

In both purchase orders and databases, the study team identified a small number of data entry errors. Wherever possible, these were corrected based on the study team’s review of related purchase orders or database content. These corrections have been documented, but are confidential as they contain identifying information.

Finally, this study used data from 17 activities provided by a limited number of implementing partners. While this study can provide helpful information about purchase order quality and cost drivers, it cannot be used to indicate a generalizable price range for printing books.

Findings

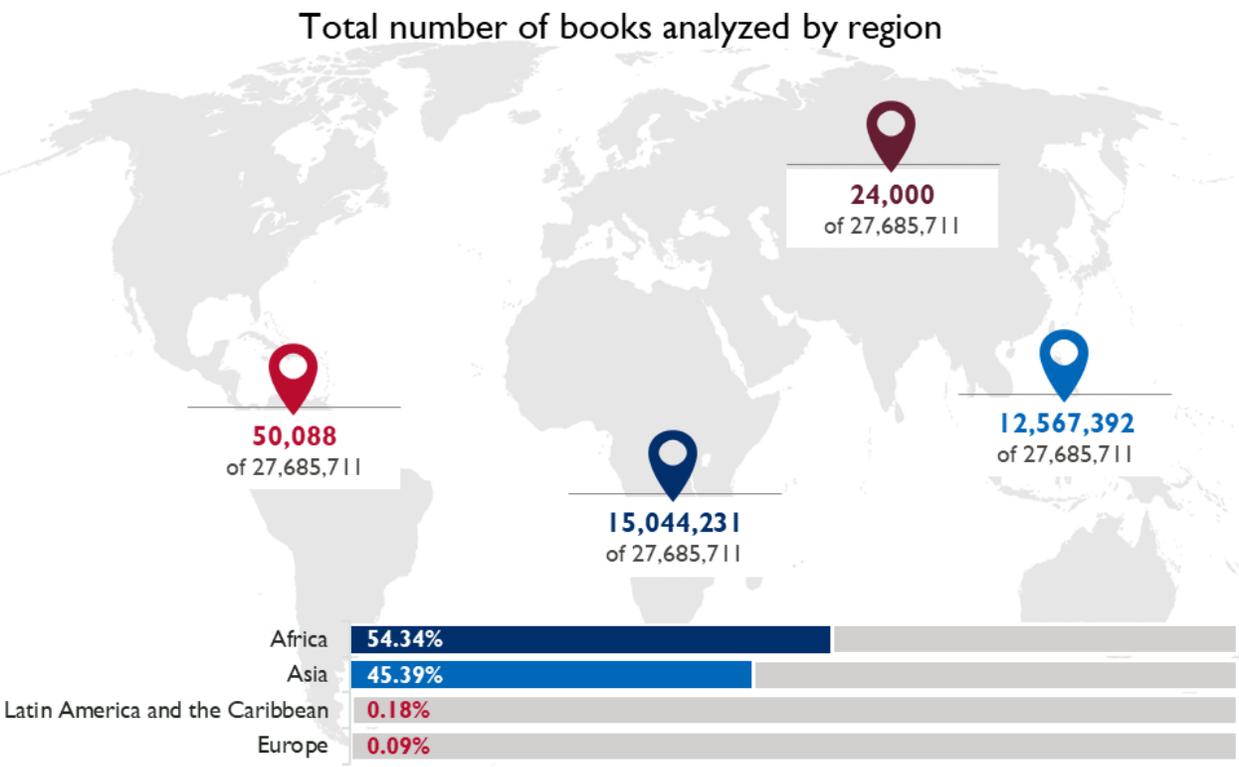
This section presents (1) descriptive statistics, (2) the price of printing TLMs (organized by TLM type and region where the activity occurred), and (3) factors that influence TLM cost.

¹⁰ It is likely this will only provide an approximation of the full per-unit cost, as shipping costs in particular are likely driven by the different weights of the books, which were infrequently recorded in the PO data.

Descriptive Statistics

Exhibit 7 provides a representation of the regional distribution of the 27,685,711 individual books reflected in the purchase orders and RFQs included in this study.

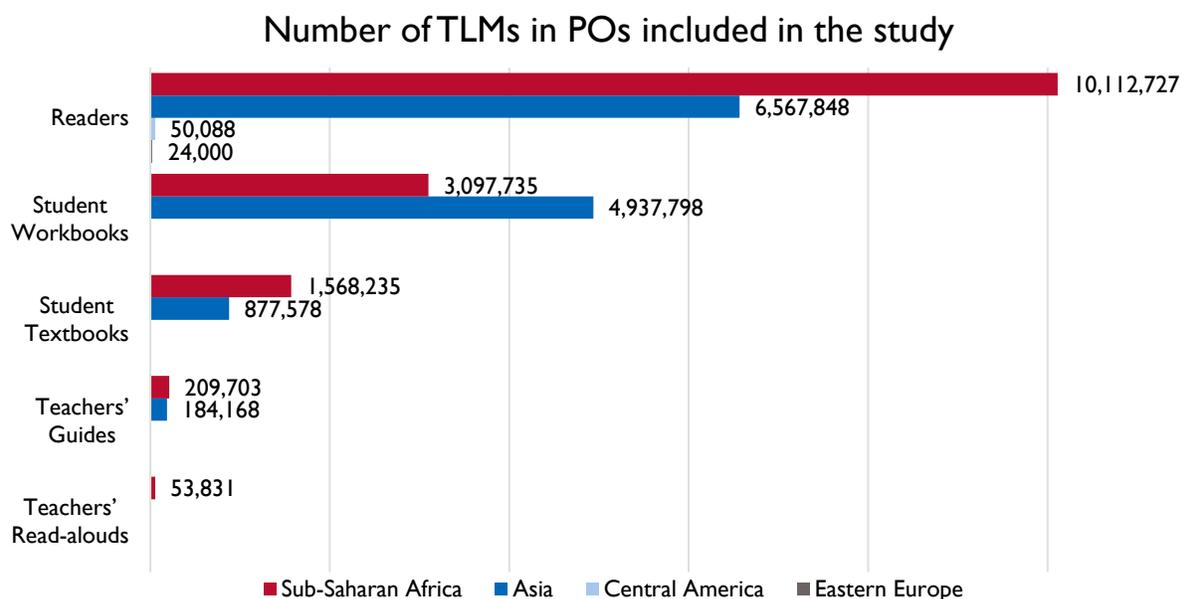
Exhibit 7: Geographic distribution of TLMs included in this study



Overall, the types of TLMs included in the POs varied by region. For example, some regions included only orders for readers, and other TLMs, such as big books and read-alouds, only appeared in orders from Sub-Saharan Africa.

Exhibit 8 shows the quantities of TLMs ordered in POs, RFQs, and price lists included in this study by type and sub-region.

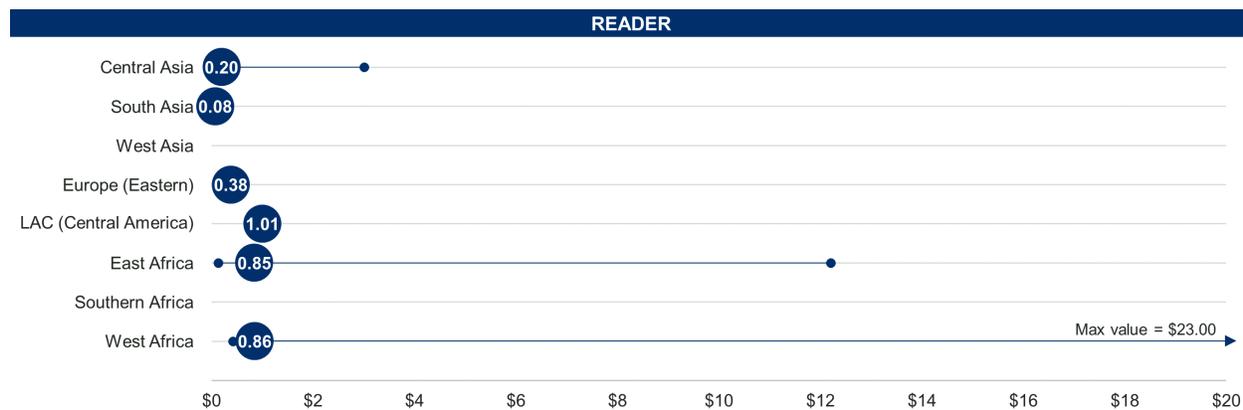
Exhibit 8: Quantities of TLMs ordered by type and sub-region (n= 27,685,711 TLMs)



Per-Unit Price of Printing Books

In most regions, readers, followed by student workbooks, had the lowest printing prices. The TLMs with the highest printing price varied by region. [Exhibit 9](#) shows the average price of printing and price range of TLMs by type of TLM and region. Further details, including precise numbers for the price ranges, can be found in the table in [Annex E](#).

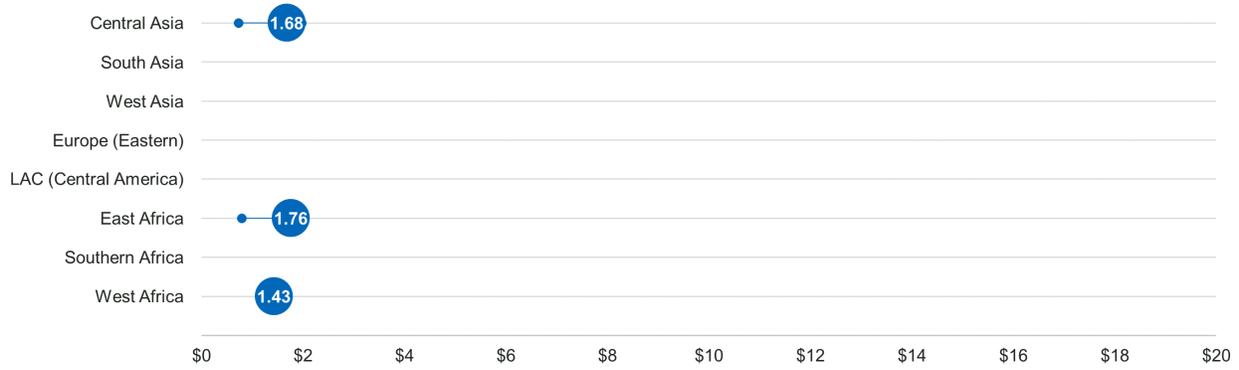
Exhibit 9: Average printing price and price range of TLMs, all prices in real 2019 USD (n=885 titles)¹¹



Data source: Central Asia: 2 POs, South Asia: 1 price list, Eastern Europe: 1 PO, Central America: 1 PO, East Africa: 19 POs, 1 price list, West Africa: 3 POs

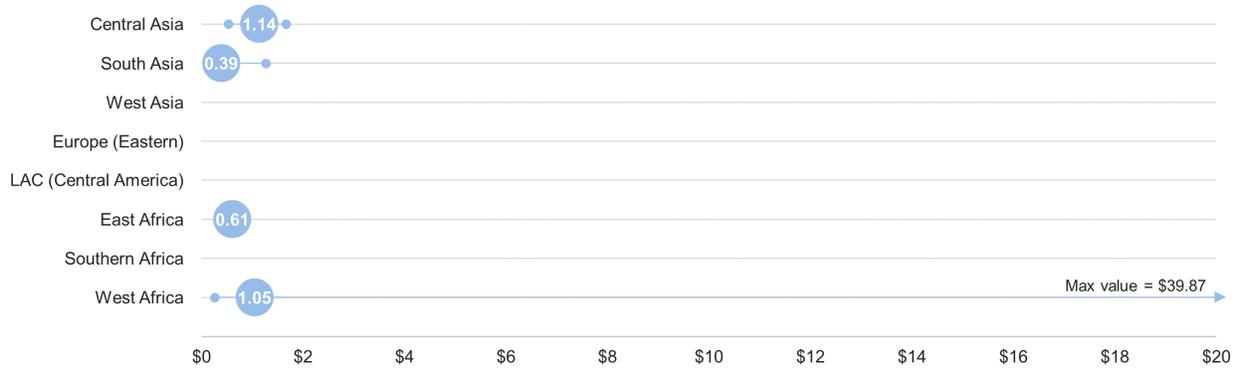
¹¹ For some TLMs in some regions, there is no price range or only one end of the range appears in the chart. This occurs in cases where (1) data come from a small number of POs or (2) data come from a single country in a price list with consistent pricing. In these cases, there was either not a range of prices (i.e., the price was the same for all titles) or there was limited variation and one or both ends of the price range appears to be the same as the average due to rounding.

STUDENT TEXTBOOK



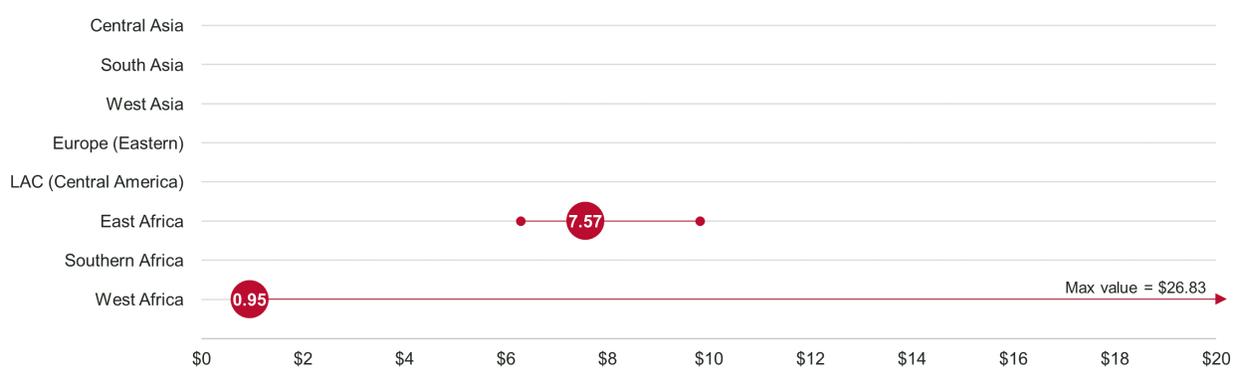
Data source: Central Asia: 7 POs, East Africa: 1 PO, 1 price list, West Africa: 1 price list

STUDENT WORKBOOK



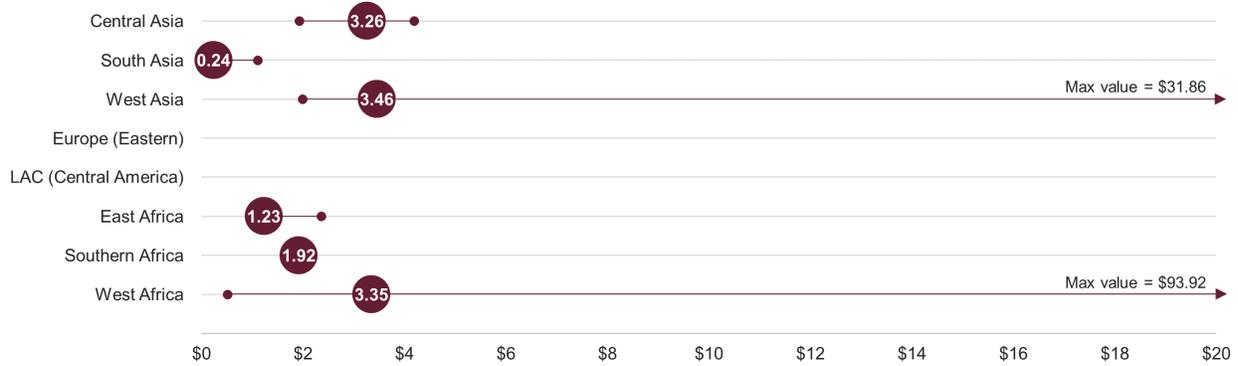
Data source: Central Asia: 7 POs, South Asia: 1 price list, East Africa: 1 price list, West Africa: 9 POs, 1 price list

TEACHER READ ALOUD BOOK



Data source: East Africa: 1 price list, West Africa: 3 POs

TEACHER'S GUIDE



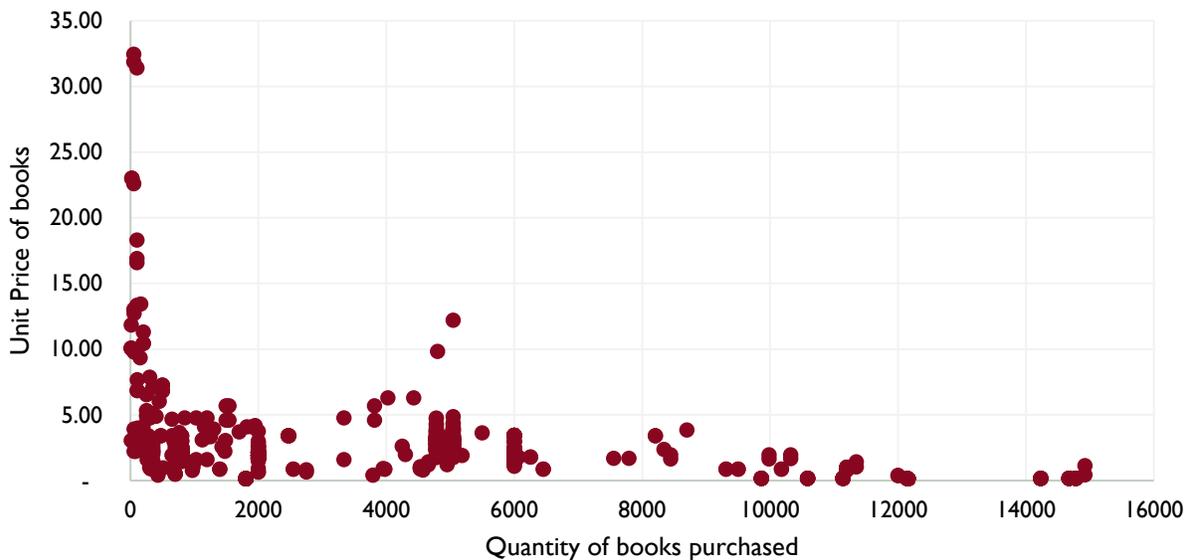
Data source: Central Asia: 7 POs, South Asia: 1 price list, West Asia: 1 PO, East Africa: 1 price list, Southern Africa: 1 price list, West Africa: 12 POs, 1 price list

Overall, prices for printing books were lowest in South Asia. For both readers and teachers’ guides, the highest price of printing from South Asia was lower than the lowest price of printing of those TLMs in most other regions. For most TLMs, the broadest price ranges occurred in West Africa, even when excluding outliers. Even within individual countries in West Africa, price ranges could be broad.

Differences in order size may be an important factor driving the price of printing individual books. Indeed, the very highest prices appeared on print orders of just one or two books which occurred in West Africa. [Exhibit 10](#) shows how the unit prices of printing individual TLM titles vary as the number of copies ordered increases. There is a steep drop in unit prices initially as the quantity of the order increases, then a more gradual decline as order size increases past a certain point.

Exhibit 10: Book order quantity vs unit price in real 2019 USD (n=885 titles)

Quantity vs Unit Price



Quantity range limited from orders of 20 – 15,000 books for scale

These data provide preliminary evidence that there is not a linear relationship between printing price and quantity. This finding is consistent with other research. For example, the Foreign, Commonwealth, and Development Office (FCDO) (formerly DFID) found that the price-reducing effect of print runs would plateau depending on the number of colors included in the texts (at 35,000 to 50,000 copies for four-color books and at 7,500 to 10,000 copies for one-color books) (DFID, N.D.). In addition to color, there are several factors that may drive the lower price of printing larger orders of TLMs. These include lower prices from printers with the capacity to print larger amounts, implementing partners deliberately choosing cheaper options when printing large quantities of TLMs (e.g., cheaper binding, smaller page sizes, lower weight paper), and other factors. The data available in this study are not sufficient to understand the extent to which these reasons affect this lower cost of high quantity orders.

Total Per-Unit Price of Printing Books and Other Costs

Other costs investigated in this study include VAT, international shipping, and domestic distribution. While limited, the data provide initial findings that could inform further studies.

Regarding VAT, data come from five countries with VAT rates of 11.5 percent, 14 percent, 16 percent, 17.5 percent and 18 percent. In terms of international shipping, a total of six activities noted that they used out-of-country printers for at least one of their POs. However, only two activities (regions excluded for anonymity) included shipping as a separate line item. Given the small number of activities reporting shipping and distribution data, it is impossible to generalize these findings. These findings should be seen as indicative of possible impact only.

For the two activities that listed shipping as a separate line item, international shipping raised the unit cost of most books by pennies. However, one of the POs provides an interesting case study in different costs based on different types of shipping. In this PO, shipping for the order of big books was split; some were sent via sea freight while a small set were sent via air freight. Shipping by sea increased the cost of big books by \$0.03 per book. However, shipping the same big books by air increased the cost by \$3.60. This higher cost could be explained by the small quantity of big books ordered. While only data from a single source, this indicates that shipping via air may increase the per-unit cost of TLMs dramatically. Therefore, advanced planning and avoiding last-minute orders are important considerations for TLM costs.

A total of six activities provided data on in-country distribution to schools.¹² Most other POs stipulated delivery to the implementing partners' country office, usually located in the capital. Most in-country printers hired were also located in their respective country's capital, so these deliveries likely had minimal cost.¹³ [Exhibit 11](#) shows how the costs were impacted by in-country distribution.

¹² Implementing partners and printers may include distribution in a separate PO from book printing. Future studies should specifically request POs for both printing and dissemination.

¹³ These implementing partners likely incurred other distribution costs either through delivery of the books themselves or by hiring other contractors for delivery; however, data on these costs were not provided.

Exhibit 11: Impact of in-country distribution on cost of TLMs, all prices in real 2019 USD (n=108 titles)

	Student Workbooks (No distribution)	Student workbooks (With distribution)	Teachers' Guides (No Distribution)	Teachers' Guides (With distribution)
Asia				
Central Asia				
<i>Average Unit Cost</i>	\$1.07	\$1.10	\$3.26	\$3.31
<i>Minimum Cost</i>	\$0.53	\$0.56	\$1.93	\$1.94
<i>Maximum Cost</i>	\$1.66	\$1.70	\$4.19	\$4.21
South Asia				
<i>Average Unit Cost</i>	\$0.39	\$0.41	\$0.24	\$0.26
<i>Minimum Cost</i>	\$0.15	\$0.16	\$0.08	\$0.10
<i>Maximum Cost</i>	\$1.26	\$1.32	\$1.11	\$1.16
Sub-Saharan Africa				
East Africa				
<i>Average Unit Cost</i>	\$0.61	\$0.66	\$1.23	\$1.28
<i>Minimum Cost</i>	\$0.61	\$0.66	\$1.09	\$1.14
<i>Maximum Cost</i>	\$0.61	\$0.66	\$2.36	\$2.39
West Africa				
<i>Average Unit Cost</i>	\$1.15	\$1.21	\$3.58	\$3.68
<i>Minimum Cost</i>	\$0.26	\$0.27	\$0.98	\$0.98
<i>Maximum Cost</i>	\$1.63	\$1.73	\$3.84	\$3.94

Note: Data is also available for readers and student textbooks; however, the changes to these types of TLMs follow the same pattern as the TLMs included here. They have been removed for clarity.

The largest increases in unit cost due to in-country distribution both occurred in West Africa; student workbooks increased in cost by an average of six cents per unit while teachers' guides increased in cost by an average of 10 cents per unit. Most of this difference was driven by just one activity in the region; others saw smaller differences. In other regions, the cost of most TLMs increased an average of three to five cents when factoring in in-country distribution.

Factors That Influence TLM Prices

A sub-sample of the data including 707 titles were analyzed to explore potential factors that affect individual book printing prices. The data were analyzed for quantity ordered, page count, total area, cover weight, type of binding, and type of cover. The analysis found that individual book printing prices are associated with eight variables, shown in [Exhibit 12](#).

Exhibit 12: Association between individual book prices and TLM characteristics (n=707 titles)

Variable	Pairwise Correlation Coefficient
Page Count	0.36*
Binding: High Durability	0.32*
Total Area (cm)	0.26*
Binding: Low Durability	-0.23*
Binding: Medium Durability	-0.09*
Cover Weight (cm)	0.08
Quantity Ordered	-0.07*
Cover Type: Durable	0.02

*Statistically significant at (0.10) level.

As expected, quantity ordered is negatively correlated with individual book printing prices. This means that as more books are ordered the per-unit price of printing decreases. However, the relationship is quite small at seven percent. The type of binding used also affects the per-unit printing price of books. Bindings with low durability (e.g., gummed, saddle stitch, and spiral) and medium durability (e.g., gummed and stapled, square back and glued) were negatively correlated with the per-unit price of printing a book, while highly durable bindings (e.g., perfect and thermal) were positively correlated. This means that taking greater care to consider the advantages and disadvantages of binding types and the desired shelf life of a book could have a notable impact on the total cost of a TLM purchase order. Page count and total area have positive associations with individual book printing prices, meaning as they increase in size, the per-unit price of printing a book increases. Page count had the highest correlation percentage at 36 percent and total area of the book in centimeters had the third highest correlation at 26 percent. The data provided did not show sufficient variety in cover and internal color to determine the impact of color.

These findings can serve as valuable conversation starters between the stakeholders ordering the books and the printers providing the books. For example, exploring the per-unit printing price differences in the number of pages a book includes or the size of the book itself could provide savings without jeopardizing the pedagogical value of the TLM itself. Also, these findings can be used to explore how the quantity of books ordered can affect the cost of books. In this analysis, we found a small relationship between the quantity ordered and individual book printing prices. This may again demonstrate the non-linear relationship between individual book printing prices and quantity ordered (as previously discussed in this paper). While this is a small case study and the results should be read with caution, understanding where per-unit printing prices plateau for each type of book including their specifications will provide valuable information for all stakeholders interested in using money as wisely as possible for each USAID/Education activity.

Conclusions

This study provides initial findings that can inform the design of future studies and provide guidance on how to better document the cost of books for USAID Education activity implementing partners. Key takeaways from the study are provided below:

- There are several different formats in purchase orders, with variation both between different implementing partners and between country offices of individual implementing partners.
- Purchase orders of USAID implementing activities do not consistently include all the factors that may influence the cost of books, limiting the extent of analysis possible with existing data.
- Readers had a lower printing price than other types of TLMs in nearly all regions. However, inconsistent approaches to categorizing TLMs meant that the price of printing different types of readers could not be compared. More consistent classification between implementing partners would allow for more detailed analysis.
- Data on other cost drivers such as international shipping and in-country distribution are limited as implementing partners may rely on other contractors or internal mechanisms to implement these activities. Findings about some of these cost drivers are below:
 - Relatively few USAID activities that printed books out-of-country provided data.
 - Even when implementing partners used out-of-country printers, data on cost of international shipping was limited and the type of shipping (air, land, sea) was not often specified.
 - Relatively few activities included domestic distribution of POs to schools, generally only specifying delivery to offices in country capitals. Among those POs that did include domestic distribution to schools, this usually increased the cost of individual TLMs by three to five cents. However, this varied substantially by country. Given the small number of activities reporting shipping and distribution data, it is impossible to generalize these findings. These findings should be seen as indicative of possible impact only.
- There is a non-linear relationship between quantity ordered and the individual book price. Stakeholders should explore where savings from large orders plateau by book type and physical characteristics. Conversations around other potential cost drivers can augment the dialogue.
- Cost drivers for individual books may include quantity ordered, page count, total area, and type of binding. Implementing partners can use this information to inform discussions with stakeholders and printers around book specifications that balance printing price, durability, and longevity of the TLM while maximizing pedagogical value.¹⁴

¹⁴ For more information on book development considerations, see blueTree Group. 2014. *Best Practices for Developing Supplementary Reading Materials*. Prepared for USAID. https://pdf.usaid.gov/pdf_docs/PA00JV69.pdf

Recommendations

Based on the conclusions of this study, the study team has developed recommendations for both USAID and implementing partners. These are presented in turn.

The study team recommends that USAID/Education:

- Convene a group of implementing partners to jointly develop a reporting format that would allow for analysis of cost drivers. This format would include, at a minimum, data on the unit printing price of TLMs, quantity ordered, shipping cost, shipping method, in-country distribution cost, in-country distribution method, applicable taxes (including customs and clearance), and details about the TLMs including book language, grade, number of pages, book dimensions, cover weight, cover coating, cover color, internal paper weight, internal color, illustrations, type of binding, and copyright vs Creative Commons. Annex F provides a template for the tables this PO could include.¹⁵
- Implement a study on the cost of books using the above cost reporting format. This study should purposively work with implementing partners to identify a range of possible cost drivers based on the different approaches used by the implementing partners. This study should also include purposive sampling of activities to represent a range of regions around the globe.

The study team recommends that implementing partners:

- Ensure that IPs routinely make use of the reporting format guidance noted above when creating or requesting purchase orders. This will allow for better accounting and tracking for implementing partners while also allowing implementing partners to more easily evaluate different printing price options internally.
- Closely review purchase orders and identify any miscalculations. Develop a protocol of addressing rounding errors to ensure POs are accurate in the amount that implementing partners owe printers.

¹⁵ While it may not be possible to standardize a single template given that printers may use their own templates, ensuring that a standard collection of information is included will vastly improve the quality of future studies on this topic.

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Annexes

Annex A: Research Matrix

[Exhibit 13](#) provides a research matrix describing how data from the POs will be analyzed to respond to the research questions.

Exhibit 13: Research Matrix

Research Question	Analysis Plan
What is the average per-unit price and the per-unit price range of printing similar types of TLMs at the global and regional/sub-regional level?	All TLMs in the study were classified into one of five categories: big books, readers, student textbooks, student workbooks, teachers' read-alouds, and teachers' guides. The average price and price range for these different types of TLMs were calculated at a global, regional, and, if feasible without revealing the data source, sub-regional level.
What is the average procurement cost of each type of TLM (i.e., printing, shipping, customs and clearance, tax, and distribution)?	For those POs that include data on shipping, customs and clearance, tax, and distribution, these costs' contribution to the price of individual TLMs were calculated by distributing them proportionally across all TLMs included in the PO. Average prices and price ranges for all types of TLMs were recalculated at the global, regional, and sub-regional level based on these distributions.
What book and print order characteristics (e.g., quantity ordered, page count, cover weight) drive the per-unit price for TLMs?	For a subset of POs that included data on book and print order characteristics, data were entered into STATA 14.2 in order to explore the association between individual book cost and these variables. The Pairwise Correlation Coefficient was determined for each.

Annex B: List of Countries Included in Study

The countries where books included in this study were printed are listed below, separated by region. In regions where only one country was included, the country has been excluded so that price and cost data for a particular implementing partner cannot be identified.

- Central America: Only one country
- Central Asia
 - Afghanistan
 - Tajikistan
- East Africa
 - Djibouti
 - Ethiopia
 - Kenya
 - Rwanda
 - Uganda
- Europe: Only one country
- South Asia
 - Nepal
 - India
- Southern Africa: Only one country
- West Africa
 - Ghana
 - Liberia
 - Nigeria
 - Senegal
- West Asia: Only one country

Annex C: Examples of Purchase Order Details

Most purchase orders contained a table outlining the quantity and price of the books ordered. Unit price was frequently though not always clearly identified. An example of a typical quantity and price table is below.

Exhibit 14: Quantity and Price Details, Example

Title	Total Book QTY	Unit Price	Payment Amount	Due by
Title Example A	12,000	4.50	54,000	January 1, 2300
Title Example B	9,500	4.50	42,750	January 1, 2300
		Sub Total:	96,750	
		Transportation Cost:	20,500	
		Total Cost:	117,250	

Though it was less common, some purchase orders contained more specific details about the books ordered. An example of a physical specifications table included in purchase orders is below.

Exhibit 15: Physical Specifications, Example

Physical Specifications for TLMs																
No.	Title	Grade	Language	Copies of each Title	Illustrations	Font size	No of Pages	Format	Portrait / Landscape	Text colors	Text Material	Cover colors	Cover Material	Cover Finishing	Binding	Print Method
1	Title Example A	I	Local Language A	1150	Large size color full illustration in each page	40 pt.	25	A5	Portrait	Four-color	90 gsm art paper	Four-color	210 gsm, art card with UV	Laminated	Gummed and stapled	Offset CTP

Annex D: Description of Variables Used in the Analysis

Data	Type	Description
Binding Type	Interval	<ol style="list-style-type: none"> 1. Low Durability: Gummed, Saddle Stitch, Spiral 2. Medium Durability: Gummed and Stapled, Square Back and Glued 3. High Durability: Perfect (PUR, PUR with Sewing, and Stitching with Perfect Gluing), Thermal
Book Language	Categorical	<ol style="list-style-type: none"> 1. 1 language 2. 2 languages 3. 3 languages 4. 4+ languages
Book Title	Categorical	Data anonymized
Book Type	Categorical	<ol style="list-style-type: none"> 1. Big Book 2. Reader 3. Student Textbook 4. Student Workbook 5. Teacher Read-aloud 6. Teacher Guide
Copy Right	Categorical	<ol style="list-style-type: none"> 1. Copyright 2. Creative Commons
Country	Categorical	Data anonymized
Cover Type	Interval	<ol style="list-style-type: none"> 1. Least Durable: Coated and Offset Paper 2. More Durable: Coated Paper
Cover Weight	Continuous	
Currency	Categorical	Data anonymized
Grade	Categorical	<ol style="list-style-type: none"> 5. Grade 1 6. Grade 2 7. Grade 3 8. Grade 4+
Implementing Partner	Categorical	Data anonymized
In-Country Distribution Cost	Continuous	
Individual Book Price	Continuous	
Internal Color	Categorical	<ol style="list-style-type: none"> 1. One or two colors

Data	Type	Description
		2. Four colors
International Shipping	Continuous	
Length (cm)	Continuous	
Local Country Printing	Categorical	1. Yes 2. No
Method of Shipping	Categorical	1. Air 2. Land 3. Sea
Page Count	Continuous	
PO Year	Interval	
Printer Type	Categorical	1. Private 2. Public
Purchase Order Number	Categorical	Data anonymized
Quantity Ordered	Continuous	
Region	Categorical	1. Asia 2. Europe 3. Latin American and the Caribbean 4. Sub-Saharan Africa
Sub-Region	Categorical	1. Central Asia 2. South Asia 3. West Asia 4. Eastern Europe 5. Central America 6. East Africa 7. Southern Arica 8. West Africa
Total Area (cm)	Continuous	
VAT	Continuous	
Width (cm)	Continuous	

Annex E: Additional Data Tables

Exhibit 16: Average price, minimum price, and maximum price of TLMs, all prices in real 2019 USD (n=27,685,711)

	Big Books	Readers	Student Textbooks	Student Workbooks	Teachers' Read-alouds	Teachers' Guides
Asia						
Central Asia						
Average Unit Price	-	\$0.20	\$1.68	\$1.14	-	\$3.26
Minimum Price	-	\$0.17	\$0.72	\$0.53	-	\$1.93
Maximum Price	-	\$3.01	\$1.97	\$1.66	-	\$4.19
South Asia						
Average Unit Price	-	\$0.08	-	\$0.39	-	\$0.24
Minimum Price	-	\$0.08	-	\$0.15	-	\$0.08
Maximum Price	-	\$0.08	-	\$1.26	-	\$1.11
West Asia						
Average Unit Price	-	-	-	-	-	\$3.46
Minimum Price	-	-	-	-	-	\$1.98
Maximum Price	-	-	-	-	-	\$31.86
Europe (Eastern Europe)						
Average Unit Price	-	\$0.38	-	-	-	-
Minimum Price	-	\$0.38	-	-	-	-
Maximum Price	-	\$0.38	-	-	-	-
Latin American and the Caribbean (Central America)						
Average Unit Price	-	\$1.01	-	-	-	-
Minimum Price	-	\$0.88	-	-	-	-
Maximum Price	-	\$1.12	-	-	-	-
Sub-Saharan Africa						
East Africa						
Average Unit Price	\$7.05	\$0.85	\$1.76	\$0.61	\$7.57	\$1.23
Minimum Price	\$6.83	\$0.13	\$0.79	\$0.61	\$6.29	\$1.09
Maximum Price	\$7.27	\$12.21	\$1.85	\$0.61	\$9.83	\$2.36
Southern Africa						
Average Unit Price	-	-	-	-	-	\$1.92
Minimum Price	-	-	-	-	-	\$1.71
Maximum Price	-	-	-	-	-	\$2.15
West Africa						
Average Unit Price	-	\$0.86	\$1.43	\$1.05	\$0.95	\$3.35
Minimum Price	-	\$0.42	\$1.43	\$0.26	\$0.81	\$0.51

	Big Books	Readers	Student Textbooks	Student Workbooks	Teachers' Read-alouds	Teachers' Guides
<i>Maximum Price</i>	-	\$23.00	\$1.43	\$39.87	\$26.83	\$93.92
<i>Maximum Price (outlier removed)</i>	-	\$5.68	\$1.43	\$9.77	\$1.60	\$32.45

Note: High maximum prices in West Africa are the result of a single PO with extremely small order sizes (1–2 books per type). When this outlier is removed, maximum prices in West Africa are lower; however, average unit prices for all TLMs are the same except for readers, which reduce by one cent to \$0.85.

Exhibit 17: Quantities of TLMs ordered by type and sub-region (n= 27,685,711 TLMs)

Region	Big Books	Readers	Student Textbooks	Student Workbooks	Teachers' Read-alouds	Teachers' Guides
Asia	-	6,567,848	877,578	4,937,798	-	184,168
Central Asia	-	538,848	877,578	817,798	-	19,058
South Asia	-	6,029,000	-	4,120,000	-	149,600
West Asia	-	-	-	-	-	15,510
Europe (Eastern Europe)	-	24,000	-	-	-	-
Latin America and the Caribbean (Central America)	-	50,088	-	-	-	-
Sub-Saharan Africa	2,000	10,112,727	1,568,235	3,097,735	53,831	209,703
East Africa	2,000	9,146,583	1,506,735	2,400,000	13,250	73,342
Southern Africa	-	-	-	-	-	48,400
West Africa	-	966,144	61,500	697,735	40,581	87,961
Totals	2,000	16,754,663	2,445,813	8,035,533	53,831	393,871

Annex F: Suggested Study Purchase Order Template

[Exhibit 18](#) provides a potential template for some of the details to include if a purposeful cost of books study is developed.

Exhibit 18: Suggested Study Purchase Order Template

TLM Specifications																				
Type of TLM	Title	Grade	Language	Copies of each Title	Illustrations	Font size	No. of Pages	Format	Internal Paper Weight	Portrait / Landscape	Text colors	Text Material	Cover Colors	Cover Material	Cover Finishing	Cover Weight	Binding	Print Method	Individual unit price	

Transportation (Applicable for both international shipping and domestic distribution, broken up by shipment lot)							
Title(s)	Total Book quantity	Total weight of all books	Shipment Method	Origin	Destination	Shipping Cost	Customs and Clearance (for international shipping only)

The PO should also include space to capture any applicable taxes.