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September 7, 2026

Professors Emily Breza, Arun Chandrasekhar, and Davide Viviano
Workshop on Development Economics and Networks for Early-Career Researchers
National Bureau of Economic Research
1050 Massachusetts Avenue
Cambridge, MA 02138

Dear Professors Breza, Chandrasekhar, and Viviano,

I am writing to apply to the NBER Workshop on Development Economics and Networks for Early-Career Researchers, to be held in Cambridge, Massachusetts on December 5, 2026.

I am a development economist and McKenzie Research Fellow at the Melbourne Institute, University of Melbourne, currently on external leave from the World Bank, where I spent five years as an economist working on fiscal policy across Sub-Saharan Africa, Asia, and the Pacific. I completed my PhD in economics at the Australian National University in 2020 and hold a Master of Arts in International and Development Economics from Yale University. My research combines administrative data with large-scale field and survey experiments, usually embedded within government institutions, to study taxation, redistribution, and policy preferences in developing countries.

I propose to present my working paper “Who Benefits from Food Tax Exemptions in Lower-Income Settings? Evidence on Pass-Through and Incidence” (with Matias Strehl-Pessina, Ruggero Doino, Darian Naidoo, Kingtau Mambon, and Bobby Kunda). The paper uses the unanticipated removal of VAT on basic food items in Papua New Guinea to show that the local structure of retail competition—rather than statutory design—determines who benefits from this widely used policy: pass-through to prices is complete only in dense urban supermarket clusters and absent in the informal and rural markets where poorer households mainly shop, making the exemptions regressive in practice.

My application includes a curriculum vitae, a one-page statement of motivation and research interests, and the working paper. Should I be shortlisted, Pierre Bachas (Senior Economist, World Bank Development Research Group; pbachas@worldbank.org) could provide a recommendation.

Thank you for your consideration.

Sincerely,

Christopher Hoy

Who Benefits from Food Tax Exemptions in Lower-Income Settings? Evidence on Pass-Through and Incidence*

Christopher Hoy[abcd], Matias Strehl-Pessina[e], Ruggero Doino[b], Darian Naidoo[b], Kingtau Mambon[f] and Bobby Kunda[f]

7 September 2026

Abstract

Tax exemptions for basic items exist worldwide, typically justified by governments as a way to reduce the cost of living for poorer households. We study the unanticipated removal of consumption taxes on selected food items in Papua New Guinea by conducting a difference-in-differences analysis using administrative data, a supermarket price census, web-scraped online prices, and a nationally representative, household phone survey panel. We find complete pass-through in formal supermarkets in central urban districts, where retail competition is strong, but no pass-through in informal stores or rural areas, where poorer households mainly shop. Only 16 percent of the foregone revenue accrued to the poorest two quintiles, while the richest two quintiles and stores/wholesalers each captured almost 40 percent of the benefits. This degree of regressivity and variation in pass-through was unanticipated by 237 experts who participated in a prediction survey. Using a static MVPF-style comparison, we show that universal cash transfers would generate roughly two and a half times as much Q1-weighted value per fiscal dollar as the tax exemption. Our findings demonstrate that food tax exemptions are inherently regressive in lower-income settings, due to high informality, substantial market segmentation, and positive income elasticity of demand for basic food.

JEL Classification: H20, H22, H23, L11

Keywords: Public Finance, Industrial Organization, Taxation, Incidence, Pass-through

*We are thankful for funding from the World Bank Global Tax Program and the World Bank Pacific Observatory. We are grateful for comments from Anne Brockmeyer, Cain Polidano, Andrew Carter, and Tim Robinson, as well as seminar participants at the World Bank, University of Melbourne, University of New South Wales, Monash University, Australian National University, University of Papua New Guinea, and the Australian Department of Foreign Affairs and Trade. We are incredibly thankful to Maholopa Laveil, William Seitz, Barry Lei, Jennifer Balen, Cathy Philip, Boniface Aipi, Ishmel Libitino, Brent Jamma, Justin Hallett, Percy Tauni, Vaashal Mudaliar, and Lachlan Bruce for their support in gathering the data used in this study. [a] University of Melbourne, [b] World Bank, [c] Institute for Fiscal Studies, [d] Corresponding author (christopher.hoy@unimelb.edu.au), [e] UC Santa Barbara, [f] University of PNG. A replication package containing the code and data required to reproduce the results in this paper is available at https://reproducibility.worldbank.org/catalog/612.

1 Introduction

Food tax exemptions[1] are a major source of foregone revenue worldwide (Redonda et al., 2025) and are typically justified as a way to reduce the cost of living for poorer households (Thomas, 2024). The standard rationale for this policy is simple: exempting basic food items should reduce the tax burden on the poor (Warren, 2008). But in lower-income settings, this logic can fail for at least three reasons (Bachas et al., 2023; World Bank, 2022). Poorer households rely disproportionately on subsistence farming, many food purchases occur outside the tax net, and tax cuts may not be fully passed through to retail prices when stores face weak competition. As a result, the incidence of food tax exemptions depends not only on consumption patterns, but on whether households buy rather than produce their food, whether they buy from formal stores, and whether those stores face enough competition to pass tax changes through to prices. Yet despite the scale of the foregone revenue, there is very little empirical evidence about the extent to which these conditions exist in practice, and consequently, on how much food tax exemptions actually benefit poorer households in lower-income settings.

We study the pass-through to prices and the distributional incidence of introducing Value-Added Tax (VAT) exemptions, the most common form of consumption tax, in a lower-income setting. In 2025, the government of Papua New Guinea (PNG) introduced VAT exemptions for 10 basic food items,[2] providing retailers with only 12 days' notice before the change came into effect. This reform removed VAT on these items (keeping it in place for all other food items) for 19 months, at a cost of around USD 150 million. The setting in PNG mirrors that

[1] Consumption tax exemptions exist in the form of "zero rating", where input credits can still be claimed by the retailer, and pure exemptions, whereby input credits cannot be claimed resulting in cascading (Thomas, 2024).

[2] The 10 basic food items were: Cooking oil, Rice, Tinned fish, Tea, Flour, Tinned meat, Chicken, Noodles, Biscuits, and Coffee. There were three other non-food items, soap, diapers, and sanitary products, but these made up a very small fraction of the overall share of foregone revenue, and as a result, we do not focus on these items.

of many lower-income countries, with high informality, a largely rural, subsistence-based population, and VAT collection concentrated in the largest city. To estimate the causal effect of this unanticipated reform on prices, we use a difference-in-differences approach to compare price changes between exempt and non-exempt food items. We draw on detailed administrative data, a monthly panel of nationally representative household phone surveys, data scraped from websites, and a monthly census of prices across all formal supermarkets in the largest city. We also conduct a prediction survey of 237 experts, one of the largest to date[3], to compare our results with prevailing expectations.

We find very high pass-through of VAT exemptions to prices in formal stores in urban areas; however, there was no impact in informal stores or in rural areas. Nationwide, the average pass-through rate in formal stores was 64 percent within three months of the reform, and remained at this level for 12 months. There was full pass-through in formal stores in central districts of the largest city, and slightly lower but still substantial pass-through in formal stores in outer districts. The variation in pass-through rates is consistent with the level of competition between stores being a key mechanism driving the extent of price declines. The strongest competition is between supermarkets in central districts, where, on average, each supermarket is around 150 meters from its nearest competitor. Even stores within the same supermarket chains lowered their prices to varying degrees by location and whether they were selling in-store or online, with significantly higher pass-through in stores in central districts. In contrast, there is limited competition between stores elsewhere, especially in rural areas, where formal and informal stores exercise significantly greater spatial monopolistic power over prices.

We show that households in the poorest two quintiles received only 16 percent of the foregone revenue, whereas the richest two quintiles accumulated around 40 percent of the

[3]This study has a larger sample size than 95 percent of the studies listed on the Social Science Prediction Platform, the preeminent platform for expert prediction surveys (DellaVigna and Vivalt, 2025).

benefits. Poorer households do not benefit more from VAT exemptions because they purchase fewer basic food items (as they rely more on subsistence farming and consume fewer calories), and are more likely to purchase from informal stores and from stores facing less competition. In contrast, most households in central urban districts have higher living standards than those in rural areas (resulting in more food purchases), are more likely to shop at formal supermarkets, and benefit from greater competition between stores, leading to higher price pass-through. We decompose incidence and find that consumption patterns account for about two-thirds of the concentration of benefits among richer households, while heterogeneous pass-through across store types and locations accounts for the remaining third. We illustrate that even if there was a negative income elasticity for the exempt items (i.e., they were inferior goods) in line with the most extreme cases in higher-income countries (e.g., legumes), this would still not be large enough to offset the regressivity of VAT exemptions that is due to informality and competition.

Our analysis provides a simple framework for understanding the incidence of food tax exemptions in lower-income settings. The benefits of consumption tax relief depend on three margins: whether households buy the relevant items (rather than produce them themselves), whether they buy from formal firms (i.e., those inside the tax net), and whether those firms face sufficient competition to pass the tax change through to prices. This helps to explain why exemptions that may be perceived as a way to support poorer households can actually be highly regressive in practice.

These findings speak directly to a central public finance challenge in low- and middle-income countries: governments often rely on broad tax exemptions to provide relief to households, even when such policies are poorly targeted and costly. Our results show that the effectiveness of these tax expenditures depends not only on statutory tax design, but also on consumption patterns, informality, and local retail competition. This makes food VAT exemptions a weak substitute for social protection in settings where poorer households buy

less from formal, competitive markets. The results therefore have direct implications for the design of tax expenditures, tax reform, and compensation policies.

We illustrate the robustness of our findings in several ways. First, we show that our conclusions are consistent across four independent data sources, each with different strengths in coverage, timing (including monthly data series for over three years), and measurement.[4] Second, the credibility of our identification strategy is strengthened by the unanticipated nature of the reform, announced with only 12 days' notice during a period of political uncertainty, and by the absence of meaningful substitution between exempt and non-exempt items around the reform date.[5] Third, we rule out several alternative mechanisms, including showing that the observed variation in pass-through that we attribute to competition is not driven by differential pressure on stores.[6]

This paper makes two main contributions to the existing literature on the pass-through of taxes to prices and tax incidence. First, this is one of the first studies to causally examine the pass-through of VAT exemptions to prices in low- and middle-income countries. The vast majority of previous research on the pass-through of consumption taxes to prices has taken place in high-income countries (e.g., Benzarti et al., 2020; Benzarti and Carloni, 2019),[7] with only a few recent examples in slightly less developed settings such as Argentina (Benzarti et al., 2024), Mexico (Bachas et al., 2023), and India (Brusco and Velayudhan, 2025). Benzarti (2025) outlines how the frontier of research on this topic is understanding

[4]For example, we provide 18 months of pre-reform price observations, allowing us to comprehensively illustrate parallel pre-trends (joint Wald tests fail to reject the null of zero pre-treatment coefficients at any conventional significance level for each data source).

[5]Consistent with this, approximately 97 percent of phone survey respondents reported limited familiarity with the reform six months after implementation, suggesting that the policy did not induce changes in reporting behavior or purchasing patterns.

[6]The government did not invest meaningfully in monitoring whether stores lowered prices, no fines were issued, and the reform lacked a formal legislative basis. In addition, we show that variation in pass-through rates is not due to differences in store or product types; for example, there were no differences between chain and independent stores.

[7]In these settings, it is possible to collect broadly representative price data via supermarket scanners (Benzarti et al., 2024); however, this is not feasible in less advanced settings.

how exemptions impact prices in the short and medium term and how this varies across different settings. Our study offers new insights into this, as it covers a much longer time frame than previous work, and it is the first in a lower-income setting, characterized by high informality, substantial market segmentation, and a positive income elasticity of demand for basic food. In addition, understanding pass-through of VAT exemptions is particularly important in lower-income countries as they are the main form of assistance for poorer households, and misperceptions about their effectiveness can lead to underinvestment in alternative policies (e.g., social protection). Our results contrast sharply with expert expectations. In our prediction survey, experts substantially underestimated pass-through in competitive formal markets and overestimated it elsewhere, highlighting how easily the role of competition and market segmentation can be misjudged in lower-income settings.

Second, this study makes a substantial contribution by being the first to capture the economic incidence of VAT exemptions by observing actual purchases and consumption behavior across the household income distribution. This allows us to systematically decompose the incidence of VAT exemptions, showing how much informality, competition/market segmentation, and consumption patterns each contribute to regressivity. Past work has only indirectly examined this by using store-level price data and inferring differences across the distribution based on store type (Benzarti et al., 2024), or by examining household-level consumption from formal and informal stores without information on prices paid by households (Bachas et al., 2023). We also add to the broader, nascent literature on the incidence of taxation in lower-income countries (Jensen et al., 2024; Blasco et al., 2023), which includes work showing that alternative fiscal policies would be far more redistributive (Warwick et al., 2022; Inchauste et al., 2024). Our results on the economic incidence of food tax exemptions are also potentially relevant in higher-income countries, where fresh food is often sold in local, informal markets. The degree of regressivity we document was unanticipated by experts, who expected the benefits to be distributed evenly across the income distribu-

tion. This underscores how our results contribute to the existing knowledge base about tax incidence in lower-income settings.

The rest of the paper is structured as follows. First, we provide details about the setting and the VAT exemption reform. This is followed by information about the data and methodology. Next, we present the main findings about pass-through to prices and the incidence of the foregone revenue, including providing evidence about the mechanisms and the likely impact of alternative policies. Finally, we discuss the implications of the results and generalizability to other settings.

2 Background

2.1 Setting

The study is set in Papua New Guinea (PNG), which, in many ways, can be considered a typical lower-income country, despite its location in the East Asia and Pacific region. In 2024, PNG had a GNI per capita (Atlas Method) of USD 2,940, and 52 percent of the population lived below the extreme poverty line (USD 3 (2021 PPP) a day), making the country one of the poorest in the world outside of Sub-Saharan Africa (World Bank, 2026). There are very high levels of informality, with 85 percent of the population of over 10 million living in rural areas and primarily relying on subsistence agriculture (World Bank, 2026). Similar to many lower-income countries, there is one major economic urban center (Port Moresby), where most VAT is collected, and this city is home to most of the richest households in the country (Hoy et al., 2024; World Bank, 2026). Outside of Port Moresby, there are a small number of supermarkets in regional towns that are registered with the revenue authority, but most places that sell food items are informal, known as a "canteen" or "tuckerbox" (Pacific Data Hub, 2026). These informal stores typically lack an elaborate network of formal wholesale suppliers and often rely on a small number of informal distributors who purchase stock from

supermarket shelves in regional centers.

The patterns of food consumption in PNG reflect its level of development and its heavy dependence on subsistence agriculture. Households in the poorer quintiles typically have lower calorie intakes, which fall well below recommended levels (Schmidt and Yadav, 2026). Most households rely on starch and grains for the majority of their calories, which are primarily sourced from subsistence farming (Schmidt and Yadav, 2026). Only 17 percent of calories come from protein, fruit, and vegetables for households in the two poorest quintiles of the distribution, and this is marginally higher for the rest of the population (Schmidt and Yadav, 2026).

Consistent with prior work, our phone survey reveals three facts about how consumption varies across the income distribution in PNG. First, the volume of purchases of each food item increases across quintiles; as such, we do not detect any evidence of inferior goods[8] (see Figure A1 to Figure A7 in the Appendix for further details about consumption patterns observed in our phone survey).[9] Second, reliance on subsistence farming decreases across quintiles, with around two-thirds of consumption coming from households' own production for the poorest quintile, and this falls to around one-third for the richest quintile. Third, food purchases from formal stores increase across quintiles, with less than 20 percent made at formal stores in the poorest quintile, compared to over 40 percent in the richest quintile.

In general, these consumption patterns suggest that policies such as VAT exemptions, even on basic food items, are likely to be regressive: poorer households consume less food and purchase a smaller share of their food consumption. Beyond consumption patterns, the place of purchase also makes VAT exemptions more regressive, as poorer households rely more on informal stores and are more likely to reside outside of Port Moresby than higher-income households.

[8]We cannot rule out the possibility that some items that are primarily from subsistence farming may actually be consumed in a greater quantity by poorer households.

[9]Even cooking oil consumption is skewed towards the richer quintiles, albeit less so than for other goods.

2.2 VAT in Papua New Guinea

Papua New Guinea's VAT (locally called the Goods and Services Tax) is a broad-based consumption tax levied at a standard rate of 10 percent on most goods and services supplied domestically, as well as on taxable imports. Businesses with annual turnover above PGK 250,000 (approximately USD 70,000) are required to register for VAT. Registered firms can, in theory, claim credits for VAT paid on business inputs, so that the tax falls on final consumption. In practice, however, most small and medium sized firms remain outside the VAT net, and imported goods account for a substantial share of taxable consumption. These institutional features imply that changes in VAT rates will directly affect retail prices only for larger, formal stores (i.e., those operating within the formal VAT system), but may indirectly affect the prices of smaller, formal and/or informal stores. In addition, although zero-rating preserves input credits in principle, administrative frictions in claiming refunds and the high import content of many basic food items reduce the practical importance of distinguishing between zero-rating and exemption in this setting.

2.3 Details about the VAT exemption reform

For the first time in its history, the PNG government introduced VAT exemptions on 1 June 2025 for 10 food items. The intended aim of the reform was to ease the cost-of-living pressures on poorer households by lowering the prices of basic goods. Specifically, 10 food items became zero-rated for VAT, which had previously been levied at 10 percent. These items are: Cooking oil, Rice, Tinned fish, Tea, Flour, Tinned meat, Chicken, Noodles, Biscuits, and Coffee (see Figure A8 in the Appendix for the first official notice issued by the PNG Government). The expected annual cost to the government was nearly USD 100 million in foregone revenue, and at the time of writing, the exemptions were scheduled to remain in place for 19 months. As such, the PNG government estimates the total foregone revenue

to be in the order of USD 150 million. In practice, the zero-rating for VAT functioned like a pure exemption, as most exempt items are imported directly, resulting in minimal value added in the supply chain. No VAT is charged on the exempted items upon importation. To be eligible for the exemption, the food items must have been imported on or after January 1, 2025.

The announcement of the VAT exemption reform was particularly abrupt, and efforts to pressure stores to pass through VAT cuts to lower retail prices were minimal, especially in the first 10 weeks of the reform. The PNG government first publicly stated in late November 2024 the possibility of removing VAT from some basic items in mid-2025, but the details were limited, and its credibility was unclear (see details about the timeline of the reform and the data sources we draw on in Table A1 in the Appendix). Then, on 19 May 2025, policymakers announced that effective June 1, 2025 (i.e., 12 days later), VAT exemptions would be implemented for the 10 food items outlined above. This gave stores almost no time to raise prices in anticipation of the reform. There was also no legal basis for the government to require stores to lower their prices, such as by fining stores for noncompliance (i.e., no legislation was passed, and the parliament was suspended for an open-ended period). There was also ambiguity about which government agency, the revenue authority (IRC) or the competition agency (ICCC), was responsible for monitoring. Rather, the PNG Government relied on a series of public announcements to try to pressure stores to fully pass through the VAT reduction to prices. In light of the ambiguity surrounding this reform, the PNG Government issued an updated public notice on 8 August 2025 (see Figure A9 in the Appendix). This provided more details on the VAT exemptions, including how policymakers planned to monitor the reform. However, the legality of these adjustments was unclear, as no law had been passed by parliament, and there was no mechanism to actually fine stores for non-compliance.

3 Methodology

3.1 Data

There are two main types of price data that we draw on for this study. One focuses on prices at formal supermarkets in Port Moresby, PNG's largest city. The other measures household consumption data, both expenditure and quantities, throughout the country. Before providing details about each data source individually, we provide a brief summary.

3.1.1 Summary of data sources

Table 1 compares these four data sources in terms of their coverage, unit of analysis, types of stores covered, key strengths, and main limitations. Details about the timing of the collection of each data source are presented alongside the timeline of the reform in Table A1 in the Appendix. The monthly supermarket census provides price data for 20 items from the universe of formal supermarkets in Port Moresby, allowing us to compare pass-through across the city; however, as the timing of the reform was unanticipated, data availability for the pre-reform period is limited. In contrast, the administrative data includes price information for over 100 items over a two-year period, but only from a subset of formal supermarkets in Port Moresby. The scraping of websites provides price information for over 500 items in the weeks leading up to and following the reform; however, this only covers the two supermarket chains that offer online shopping. Finally, the monthly phone survey panel captures price information from a nationally representative sample of households, covering both formal and informal stores, and allows us to conduct a decomposition of incidence; however, the data is self-reported and consequently more noisy than the directly observed price data. Taken together, we view the four data sources as complementary and, combined, we believe they provide a rich picture of how the VAT-exemption reform affected prices; however, each source on its own has limitations.

Table 1: Summary of data sources

	Supermarket census	**Administrative data**	**Scraping of websites**	**Phone survey panel**
Location	Port Moresby	Port Moresby	Port Moresby	Nationwide
Unit	Store	Store	Store	Household
Store type	Formal	Formal	Formal	Formal + Informal
Coverage	All	Subset	All online	Representative
Frequency	Monthly	Monthly	Weekly	Monthly
Exempt items	10	10	10	8
Non-exempt items	10	129	479	8
Time period	May-Nov 25	Dec 23 - May 26	May-Aug 25	Oct 23 - May 26
Strengths	All formal stores	Multi-year	All products	Consumption data
Limitations	Limited pre-trends	Non-representative	Only two chains	Self-reported

Notes: This table summarizes the four data sources used in the analysis. Location refers to geographic scope. Unit refers to whether the data covers stores or households. Store type refers to whether the data sources cover just formal or formal and informal stores. Coverage refers to whether the data source captures the universe of relevant outlets or a subset. Frequency refers to how often the data was collected. "Exempt items" and "non-exempt items" denote the number of treated and comparison-group product categories used in each source. Time period refers to the period for which this data source was collected. In the case of the scraped website data, there are 97 specific products within the broader 10 exempt food item categories.

3.1.2 Price data in Port Moresby

The three main sources of price data in Port Moresby are a monthly supermarket census, detailed administrative data, and information scraped from supermarket websites.

Monthly census of supermarkets in Port Moresby

For this study, we collected price data through direct observation in-store by an implementation team, covering all 83 formal supermarkets in Port Moresby between May and November

2025. The team first compiled a comprehensive store list by scraping publicly available online information (primarily from social media) on store presence and locations in Port Moresby. This produced an initial list of roughly 250 distinct buildings (excluding informal vendors operating from carts or selling on the ground). The team then verified each location through in-person visits, which led to substantial revisions based on whether the site still operated as a retail outlet selling a broad set of food items that became VAT-exempt under the reform. We also excluded locations where prices were not clearly posted and instead had to be obtained by asking a seller, since such prices may reflect negotiation rather than the posted prices faced by all consumers. During fieldwork, a small number of additional stores without an online presence were identified and added to the list when they clearly operated as formal supermarkets.

This listing exercise resulted in the inclusion of 83 supermarkets, which we understand to constitute the universe of formal supermarkets in Port Moresby that sell at least some of the newly exempt items and for which retail prices are directly observable.[10] Based on our engagements with PNG government officials, we understand that each of these supermarkets is registered for tax purposes. Figure 1 maps their locations, distinguishing stores in close proximity to competitors (red) from more remote stores; proximity is measured using the Ahlfeldt–Redding–Sturm–Wolf proximity score (Ahlfeldt et al., 2015). On average, high-proximity stores are approximately 150 meters from their nearest competitor, and all high-proximity stores are located within a central area of less than 2 km^2 in Port Moresby.

The implementation team collected monthly price data from each supermarket for 20 food items: 10 items that became exempt and 10 used as a comparison group (see Section 3.2 for details). To ensure comparability, a specific product was selected to capture the price changes for each item, such as 100g of the most common brand of tea. The selection of these

[10]There were significant discrepancies in the data for three of these supermarkets, and consequently, we remove them from our analysis. The inclusion of these three supermarkets does not change our qualitative results.

specific products was an iterative process during the listing exercise, based on the availability in each store. In most instances there are only around 4-6 specific products that fall into a given food item category (e.g., six types of tea are sold, whereby there are two brands with three different quantities each). When the specific product was not available in a store at the time of price observation, information about the closest alternative was captured, such as 50g of the same brand of tea, and this deviation was noted during data collection. In practice, product variety within each food item is limited, and prices are typically proportional to quantity (i.e., a constant unit price, so 100g of tea costs about twice as much as 50g). As a result, even when we recorded prices for close substitutes, these observations still provide informative evidence on the magnitude of price changes as they were standardized to common units. The data collection process was closely monitored, with monthly random checks to verify that the implementation team was accurately recording prices.

Detailed administrative data

We draw on two separate administrative data sources that monitor supermarket prices in Port Moresby: one collected by the Consumer Price Index (CPI) team at the PNG National Statistics Office (NSO) and the other by the research team at the Central Bank of PNG (BPNG). This microdata is used by the NSO and BPNG to produce regular estimates of the CPI and Retail Price Index (RPI). Both data sources contain extensive price data for over 100 food items (with various specific products within a food item, such as four different types of chicken) from a small number of supermarkets, collected monthly from 2023 to 2026. The administrative data sources are an ideal complement to the supermarket census: the former covers a much larger set of products over a longer period, while the latter captures the universe of supermarkets in Port Moresby. The NSO and BPNG data are collected by separate teams of trained enumerators, many of whom have been involved in this process for several years. The two organizations work completely independently and do not share their

microdata on supermarket prices with each other. In fact, the NSO and BPNG compete to collect the highest-quality price data to help inform the government's decision-making, particularly the appropriate level of interest rates.

Data collected from scraping supermarket websites

We assemble a weekly panel from May to August 2025, comprising all online prices for food products from the two supermarket chains that offer online shopping in PNG (RH Hypermarkets and FoodPro PNG).[11] Each observation records product name, product category, product code, price, and extraction date. Using the data from all weekly website scrapes, the unbalanced panel contains 7,779 observations covering 576 specific products. Of these specific products, 97 were exempted because they fall under one of the 10 food items subject to the VAT exemption reform (rice, wheat flour, instant noodles, biscuits, tinned fish, tinned meat, chicken, cooking oil, coffee, tea). To avoid products entering or exiting over time, we restrict our focus to a balanced panel, defined as products present every week during the data collection period. This restriction yields 7,588 observations, covering 542 specific products, of which 94 were exempted. However, the key patterns remain largely unchanged whether the balanced or unbalanced panels are used. It is important to note that only RH Hypermarkets has a chain of in-person stores and an online shopping option. FoodPro PNG operates solely online and supplies some other supermarkets and retail outlets (e.g., Buffalo Burger). A third chain, Stop and Shop, which had offered online shopping during the COVID-19 pandemic, left the online market within a couple of years.

[11] As a robustness check we use a "time machine" web application to examine prices prior to May 2025 and do not observe any abrupt changes in prices in the previous 12 months.

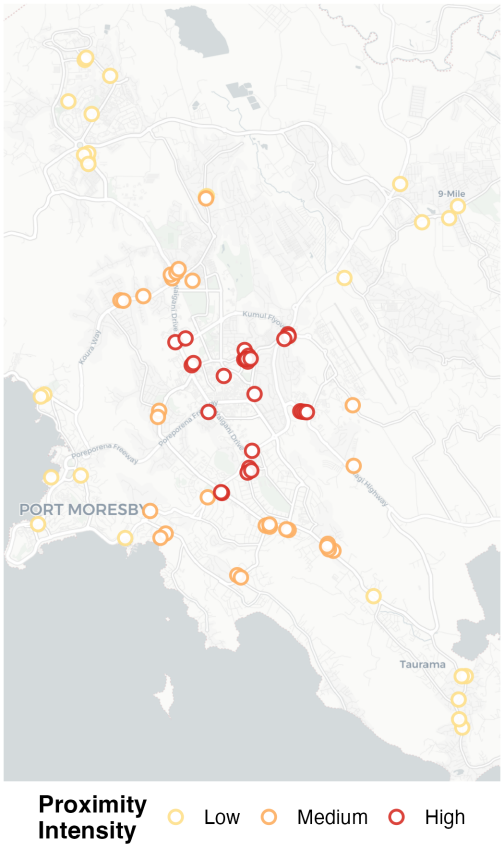


Figure 1: Map of Port Moresby with supermarket locations

Notes: This figure maps the 83 formal supermarkets included in the Port Moresby supermarket census. Marker shading indicates stores' proximity to competitors, based on the Ahlfeldt–Redding–Sturm–Wolf proximity measure, with darker markers denoting greater local competitive intensity. High-proximity stores are concentrated in central Port Moresby.

3.1.3 Consumption data across Papua New Guinea

The consumption data (both expenditures and quantities) used for this study were sourced from a monthly panel phone survey of approximately 1,000 households, which are broadly representative of the PNG population. The panel survey ran for almost three years from the end of 2023 to mid 2026 and was implemented by the largest telecommunications company in the region (Digicel), with technical and quality oversight provided by the World Bank.

The first phase of the phone survey was conducted in a repeat cross-sectional manner from 2021 to 2023, using random digital dialing and quotas for the over 1,000 operational telecommunication towers. This ensured the sample was broadly representative of the population and that respondents participated from each of the 22 provinces across the country. In the second phase, the survey transitioned to a panel, where the sample was a random selection of respondents who had previously participated in the first phase, with strata defined by location. This led to a sample of respondents that was still broadly representative of the PNG population and located in each province (see Figure 2). In the Appendix, we provide more details about the representativeness of the sample of respondents (see Table A2). Since the start of 2024, around 1,000 respondents have participated monthly in this phone survey, though some did not participate every month. As a robustness check, we rerun our main analysis with a purely balanced panel and do not find any meaningful differences in the results compared to the unbalanced panel.

Phone survey respondents were asked about their consumption over the previous month, including any purchases of 20 items (18 of which were food), 8 of which were subject to the VAT exemption reform.[12] These questions captured information about the item purchased, the location, the quantity (in standard measurement units), and the expenditure. For example, they were asked if they had purchased any rice, and if so, how many kilograms, how much they spent, and from which type of store. Importantly, the information captured on the type of store where the purchase occurred is comparable to what is used in Bachas et al. (2023), which allows us to distinguish between formal supermarkets and informal "stores"—typically called "canteens" or "tuckerboxes" in PNG.

[12]The number of food items they were asked about expanded in early 2025. Our main results do not change meaningfully if we exclude the newer items from our analysis. In the survey instruments, tinned meat was described as "tinned beef"; figures based on the survey data retain that wording, while the text follows the government notice in referring to "tinned meat".

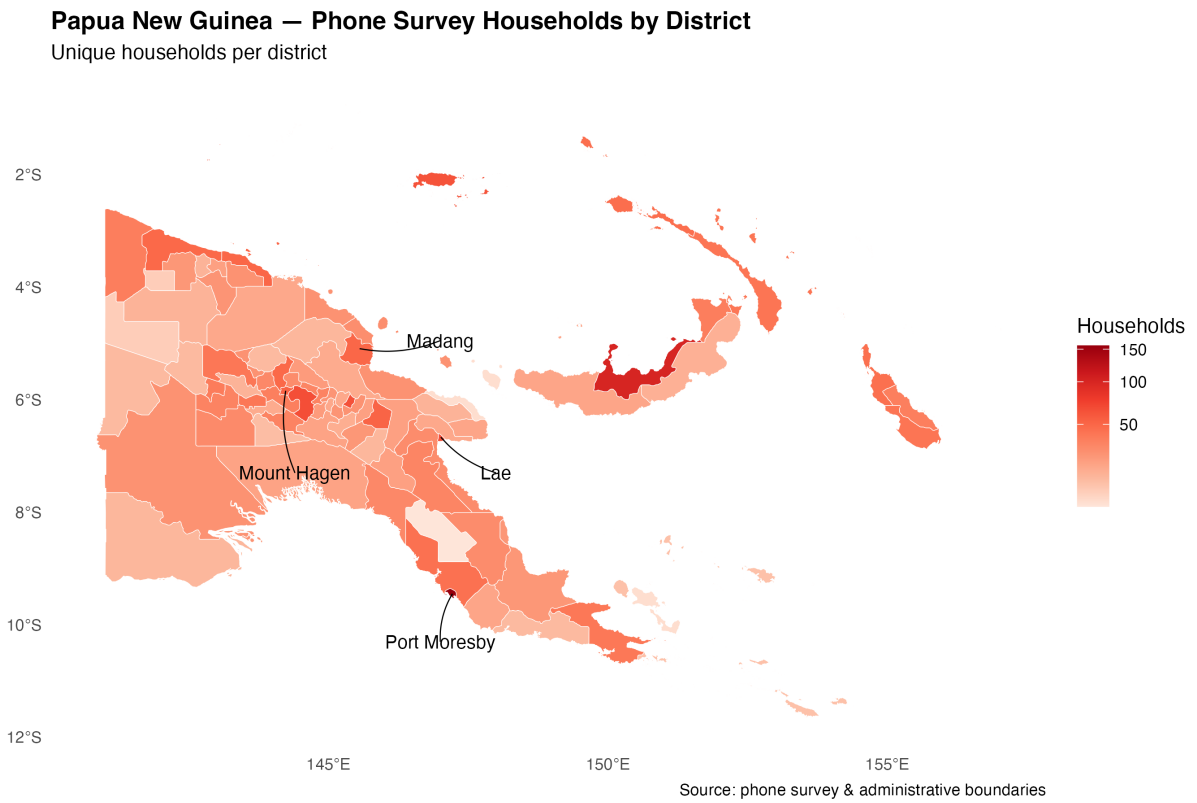


Figure 2: Map of Papua New Guinea with respondents' locations

Notes: This figure maps the geographic distribution of households in the monthly phone survey panel. Shading indicates the number of unique respondent households observed in each district over the sample period. The figure illustrates the survey's broad national coverage.

A potential limitation of relying on self-reported data is that we assume the VAT exemption reform does not influence respondents' recall of the expenditures and the quantity purchased. To check whether this could be an issue, we asked respondents about their awareness of the reform six months after its implementation. Around 97 percent of respondents stated that they were not very familiar with the VAT exemption reform (see Table A3 in the Appendix). This makes it unlikely that the reform induced misreporting. Moreover, most respondents had answered the same food-purchase questions more than 20 times prior

to the reform, since these items were included in phases one and two of the phone survey. Respondents were therefore highly familiar with the questions, and it is reasonable to expect that they interpreted and answered them similarly before and after the reform.

3.2 Empirical analysis

To estimate the pass-through of the VAT-exemption reform to prices, we implement a difference-in-differences design that compares changes in prices for VAT-exempt food items to changes for a comparable set of food items that remained subject to VAT. This approach, which focuses on a single sharp reform date, remains robust to recent critiques of difference-in-differences designs and is consistent with other seminal studies on pass-through of reforms to prices, such as Benzarti et al. (2024). Selecting an appropriate set of items to estimate the counterfactual price trends is a key practical challenge. In particular, we need to avoid choosing items that are near-perfect substitutes for the exempt items, since the reform could induce substitution in consumption and thus generate second-round effects on prices (e.g., see Minton and Mulligan, 2024). In our data, however, we do not detect meaningful changes in consumption patterns following the reform, suggesting that this concern is unlikely to be important in our setting.

We adapted the exact composition of items in the comparison group based on what was feasible for each data source. In the case of the supermarket census, we used 10 other food items that were available across supermarkets in Port Moresby, for which the administrative data suggested that the change in price was similar to that of the exempt items over the year prior to the reform.[13] In the phone survey data, we restricted our focus to items purchased by at least 50 respondents each month to minimize the risk of outliers or measurement issues impacting our results. By doing so, we reduced the number of items in the exempt

[13]Those are: Butter, Kaukau (sweet potato), Tinned baked beans, Broccoli, Sugar, Sausages, Powdered milk, Breakfast cereal, Bananas, and Milo.

and comparison groups to eight each.[14] In the administrative data, the comparison group consisted of prices for a subset of packaged food items collected by the NSO and BPNG, which were similar to the comparison group items included in the supermarket census. Each organization provided slightly different comparison groups with a larger number of food items than the supermarket census, but removing these additional items did not qualitatively change our findings. Finally, for the web scraping data, the comparison group consisted of all food items available online that were not exempt from the VAT reform.

Our empirical specification is given by:

$$Y_{sit} = \sum_{\tau \neq \text{May 2025}} \beta_\tau \left(D_i \cdot \mathbf{1}[t = \tau] \right) + \mu_s + \lambda_i + \gamma_t + \varepsilon_{sit} \tag{1}$$

where Y_{sit} is the tax-inclusive price of item i in store s at time t, normalized to 1 in May 2025. $D_i \in \{0, 1\}$ is a time-invariant indicator equal to 1 if item i received a VAT exemption in June 2025. β_τ captures the differential price change for treated items in period τ relative to the May 2025 baseline. μ_s, λ_i, and γ_t are store, item, and time fixed effects, respectively. The set of fixed effects included varies by data source: μ_s only in the supermarket census, λ_i only in the phone survey and administrative data, and both μ_s and λ_i in the web-scraped data.

In addition to the monthly coefficients β_t, we report a summary measure of the average post-reform effect. This is the simple average of the post-reform event study coefficients, $\bar{\beta} = \frac{1}{T_{\text{post}}} \sum_{t > \text{May 2025}} \hat{\beta}_t$, which places equal weight on each post-reform month.

Our difference-in-differences design relies on two main identifying assumptions. First, we assume that the introduction of VAT exemptions was not anticipated by firms or consumers. This assumption is plausible given the institutional context: the policy was announced with only 12 days' notice, in the midst of an extended parliamentary suspension due to a pending

[14] The exempt items were: Cooking Oil, Rice, Tinned fish, Tea, Flour, Chicken, Noodles, Biscuits. The comparison items were: Kaukau, Aibika, Sugar, Sausages, Bananas, Butter, Milo, Phone credit.

no-confidence motion, which could have led to the dissolution of the current government. This meant there was no public debate, no amendments to the two-decade-old VAT legislation, and no legislative signaling in advance of the reform. As such, there was limited scope for preemptive price adjustments or inventory management. Consistent with this, we find no evidence of differential pre-reform price trends between exempt and non-exempt products. Furthermore, the PNG government did not announce and implement a plan to monitor the reform until August 2025 (i.e., more than two months after the VAT exemptions came into effect). In fact, very few policymakers, including in the revenue authority and competition agency, were even aware of the VAT exemption reform before the PNG Treasurer's public announcement on 19 May 2025.

Second, we assume that non-exempt food items serve as valid counterfactuals for exempt items in the absence of the policy change. This requires that the reform did not induce differential demand shifts or substitution between exempt and non-exempt products that would, in turn, affect prices. We show that average expenditure on exempt and non-exempt items remain stable around the reform date, and our results are robust to restricting the control group to close substitutes and to alternative product groupings (see Figure A10 and Figure A11 in the Appendix for details). In fact, each of our four data sources uses different items for the comparison group, and we find very similar results. Furthermore, around 97 percent of respondents to the phone survey were not very familiar with the reform six months after its implementation (see Table A3 in the Appendix), suggesting that most consumers were not changing their purchases as a result of the reform.

4 Results

4.1 Pass-through of VAT exemptions to prices

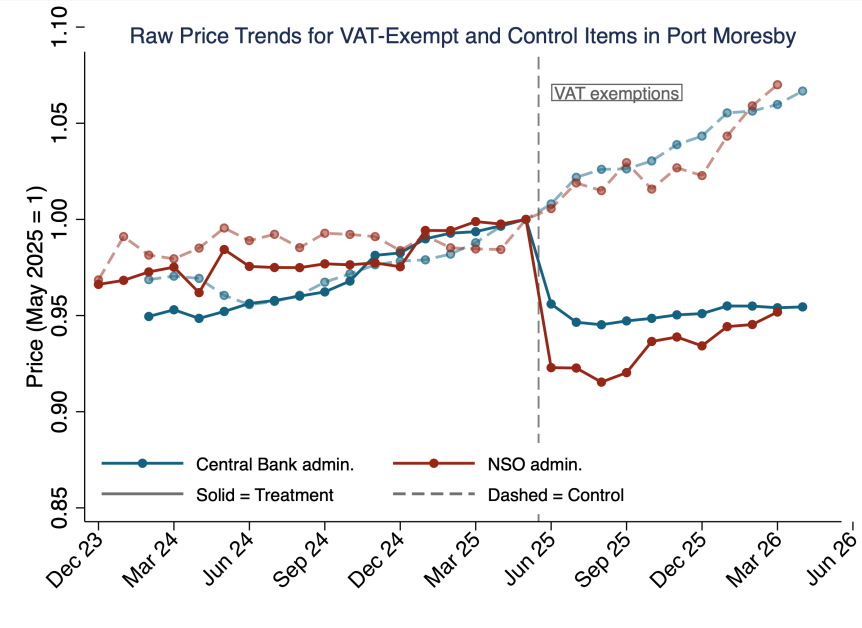
4.1.1 Overall levels of Pass-through in Port Moresby

To show the overall levels of pass-through in Port Moresby, we draw on two independent, administrative data sources for our empirical analysis of pass-through in formal supermarkets. Understanding pass-through to prices in Port Moresby is particularly important as it is the country's main economic center and where around 70 percent of VAT is collected. Both data sources track prices of the same products in the same supermarkets for the year and a half leading up to and for a year following the reform. Figure 3 shows, for each data source, the raw price trends in Panel (a) for VAT-exempt food items ("treatment") and the comparison group ("control"), normalized to 1 in May 2025, along with the difference-in-differences estimates in Panel (b) based on Equation 1.

We find near-complete, immediate pass-through of the VAT exemption to prices across both data sources, and this persists for a year following the reform. Panel (a) of Figure 3 shows the raw trends with prices in the treatment and control groups increasing steadily in the 18 months prior to the reform, and prices in the treatment group immediately fell considerably following the introduction of VAT exemptions, but continued to increase in the control group. Panel (b) of Figure 3 shows the corresponding difference-in-differences estimates, comparing price changes in the treatment and control groups, suggesting at least a five percentage point immediate effect on prices in the first month, and this reaches near complete pass-through[15] within three months across both data sources and persists for a year following the reform. We also see similar results in Figure A12 and Figure A13 in the Appendix based on aggregate NSO data using the CPI, prices for all food items, and prices for items in the control and treatment groups over the last 14 years.

[15]The removal of a 10 percent VAT is equivalent to a 9.1 percentage-point price reduction.

(a) Raw trends



(b) Difference-in-differences results

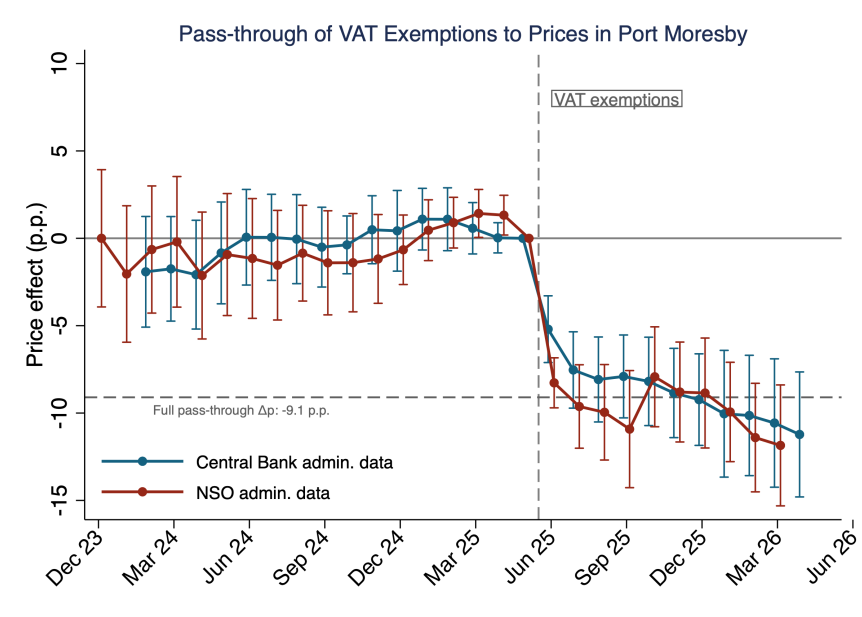


Figure 3: Pass-through of VAT exemptions to prices in Port Moresby by data source

Notes: Panel (a) plots normalized price indices for VAT-exempt (treatment) and non-exempt (control) items by data source, with prices scaled to equal one in May 2025. Panel (b) reports difference-in-differences estimates of the price effect of the VAT exemption reform, relative to May 2025. Estimates are based on Equation 1. The vertical line marks the introduction of the VAT exemptions on 1 June 2025, and the horizontal reference line denotes full pass-through of a 10 percent VAT removal. Vertical bars show 95 percent confidence intervals.

The observed pre-reform dynamics strengthen our confidence that price changes in the control group provide a reasonable proxy for the counterfactual evolution of treatment-group prices absent the reform. We conduct a joint Wald test of the null hypothesis that all pre-treatment coefficients are zero. For the BPNG administrative data, we obtain a Wald statistic of $\chi^2(15) = 2.36$ ($p > 0.99$), and for the NSO administrative data, $\chi^2(17) = 2.41$ ($p > 0.99$). In both cases, we comfortably fail to reject the null at any conventional significance level. As such, not only are the differences in pre-trends between prices in the treatment and control groups close to zero, they are also statistically insignificant. This is not surprising, given that in the absence of shocks, food prices tend to rise steadily over time. A similar counterfactual was used in other studies, such as Benzarti et al. (2024).

Taken together, Figure 3 indicates near-complete pass-through of the VAT exemption to prices in supermarkets in Port Moresby, while the pre-trends analysis provides supporting evidence for the parallel trends assumption. The fact that two independent data sources yield consistent patterns provides compelling evidence for this conclusion.

4.1.2 External Validity, Heterogeneity and Mechanisms in Port Moresby

Building on the analysis of the overall level of pass-through to prices in Port Moresby and to explore heterogeneity and mechanisms, we draw on a census of all formal supermarkets in the city. This dataset covers the majority of purchases of food items from formal stores that became VAT-exempt in PNG during a six-month period around the time the reform was implemented.[16] This complements the administrative data sources, which are based on a subset of formal supermarkets in Port Moresby that may not be representative. We find near identical overall patterns in pass-through based on the supermarket census as what we

[16] As the census data was collected for the purposes of this study, and as the reform was unanticipated, it only includes prices from the month prior to the VAT reform. This prevents us from assessing pre-trends with this data alone. However, the administrative data track prices of the same products in a subset of supermarkets in Port Moresby for the year and a half leading up to the reform, and they show no evidence that the parallel trends assumption is invalid.

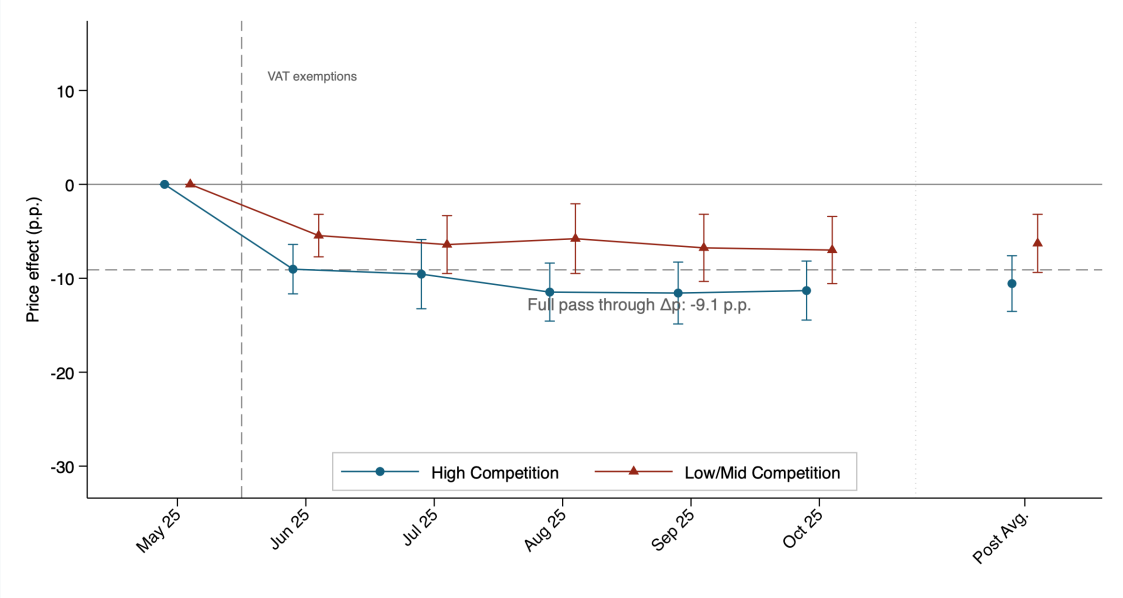
report in the administrative data analysis in the previous subsection (see Figure A14 and Figure A15 in the Appendix). The fact that we find similar results reassures us that the patterns we observe are not due to the selection of supermarkets in the administrative data.

Analysis of heterogeneity in pass-through rates among formal supermarkets in Port Moresby shows that an important mechanism driving these results is the role of local competitive conditions. Pass-through is substantially higher in supermarkets located in central Port Moresby, where competition is more intense. Figure 4 presents the difference-in-differences estimates disaggregated by stores' proximity to competitors, along with the distribution of store-level pass-through rates, and compares differences in pass-through within the same chains.

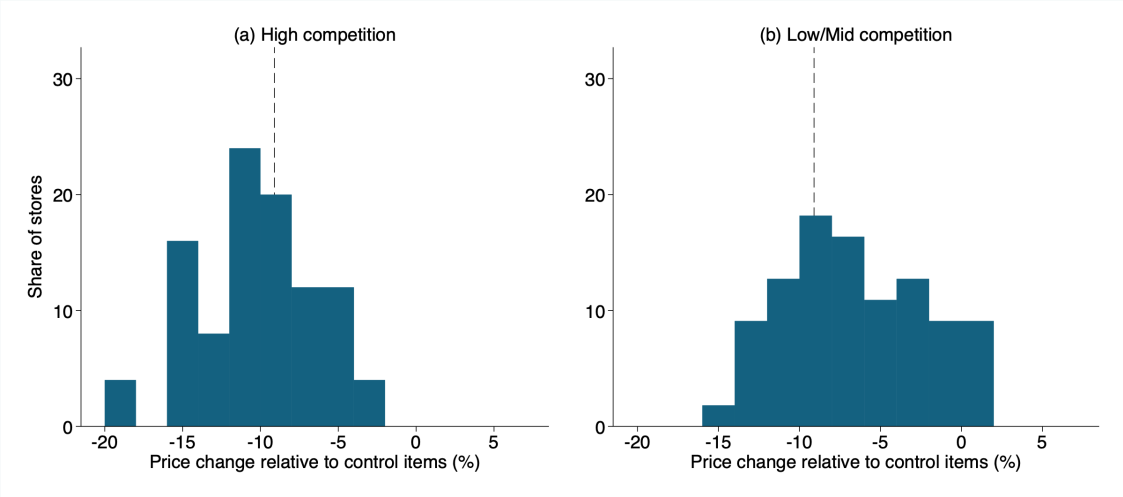
Panel (a) shows that supermarkets with high proximity to competitors — defined as located within the central districts of Port Moresby, where, on average, supermarkets are within 150 meters of their nearest competitor — exhibit immediate full pass-through that is sustained over time. In contrast, pass-through is initially around two-thirds among stores with lower proximity to competitors, and remains below full pass-through even four months after the reform. The differences in pass-through between these store types are weakly statistically significant when examining the average across the post-reform period.

Panel (b) depicts the distribution of store-level pass-through rates three months after the reform for stores facing high competition (i.e., those with high proximity to competitors) and those that do not. Differences are evident not only in average pass-through, but also in the tails of the distribution. For instance, roughly one-quarter of low-competition stores have pass-through rates below 30 percent, whereas every store in a high-competition area has a pass-through rate above 30 percent. These differences are not driven by whether stores are independent or part of a chain (see Section 4.4 for more details).

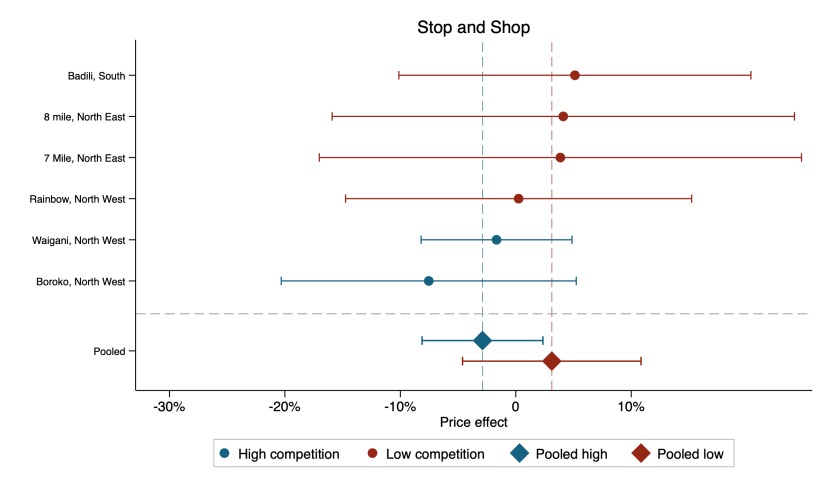
(a) Difference-in-differences results by proximity



(b) Distribution of pass-through rates



(c) Differences in pass-through within the largest supermarket chain



(d) Differences in pass-through online vs in-store

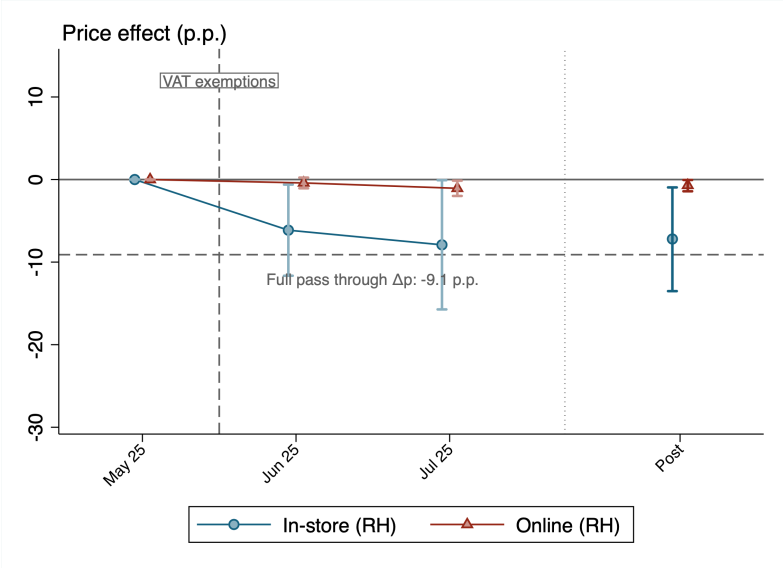


Figure 4: Heterogeneity of pass-through based on level of competition

Notes: This figure examines heterogeneity in pass-through by local market competition using the supermarket census data. Panel (a) reports difference-in-differences estimates separately for stores in high-competition and low/mid-competition areas. Panel (b) shows the distribution of store-level pass-through rates three months after the reform; the left histogram corresponds to stores in high-competition areas and the right histogram to stores in low/mid-competition areas. Panel (c) compares pass-through across stores within the largest supermarket chain, and Panel (d) compares online and in-store prices within the same chain. In Panels (a) and (d), the vertical line marks the reform date, and the dashed horizontal line indicates full pass-through of the VAT removal.

Panel (c) shows these patterns hold even within the same chain. There is higher pass-through in high-competition areas across stores within the largest supermarket chain, Stop and Shop. On average, pass-through in the two stores in central Port Moresby is around 70 percent. In contrast, there is effectively zero pass-through in the four stores elsewhere in the city. The difference between the pooled results comparing stores between high and low competition areas is highly statistically significant.[17] These results are noteworthy, given the market share of this supermarket chain; it had a greater ability to influence the price than other stores and was clearly still subject to competitive pressures in central Port Moresby.

Panel (d) shows that there were also substantial differences in pass-through within the same chain between their online and in-store prices.[18] Within the same chain, RH Hypermarkets, there was almost complete pass-through to in-store prices, but no price reductions for online customers. This supermarket chain has far greater market power online; there are only two options, and RH Hypermarkets has around five times as many products available as the other option, whereas there is far more competition for its stores, which are located in central Port Moresby.

Further evidence of competitive pressures is provided by a business sentiment survey conducted by the central bank, which interviews the same 100 formal retail stores every six months. In 2025, over 90 percent of these stores in Port Moresby reported passing on cost changes to consumers, compared to less than 80 percent elsewhere (Figure A17). In addition, stores in Port Moresby were much more likely to report increases in competition throughout 2025 (Figure A18). While these results are only suggestive, they are consistent with formal stores in Port Moresby being largely price takers due to competition; consequently, when their costs fell due to the reform, they passed this on to consumers.

[17] It is notable that at the time of the reform, this supermarket chain advertised that it was lowering prices on exempt items to attract customers from competitors (see the example in Figure A16 in the Appendix).

[18] For this analysis, we ignore any delivery fees that online customers may face.

4.1.3 Pass-through to prices nationwide

We now turn to the nationwide pass-through of the VAT reform, drawing on the phone survey data. These estimates are noisier than those from other data sources, as they rely on self-reported data. They still clearly indicate that the pass-through of VAT exemptions to prices was substantial in formal stores in urban areas, but it was far more limited in informal stores and in formal stores in rural areas. The average difference-in-differences estimates over the entire 12-month post-reform period are presented in Table 2, including results disaggregated by store formality and by rural versus urban location. The average effect on prices in formal stores nationwide is 5.8 percentage points, which suggests a pass-through rate of 64 percent. The pass-through rate is over 80 percent in formal stores in urban areas (7.3 percentage points). In contrast, there are minimal effects in rural areas and in informal stores.

Table 2: VAT pass-through estimates (p.p.)

Pass-through, p.p.	(1)	(2)	(3)	(4)	(5)
Treatment	-3.1	-0.9	-0.0	-1.0	-1.0
	(3.1)	(2.6)	(3.8)	(2.5)	(2.5)
Treatment × Formal	—	-4.9	-7.3*	-1.3	-1.2
		(3.9)	(4.3)	(3.3)	(3.3)
Treatment × Urban	—	—	—	—	1.2
					(2.9)
Treatment × Formal × Urban	—	—	—	—	-6.7*
					(3.9)
Specification	Post	Post	Post	Post	Post
Coverage	All	All	Urban	Rural	All
N	129,921	129,921	43,725	86,196	129,921

Notes: Coefficients are in p.p. of price change for VAT-exempt vs. control items. Prices are normalized to item-specific May 2025 means. Post is the simple average of post-reform event-study coefficients from June 2025 to May 2026. Full pass-through corresponds to −9.1 p.p. Formal is based on the store type where the purchase occurred. Conventional standard errors are clustered at the product level and include the standard finite-sample correction. Significance stars are based on wild-cluster bootstrap p-values. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Figure A19 in the Appendix reports the dynamic, monthly difference-in-differences estimates (based on Equation 1), which mirror these patterns. Pass-through reaches over 60 percent in formal stores within three months of the reform. However, there is considerable variation for each monthly estimate, which is partly to be expected given the self-reported nature of the data.[19] We conduct a series of analyses to assess the robustness of the pre-trends and conclude that the data still exhibit meaningful variation informative about the reform. Joint Wald tests of the null that all pre-treatment coefficients equal zero fail to reject at any conventional significance level across all panels of Figure A19, with p-values ranging from 0.96 to 0.99. However, we note that the phone survey estimates are considerably less precise than those from the administrative data, and the failure to reject is driven primarily by wide confidence intervals rather than tightly estimated pre-treatment coefficients near zero. We therefore interpret the phone survey results with appropriate caution, treating them as complementary to, rather than a substitute for, the more precise estimates from the administrative data and supermarket census.

4.2 Incidence of VAT exemptions

4.2.1 Estimating the incidence

The incidence of VAT exemptions across the income distribution is determined by the interaction of households' consumption patterns and realized pass-through to prices. As discussed in Section 2, households in richer quintiles purchase more basic food items than poorer households, including each of the items that became VAT-exempt, reflecting lower reliance on subsistence farming and higher overall consumption. In addition, richer quintiles pay prices that are comparable to, or even lower than, those paid by poorer households. Together, these patterns imply that the incidence of VAT exemptions is regressive, in part because of

[19] In the Appendix, we show the raw trends in prices for the treatment and control groups in the phone survey data since the end of 2023 (see Figure A20 and Figure A21).

differences in consumption across the distribution.

Poorer households are also more likely to purchase food from informal stores and to reside in rural areas, which are further from competitive retail markets. These features further reduce the extent to which poorer households benefit from VAT exemptions, since our results show that prices declined primarily in formal stores in urban areas. Consequently, the incidence of VAT exemptions is regressive not only because of consumption patterns, but also because pass-through rates differ systematically across the income distribution.

We combine our data on consumption patterns with our estimates of realized pass-through to quantify how the benefits of the VAT exemptions were distributed across the income distribution. We then decompose overall incidence to assess the extent to which it is driven by differences in consumption patterns versus by differences in realized pass-through across store types (i.e., formal and informal) and locations (i.e., rural and urban). We show this formally as follows:

Let $q \in \mathcal{Q}$ index household expenditure (or income) quintiles, and let $i \in \mathcal{I}$ index goods (items). Let $s \in \mathcal{S}$ denote store type (or store), and $a \in \mathcal{A}$ denote geographic area. Define P_i^0 as the baseline (pre-reform) price of item i. Let $\text{Quantity}_{q,i}$ denote the average quantity of item i purchased by households in quintile q over the relevant horizon (e.g., per month). Let $\text{PassThrough}_{s,a,i}$ denote the estimated pass-through rate for item i at store type s in area a, i.e., the fraction of the statutory tax change that is reflected in consumer prices for that item–store–area cell.

$$\text{Benefit}(q) = \sum_{i \in \mathcal{I}} \sum_{s \in \mathcal{S}} \sum_{a \in \mathcal{A}} \omega_{q,s,a,i} \left(\text{Quantity}_{q,i} \times P_i^0 \times \frac{\tau}{1+\tau} \times \text{PassThrough}_{s,a,i} \right). \quad (2)$$

where $\tau = 0.10$ is the statutory VAT rate. Since P_i^0 is measured as the tax-inclusive pre-reform price, the maximum mechanical price reduction from fully removing VAT is $\tau/(1+\tau) = 0.091$. Thus, $\text{Quantity}_{q,i} \times P_i^0 \times \tau/(1+\tau)$ gives the value of the VAT embedded in

pre-reform purchases of item i by households in quintile q, and $\text{PassThrough}_{s,a,i}$ scales this amount by the share of the tax change passed through to consumer prices in store type s and area a.

In the weighted formulation, $\omega_{q,s,a,i}$ denotes the share of quintile-q purchases of item i made in store type s and area a, with $\omega_{q,s,a,i} \geq 0$ and

$$\sum_{s \in \mathcal{S}} \sum_{a \in \mathcal{A}} \omega_{q,s,a,i} = 1$$

for each (q, i). The total monetary benefit accruing to quintile q is therefore obtained by summing, across items and purchasing locations, the value of the VAT reduction embedded in baseline purchases multiplied by the realized pass-through rate faced by that quintile.

In practice, we compute the benefit for each household quintile-item purchase as baseline expenditure multiplied by the statutory tax wedge and the estimated pass-through rate for that item's store type and location. We then aggregate these benefits to estimate the share of total consumer benefits accruing to each quintile. The residual share of the statutory tax reduction not passed through to consumers is assigned to stores (including wholesalers, as we cannot distinguish between which parts of the supply chain are not fully passing through the VAT exemptions to consumers). We bootstrap the full procedure to obtain confidence intervals that incorporate uncertainty in both consumption patterns and pass-through estimates. Further details about the formal decomposition exercise are contained in Appendix B.

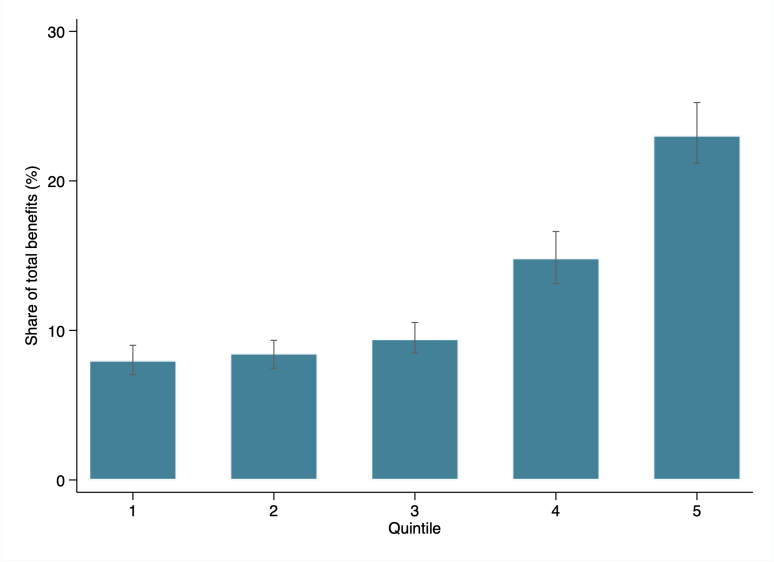
4.2.2 Main results

Figure 5 presents the incidence of the VAT exemption reform and decomposes the extent to which individual factors contribute to regressivity. Panel A shows the distribution of each dollar of foregone revenue across household expenditure quintiles. The household shares sum

to 64 percent because our estimated pass-through (see subsection 4.1.3) implies that 64 cents of each dollar of foregone revenue from formal stores nationwide reached consumers through lower prices. The remaining 36 cents was not passed through to households in the form of lower prices. Households in the poorest two quintiles received only around 16 percent of the foregone revenue, while households in the richest two quintiles captured around 40 percent of the benefits.

Panel B decomposes how consumption patterns, formality, and competition (proxied by the location of stores) contribute to regressivity. The dashed black line at 0 corresponds to a benchmark in which each quintile benefits equally from the reform. The blue line reports incidence when we incorporate differences in consumption patterns but ignore differences in pass-through. Under this scenario of equal pass-through across store types, items and locations, most of the benefits accrue to richer households. The green line then incorporates the estimated heterogeneity in pass-through due to informality (ignoring differences due to rural vs urban locations). Once this is taken into account, incidence becomes substantially more regressive. The red line then incorporates differences in incidence due to consumption patterns, heterogeneity in pass-through due to informality, and location. Once all these factors are taken into account, the poorest two quintiles only receive about 16 percent of the benefits. These results provide compelling evidence that heterogeneity in pass-through contributes around half as much to the regressivity of VAT exemptions as consumption patterns.

(a) Share of foregone revenue accruing to households, by quintile



(b) Decomposition of consumer-side incidence

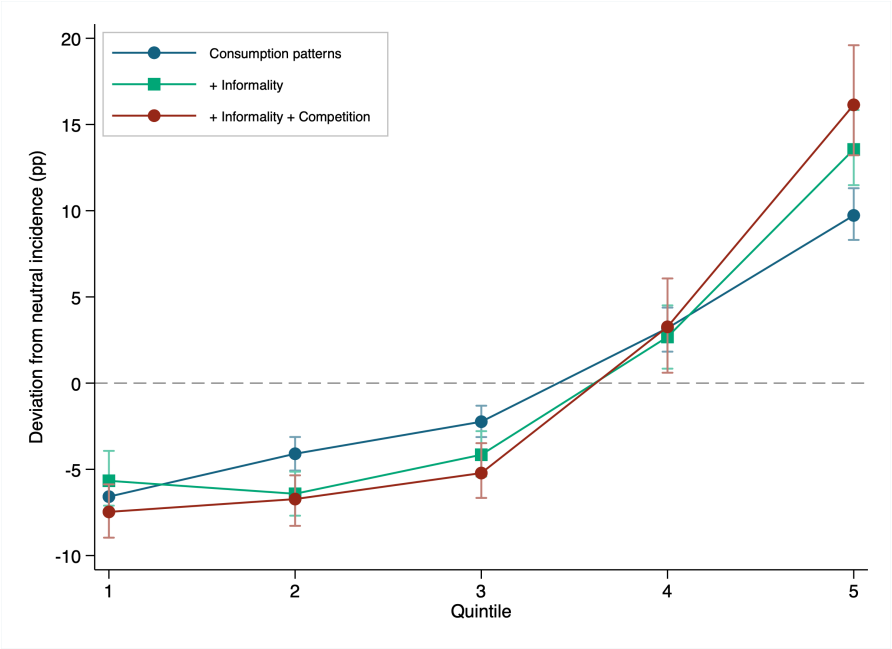


Figure 5: Incidence of VAT exemptions and decomposition of regressivity

Notes: Panel (a) reports the share of total foregone VAT revenue accruing to households in each expenditure quintile. The bars sum to 64 percent because the remaining share of foregone revenue is not passed through to households and is retained by stores and wholesalers. Panel (b) decomposes consumer-side incidence across quintiles. The blue series incorporates differences in consumption patterns only; the green series (labelled "+ Informality" in the legend) additionally incorporates heterogeneity in pass-through by store formality; and the red series (labelled "+ Informality + Competition") further incorporates heterogeneity in pass-through by location, which proxies for differences in competition. In Panel (b), values are shown as deviations from equal incidence across quintiles, so the zero line corresponds to an equal per-quintile share of consumer benefits. Positive values indicate that a quintile captures more than an equal share of consumer benefits.

These results raise the question of how plausible it is for VAT exemptions on a food item *to ever* be progressive in a lower-income setting. For this to occur, a food item would need to be a strongly inferior good, offsetting the countervailing effects of informality and competition that make the exemptions regressive. In terms of Figure 5, a VAT exemption would be progressive only if the blue line sloped downward steeply enough to more than offset the additional upward slope introduced by informality and competition in the red line. Given that in low-income settings, such as PNG, there is an absence of inferior goods, it is implausible for a VAT exemption on food to be progressive. Even in higher-income settings, such as the United States, truly inferior food items (at least broadly defined) are rare. The clearest evidence concerns beans/legumes being inferior food items, but even then, it is unlikely to be 'inferior enough' to overturn incidence patterns driven by where households shop and the pass-through they face. In the absence of informality, differential competition is likely to remain prevalent and could offset any progressivity due to consumption patterns.

4.2.3 Alternative policies to assist low-income households

We consider how "efficient" the VAT exemption reform in PNG was in terms of benefiting the poorest quintile of the income distribution, relative to alternative programs. Table 3 shows a series of alternative policies that could have delivered the same monetary benefit to the poorest quintile. A perfectly targeted transfer would achieve the same benefit for the cost of only 8 percent of the foregone revenue. A completely untargeted, universal cash transfer to households — requiring no information about income, etc — would achieve the same outcome for 40 percent of the cost. If half of the universal transfer were to "leak", this would still only have 80 percent of the cost of the current VAT exemption policy. Finally, we consider the cash component of an actual program piloted by the PNG government in 2025 that, if scaled nationwide, would cost the equivalent of the VAT exemption reform.[20] The program

[20]This program is not directly comparable to the hypothetical cash transfer programs in Table 3 as it includes the cash transfer provided to households and the nutrition services that they receive at no cost.

provides all families with a monthly cash payment for the first five years of a child's life (and a basic nutrition program to address stunting that is not included directly in this analysis, as PNG has among the highest stunting rates in the world). These examples illustrating the opportunity cost of the foregone revenue from VAT exemptions are consistent with more advanced work by Warwick et al. (2022), raising serious concerns about the efficiency of VAT exemptions as a poverty alleviation tool.

Table 3: Cost of delivering USD 12 million to the poorest quintile under alternative policies

Policy	Cost to deliver	Share of foregone revenue
Perfect targeting (Q1 only)	USD 12 million	8%
Universal transfer (no targeting)	USD 60 million	40%
Universal transfer (50% leakage)	USD 120 million	80%
Child grant and nutrition program	USD 150 million	100%
VAT exemption (actual)	USD 150 million	100%

Notes: This table compares the fiscal cost of alternative policies that would deliver the same monetary benefit to the poorest quintile as the VAT exemption reform. The benchmark assumes that the actual VAT exemption delivers approximately USD 12 million to the poorest quintile, or about 8 cents of each dollar of foregone revenue. The alternative rows report stylized transfer schemes under different targeting assumptions and implied leakage. The child grant and nutrition program row is included as a cost-equivalent benchmark — an actual program piloted by the PNG government that, if scaled nationwide, would cost approximately the same as the VAT exemption — rather than as a scheme calibrated to deliver USD 12 million to the poorest quintile.

Table 3 also provides insights into the welfare implications of the reform by showing the fiscal cost of alternative policies that would deliver the same dollar benefit to the poorest quintile as the VAT exemption. To make this comparison explicit in welfare terms, we compute a simple distributionally weighted value per dollar of fiscal cost. Let B_{pq} denote the dollar benefit accruing to quintile q under policy p, let B_{pf} denote the benefit retained by firms or store owners, let C_p denote the fiscal cost of policy p, and let g_q denote the social welfare weight placed on dollars accruing to quintile q. We define the distributionally weighted value per dollar of fiscal cost as

$$W_p = \frac{\sum_{q=1}^{5} g_q B_{pq} + g_f B_{pf}}{C_p}. \tag{3}$$

This is not a full dynamic Marginal Value of Public Funds (MVPF) calculation, since we do not estimate behavioral responses, fiscal externalities, or long-run effects. Instead, it provides a static MVPF-style comparison of the social value of each dollar of foregone revenue. Under the starkest Q1-dollar-equivalent benchmark, where only dollars accruing to the poorest quintile receive positive welfare weight, the VAT exemption has a value of only 0.08 per dollar of fiscal cost. By comparison, a perfectly targeted transfer has a value of 1.00, a universal transfer has a value of 0.20, and a universal transfer with 50 percent leakage has a value of 0.10. Thus, even an untargeted transfer would generate roughly two and a half times as much Q1-weighted value per fiscal dollar as the VAT exemption.

To understand the popularity of alternative policies relative to VAT exemptions, we added a question in the April 2026 round of the phone survey asking respondents what the best way the government could support poor and middle-class families would be. Respondents were provided with six options to select from based on policies the government was considering, including the VAT exemptions, the child grant program discussed above, free textbooks for schools, reducing government debt and removing fuel taxes. VAT exemptions were overwhelmingly the most popular, with over 70 percent of respondents selecting this option as their first or second preference (see Figure A22). This level of support was about double the second and third highest ranked options, free textbooks and reducing government debt, respectively. These results show that VAT exemptions are incredibly popular in this setting and that this may make it challenging for policymakers to remove them.

This stated popularity, however, may not survive households learning who actually benefits from the exemptions. To examine this, we embedded a survey experiment in the May 2026 round of the phone survey ($N = 995$). Respondents were randomly assigned to a control group, which was asked their view directly, or to a treatment group, which was first told that recent estimates suggest poorer households benefit less from the policy than richer households, because the price reductions are concentrated in the large urban supermarkets

where richer households shop.[21] Both groups were then asked how strongly they supported or opposed removing the tax on food items, on a five-point scale (rescaled so that higher values denote greater support). Because the module was fielded only in this round, the estimates capture households' response to this information on first exposure.

On average, the treatment reduced support modestly (-0.12 on the five-point scale; s.e. 0.06), but this small effect is concentrated entirely among households whose priorities lay elsewhere (Table A4). Among the slight majority who had not named removing food taxes as their preferred way to support households in April 2026, learning that the exemptions are regressive significantly reduced support (-0.23, s.e. 0.09); among those who had already named it, the treatment had no effect ($+0.05$, n.s.), and the gap between the two groups is statistically significant (interaction $p = 0.046$). The erosion is concentrated among respondents whose first choice was a cash transfer for families with young children—a more tightly targeted instrument—for whom the treatment lowered support by close to a full point on the scale (-0.80, $p < 0.01$). Support for the exemptions is thus broad but shallow: telling households that the benefits accrue disproportionately to richer families is enough to erode the backing of those who would prefer the same resources spent on more targeted transfers, while leaving its existing supporters unmoved.

4.3 Comparison with Expert Predictions

4.3.1 Data collection

We conducted an expert prediction survey to assess whether the observed pass-through and incidence patterns were anticipated by researchers and policy specialists. The survey was hosted on the Social Science Prediction Platform (SSPP) from July to September 2025. Ex-

[21] The treatment read: "In 2025, the PNG government introduced a policy to remove tax from some basic food items. Recent estimates suggest that poorer households benefit less from this policy than richer households. This is because prices mainly reduce in large supermarkets in urban areas where richer households shop."

perts were invited to complete the survey from an existing pool of researchers maintained by SSPP, through social media advertisements, and emails from the authors. A total of 237 experts accepted the invitation and participated in the survey. Among those who participated, 59 percent declared economics as their main field, 65 percent worked in academia, 50 percent stated they were a public finance expert, and 62 percent had relevant country experience.[22] Further details about the experts are in Table A5 in the Appendix.

4.3.2 Results

Experts substantially misjudged the extent of pass-through across store types, locations, and data sources, and overestimated how much poorer households would benefit from this reform (see detailed results in Figure A23 to Figure A33 in the Appendix). On average, experts predicted similar pass-through rates to prices across the four main data sources used in this study. They accurately predicted that there would be minimal differences between formal chains and independent supermarkets and that informal stores would have lower pass-through rates. However, they surprisingly expected the foregone revenue from the VAT exemptions to benefit poorer quintiles slightly more than richer quintiles.

Overall, heterogeneity between experts is modest (see Figure A34 and Figure A35 in the Appendix). Self-reported confidence in predictions has essentially zero correlation with accuracy. Expertise in tax incidence is associated with a higher predicted share for the richest quintile and those with a development economics background were more likely to predict a lower share for the poorest quintile. The magnitude of the gaps between expert subgroups is small relative to the gap between expert predictions and actual outcomes. No subgroup of experts came close to predicting the extreme regressivity of VAT exemptions observed in the data.

We aggregated the expert predictions of pass-through and incidence and directly com-

[22] Of the 237 experts who began the survey, 181 provided responses that were recorded on the platform, and 131 completed it in full.

pared these with what we actually observed in the data. Figure 6 presents a summary of what, on average, expert predictions (green bars) suggest about how the foregone revenue would be distributed between each quintile of the household income distribution and shops (stores, wholesalers, etc.). They expected half of the foregone revenue to be captured by stores, with the remainder split relatively evenly across quintiles. This contrasts starkly with the actual results presented in Figure 6 (blue bars). Stores and consumers in the richest two quintiles were the main beneficiaries of the reform, accruing almost 80 percent of the foregone revenue. This left around 25 percent of the benefits for the poorest 60 percent of the population. The poorest quintile only captured about eight cents of every dollar in foregone revenue.

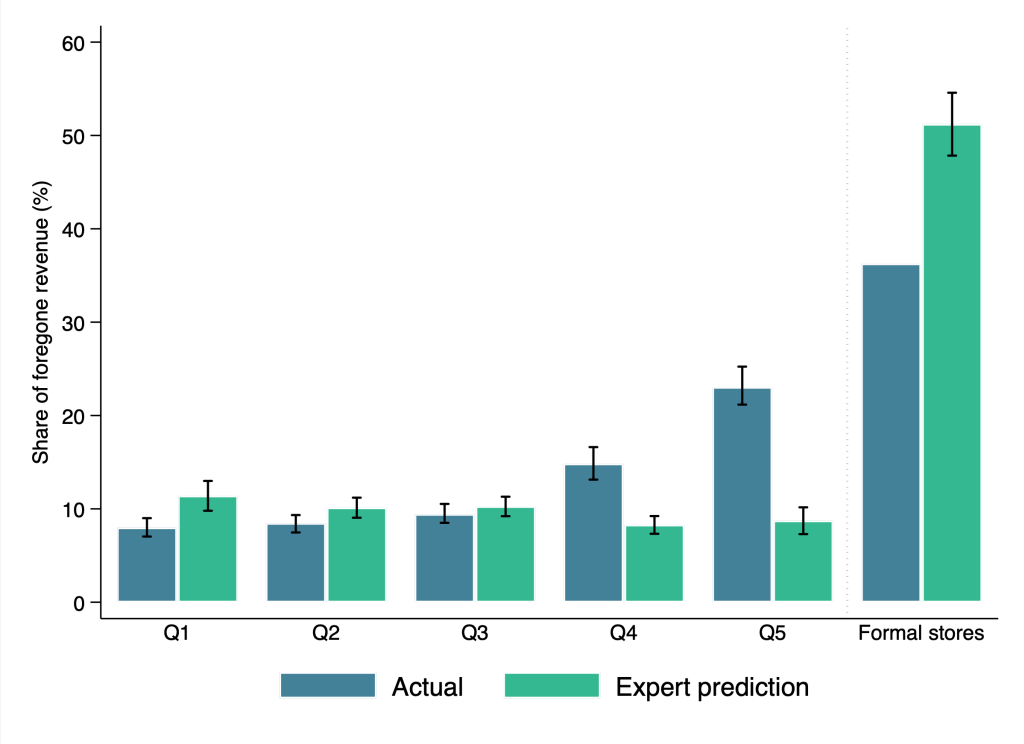


Figure 6: Actual incidence vs. expert predictions of revenue lost across quintiles and stores

Notes: This figure compares the realized incidence of the VAT exemption reform with experts' ex ante predictions. Bars show the share of foregone revenue accruing to formal stores and to each household expenditure quintile. Realized incidence is computed from the phone survey using observed consumption patterns and estimated pass-through, while predicted incidence is based on the expert survey. The figure highlights the gap between expected and actual distributional outcomes.

4.4 Additional analysis

4.4.1 Differences between chain and independent stores

The pass-through to prices was similar in chain and independent stores. In the Appendix, we show the difference-in-differences results based on the supermarket census data disaggregated by whether stores were part of a chain or independent (see Figure A36 and Figure A37). There is an almost identical average pass-through rate in these store types and a similar distribution of pass-through rates within each store type. This result is counter to a recent study that shows that the pass-through rates of VAT cuts tend to be lower in independent stores compared to chain supermarkets (Benzarti et al., 2024). The authors argue that this is because chain supermarkets and independent stores are subject to different levels of political pressure, government monitoring, and competition. In our context, the level of political pressure applied to supermarkets was very superficial, and there was no mechanism to force stores to lower prices. This could explain why we do not observe a similar pattern.

4.4.2 Differences between products

Pass-through to prices was substantially higher for basic food items (e.g., rice) than for "quasi-luxury" items (e.g., tinned meat). In the Appendix, we present difference-in-differences estimates from the supermarket census data disaggregated by whether items are more basic or more "luxurious", where this classification is based on the share of households from each income quintile that purchase each item in the phone survey (see Figure A38). We find markedly lower initial pass-through for quasi-luxury items, which are disproportionately sold in higher-end supermarkets. In contrast, basic items—which tend to be available across nearly all stores—exhibit effectively full pass-through immediately following the reform. This pattern is consistent with competition being a key driver of heterogeneity in pass-through. Quasi-luxury items are carried by fewer stores, so retailers selling them face

weaker competitive pressure and therefore pass through a smaller share of the VAT exemption. Conversely, basic items are available in most stores, implying stronger competition and substantially higher pass-through of the VAT exemption to prices.

5 Discussion

We demonstrate that the introduction of VAT exemptions in a lower-income country setting with high informality did not significantly benefit poorer households; rather, richer households were the primary beneficiaries. This result is despite very high pass-through rates at formal supermarkets in the central area of the largest city, likely due to intense competition among stores. Elsewhere in the country, store owners (or potentially further up the supply chain) were more likely to exercise some degree of spatial monopolistic power and avoid passing through a substantial share of VAT exemptions to consumers. On average, we estimate that 36 percent of the foregone revenue went to formal stores (including wholesalers) nationwide, as the pass-through rate was 64 percent in these stores three months after the reform and persisted for a year. The key reasons why richer households benefited the most from the reform are that they consume more of the exempt items, are less likely to rely on subsistence agriculture, and are more likely to purchase from formal stores in urban areas—which face more competition and thus pass through a larger share of the VAT exemption to prices. This resulted in the richest two quintiles collecting around 40 percent of the foregone revenue, while the poorest two quintiles collected only around 16 percent.

The stark contrast between the results of the expert prediction survey and our findings illustrates how we add substantially to the existing knowledge base. First, our results, showing very high pass-through of VAT exemptions when competition is strong, were not predicted by experts who, on average, underestimated pass-through in formal stores in urban areas and overestimated it elsewhere. Expert predictions are somewhat consistent with what

can be inferred from the existing literature, which indicates that only partial pass-through of VAT exemptions is observed in formal stores in Argentina (Benzarti et al., 2024) and that changes in consumption taxes impact prices in informal stores in India (Brusco and Velayudhan, 2025). We rationalize that the discrepancy between our results and expert predictions (as well as prior studies in other settings) is likely due to nuances in the nature of competition in lower-income settings, such as Papua New Guinea. In particular, there is substantial market segmentation between formal and informal stores, yet within a given market with a high density of stores, competition remains strong.

Second, the extremely high regressivity of VAT exemptions observed in our study was not predicted by experts. On average, experts thought each quintile would benefit relatively evenly, in absolute terms.[23] These predictions are not consistent with the findings of a recent seminal study using microsimulations that shows informality can make VAT exemptions regressive (Bachas et al., 2023). Our study extends this existing work by showing, with actual price data, how much informality adds to regressivity beyond consumption patterns, and we introduce the role of competition in further driving regressive outcomes. Beyond the role of informality, we account for the differences between our results and expert predictions as potentially due to a lack of appreciation of the positive income elasticity of consumer demand for basic food items in lower-income settings. We show that, before and after the reform, even for the most basic items, richer households purchase relatively more at lower or equivalent prices than poorer households.

Overall, this study provides unparalleled evidence in a lower-income setting, illustrating that VAT exemptions are an inefficient way for governments to support poorer households. We build on prior work by being the first to illustrate the regressivity of differential pass-through to prices. Our results also shed novel light on how misperceptions about competition,

[23]No subgroup of experts, even those with relevant experience in lower-income settings, was close to predicting the degree of regressivity we observe.

informality, and the income elasticity of consumer demand for basic foods may explain why policymakers still use VAT exemptions. The contrast between the expert predictions and our findings illustrates that VAT exemptions are even more regressive than initially appreciated and raises questions about the suitability of VAT cuts as an equity-enhancing policy instrument in low-income countries, underscoring the need for alternative fiscal policies, such as cash transfers. While concerns remain about the ability to reach poorer households with cash transfers in lower-income settings — characterized by high informality and limited administrative data — we demonstrate that even a poorly targeted social protection program is likely to be much more progressive than VAT exemptions. However, we also show that VAT exemptions are far more popular than alternative policies, such as cash transfers, potentially due to misperceptions about who primarily benefits from them.

There are several limitations to this study that are worth noting. First, we are unable to track the full supply chain to observe how intermediaries — wholesalers, importers, and distributors — responded to the VAT exemption reform. Comprehensive data on firm-to-firm transactions does not exist in PNG, even within the revenue authority, which is a common challenge in countries at this level of development. As a result, we cannot directly decompose how the share of foregone revenue that is not passed on is split between retailers and upstream actors in the supply chain. This creates the possibility that incomplete pass-through in rural informal markets reflects upstream capture by wholesalers, transporters, or informal distributors, rather than local retail market competition, although this would not change our central finding that very little of the foregone revenue reached poorer households. Second, our nationwide estimates of pass-through and incidence rely on self-reported data from the phone survey panel. However, we provide several pieces of evidence suggesting that reporting behavior is unlikely to have changed in response to the reform — most notably that around 97 percent of respondents were not very familiar with the VAT exemptions six months after implementation. We acknowledge that self-reported data are inherently

noisier than directly observed prices, and the resulting estimates outside Port Moresby are correspondingly less precise. Third, although PNG shares many characteristics with other lower-income countries — high informality, a predominantly rural and subsistence-based population, and VAT collection concentrated in a single urban center — caution is warranted in extrapolating the specific magnitudes we document to other settings. The qualitative mechanisms we identify (informality, market segmentation, and the positive income elasticity of demand for basic food) are likely to generalize, but the relative weight of each margin will depend on local retail market structure, the spatial distribution of competition, and institutional capacity to monitor compliance.

Future research could proceed in several directions. First, studies could leverage price data linked to household purchases to shed further light on the pass-through and incidence of VAT exemptions, particularly the conditions under which differential pass-through generates regressive outcomes and the settings in which it is most pronounced. Second, researchers could examine more systematically the role of competition in shaping the efficiency and distributional consequences of tax policy in lower-income countries, as our findings suggest that experts often misjudge its relevance. Third, it remains an open question how the pass-through and incidence of VAT exemptions operate for inferior goods, and at what levels of development this may actually become policy relevant. Finally, our study highlights substantial scope for using novel sources of price data to conduct rigorous analyses of public finance and empirical industrial organization questions even in highly data-constrained environments.

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Appendix A - Additional Figures and Tables

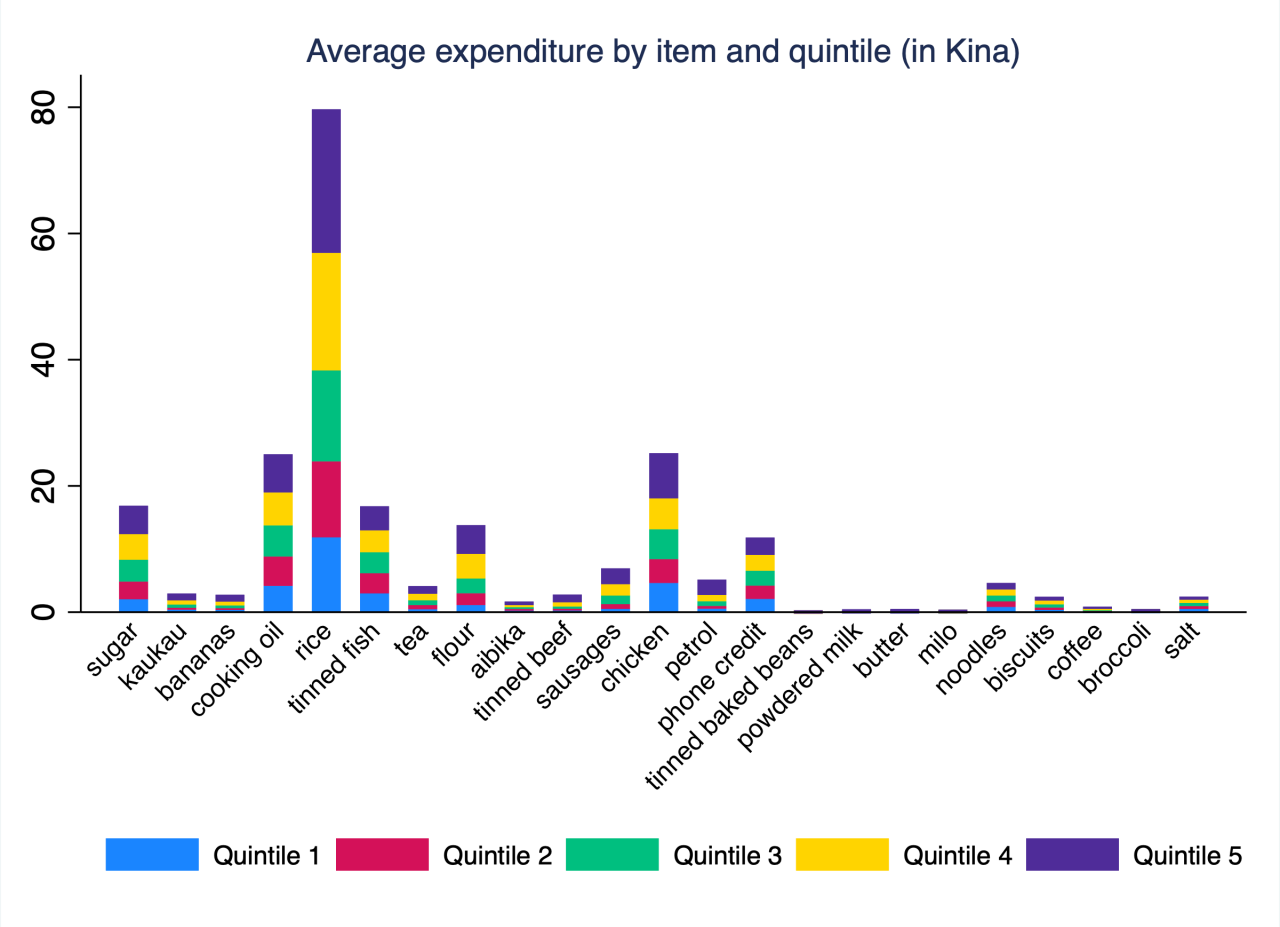


Figure A1: Average expenditure by item per quintile

Notes: This figure shows average monthly household expenditure on each item, in PNG Kina, by household expenditure quintile. Data are from the nationally representative monthly phone survey panel.

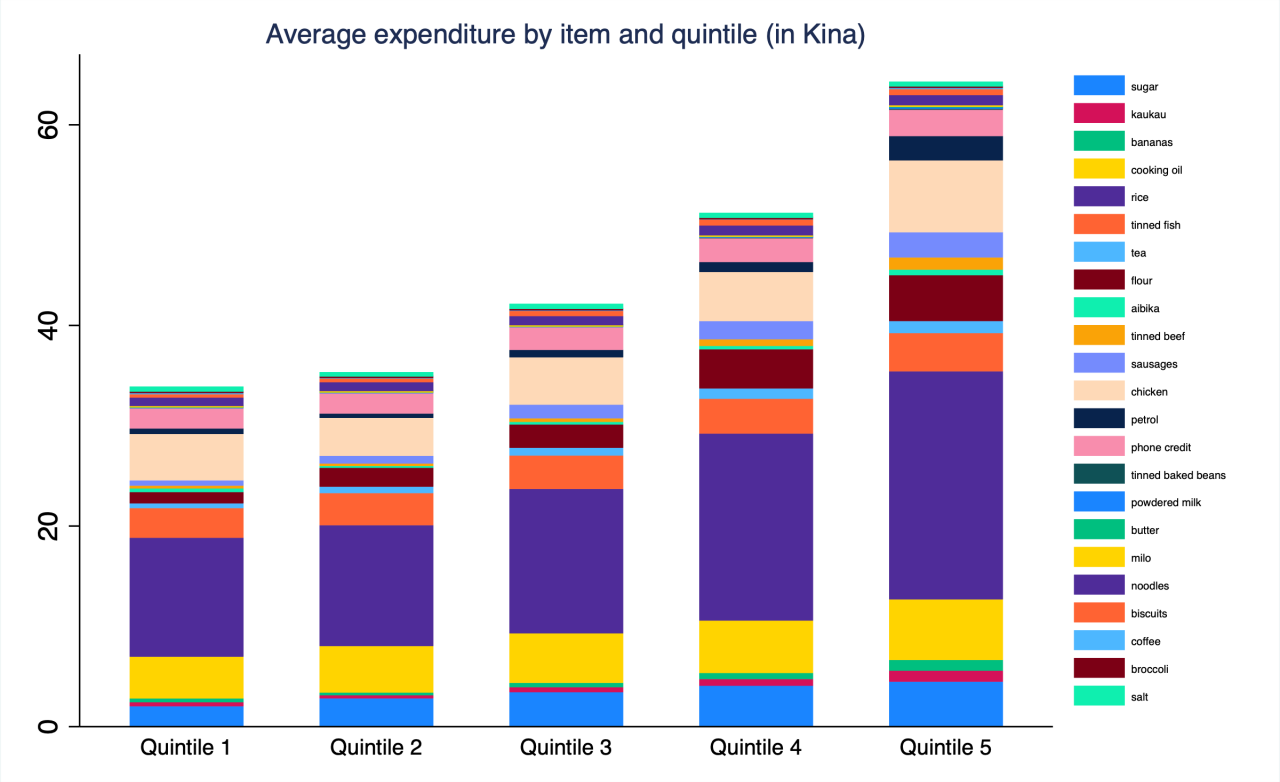


Figure A2: Average expenditure by quintile per item

Notes: This figure shows average monthly household expenditure, in PNG Kina, by expenditure quintile for each item. Data are from the nationally representative monthly phone survey panel.



Figure A3: Average expenditure by quintile on basic items

Notes: This figure shows average monthly household expenditure on basic items, in PNG Kina, by expenditure quintile. Data are from the monthly phone survey panel. The classification of items as basic versus quasi-luxury is based on the share of households in each quintile purchasing each item (see Section 4.4).

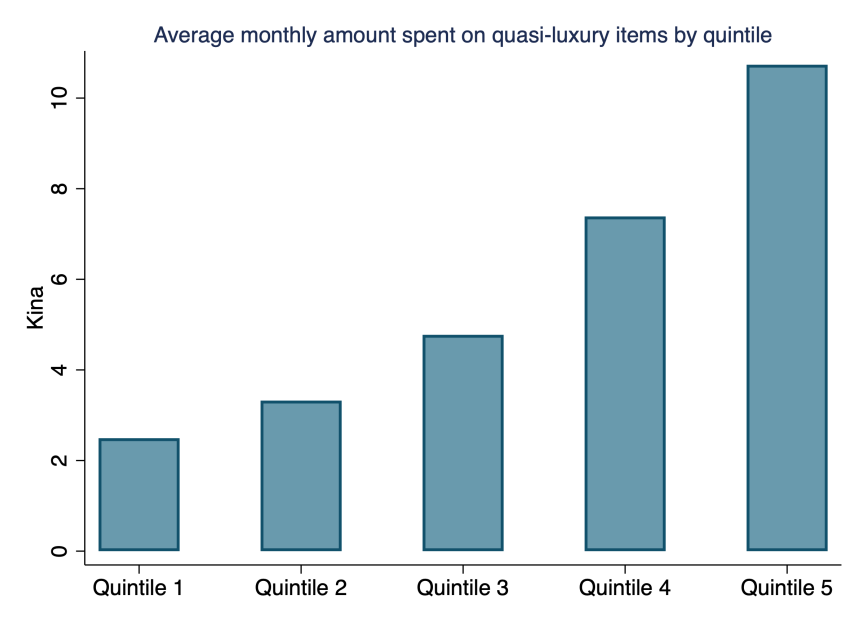


Figure A4: Average expenditure by quintile on quasi-luxury items

Notes: This figure shows average monthly household expenditure on quasi-luxury items, in PNG Kina, by expenditure quintile. Data are from the monthly phone survey panel. The classification of items as basic versus quasi-luxury is based on the share of households in each quintile purchasing each item (see Section 4.4).

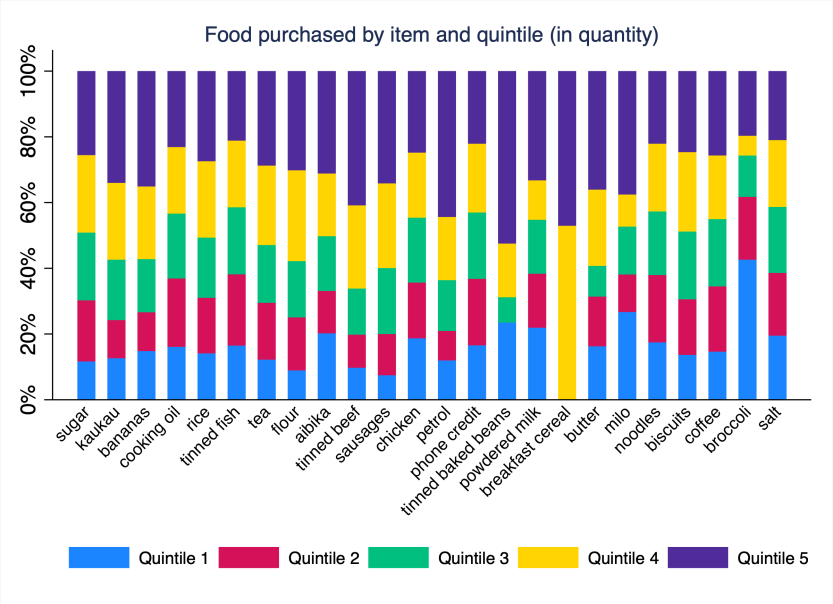


Figure A5: Quantity purchased by item per quintile

Notes: This figure shows the average monthly quantity purchased of each item, in standard measurement units, by expenditure quintile. Data are from the monthly phone survey panel.

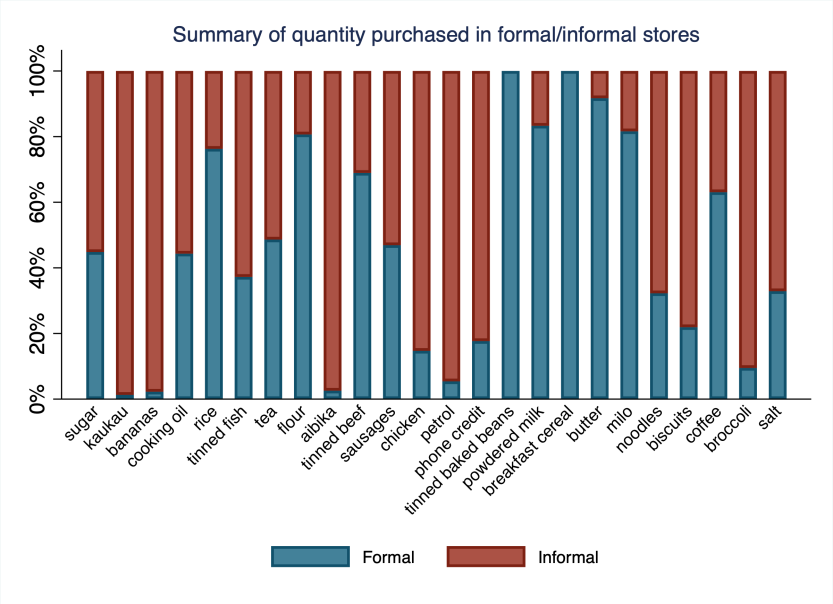


Figure A6: Quantity purchased by item by store type

Notes: This figure shows the average monthly quantity purchased of each item at formal versus informal stores, as reported by respondents in the monthly phone survey panel.

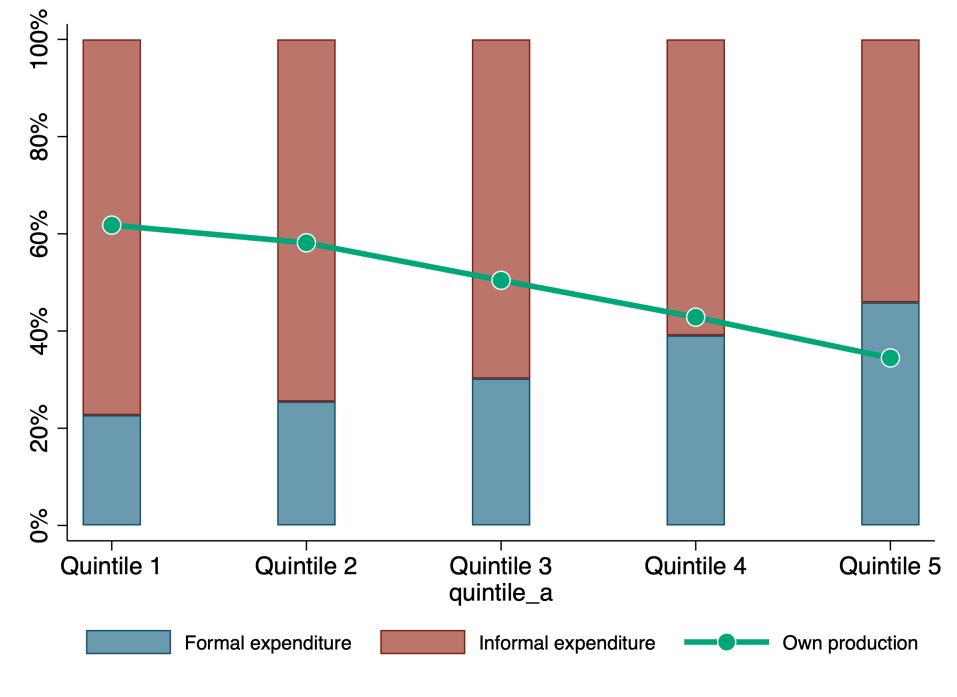
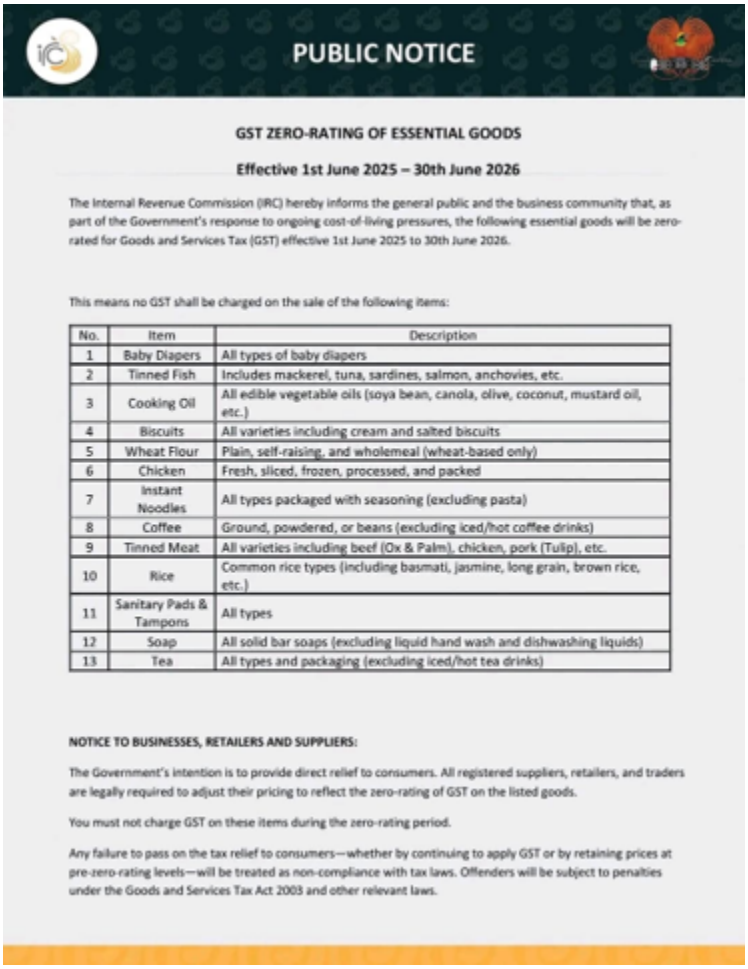


Figure A7: Type of consumption and expenditure by quintile

Notes: This figure shows how the composition of household consumption and expenditure varies across expenditure quintiles, based on 2024 data from the monthly phone survey panel.



PUBLIC NOTICE

GST ZERO-RATING OF ESSENTIAL GOODS

Effective 1st June 2025 – 30th June 2026

The Internal Revenue Commission (IRC) hereby informs the general public and the business community that, as part of the Government's response to ongoing cost-of-living pressures, the following essential goods will be zero-rated for Goods and Services Tax (GST) effective 1st June 2025 to 30th June 2026.

This means no GST shall be charged on the sale of the following items:

No.	Item	Description
1	Baby Diapers	All types of baby diapers
2	Tinned Fish	Includes mackerel, tuna, sardines, salmon, anchovies, etc.
3	Cooking Oil	All edible vegetable oils (soya bean, canola, olive, coconut, mustard oil, etc.)
4	Biscuits	All varieties including cream and salted biscuits
5	Wheat Flour	Plain, self-raising, and wholemeal (wheat-based only)
6	Chicken	Fresh, sliced, frozen, processed, and packed
7	Instant Noodles	All types packaged with seasoning (excluding pasta)
8	Coffee	Ground, powdered, or beans (excluding iced/hot coffee drinks)
9	Tinned Meat	All varieties including beef (Ox & Palm), chicken, pork (Tulip), etc.
10	Rice	Common rice types (including basmati, jasmine, long grain, brown rice, etc.)
11	Sanitary Pads & Tampons	All types
12	Soap	All solid bar soaps (excluding liquid hand wash and dishwashing liquids)
13	Tea	All types and packaging (excluding iced/hot tea drinks)

NOTICE TO BUSINESSES, RETAILERS AND SUPPLIERS:

The Government's intention is to provide direct relief to consumers. All registered suppliers, retailers, and traders are legally required to adjust their pricing to reflect the zero-rating of GST on the listed goods.

You must not charge GST on these items during the zero-rating period.

Any failure to pass on the tax relief to consumers—whether by continuing to apply GST or by retaining prices at pre-zero-rating levels—will be treated as non-compliance with tax laws. Offenders will be subject to penalties under the Goods and Services Tax Act 2003 and other relevant laws.

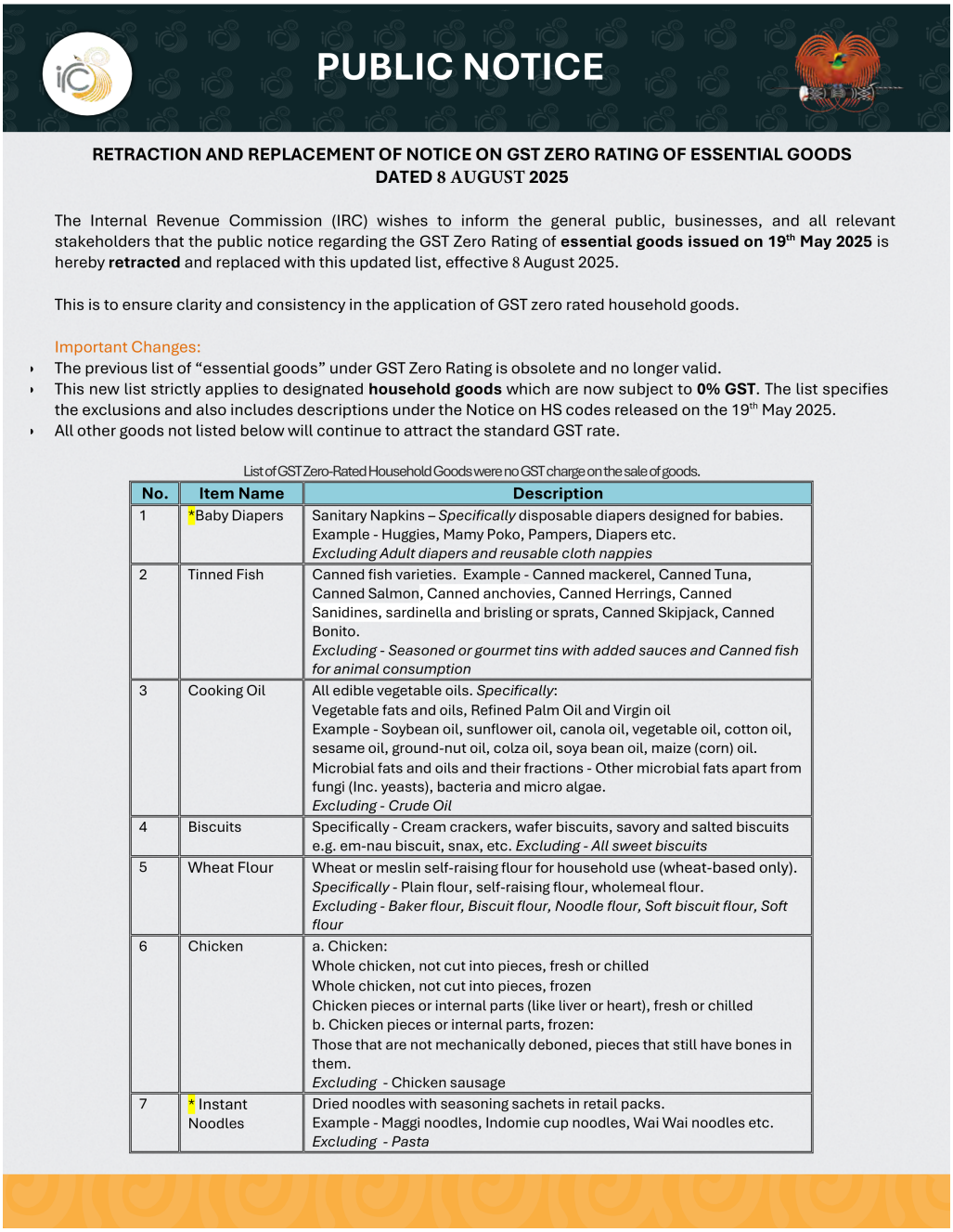
Figure A8: First official notice from the PNG Government about the VAT exemption reform

Notes: This figure reproduces the first official notice issued by the PNG Government (dated 19 May 2025) announcing the introduction of GST zero rating for selected essential goods, effective 1 June 2025.

Table A1: Timeline of the VAT Exemptions Reform and Study Data Collection

Date	Event
Oct 2023 to May 2026	Nationally representative, monthly **phone survey panel** (about 1,000 households/month) measuring quantities, expenditures, and store type (formal/informal) for 20 items.
Dec 2023 to May 2026	**Administrative data** collected monthly by (i) Central Bank of PNG research team and (ii) National Statistics Office CPI team; providing detailed price data for over 100 items from a subset of formal supermarkets in Port Moresby.
29 Nov 2024	PNG government first publicly stated the *possibility* of removing VAT from some basic items in mid-2025; details were limited and credibility unclear.
19 May 2025	Policymakers announced that VAT exemptions for 10 food items (and 3 non-food items) would take effect on **June 1, 2025** (i.e., 12 days later).
May-Aug 2025	Weekly web-scraped all **online prices** from the two chains offering online shopping in Port Moresby (including the use of "time machine" software to check prices before reform announced).
May-Nov 2025	Monthly in-store **supermarket census** collected prices for 20 food items (10 exempt and 10 non-exempt) in all 83 formal supermarkets in Port Moresby.
1 June 2025	Reform implemented: VAT on 10 food items set to zero-rated (functionally close to an exemption in practice). Exemptions initially scheduled to remain in place for 13 months (later extended; see the 25 Nov 2025 entry).
July-Sep 2025	Expert prediction survey hosted on SSPP to benchmark beliefs about pass-through and incidence against realized outcomes.
8 Aug 2025	Policymakers issued revised guidance clarifying the details of the reform and outlining plans to monitor its impact on prices.
25 Nov 2025	PNG government announced an extension of the VAT exemption policy to the end of 2026 (i.e., 19 months in total).
Dec 2025	Phone survey question about how familiar households are with the details of the reform six months after implementation.

Notes: The table lists both policy milestones and the data-collection windows used to estimate pass-through and incidence.



PUBLIC NOTICE

RETRACTION AND REPLACEMENT OF NOTICE ON GST ZERO RATING OF ESSENTIAL GOODS DATED 8 AUGUST 2025

The Internal Revenue Commission (IRC) wishes to inform the general public, businesses, and all relevant stakeholders that the public notice regarding the GST Zero Rating of **essential goods issued on 19th May 2025** is hereby **retracted** and replaced with this updated list, effective 8 August 2025.

This is to ensure clarity and consistency in the application of GST zero rated household goods.

Important Changes:

- The previous list of "essential goods" under GST Zero Rating is obsolete and no longer valid.
- This new list strictly applies to designated **household goods** which are now subject to **0% GST**. The list specifies the exclusions and also includes descriptions under the Notice on HS codes released on the 19th May 2025.
- All other goods not listed below will continue to attract the standard GST rate.

List of GST Zero-Rated Household Goods were no GST charge on the sale of goods.

No.	Item Name	Description
1	*Baby Diapers	Sanitary Napkins – *Specifically* disposable diapers designed for babies. Example - Huggies, Mamy Poko, Pampers, Diapers etc. *Excluding Adult diapers and reusable cloth nappies*
2	Tinned Fish	Canned fish varieties. Example - Canned mackerel, Canned Tuna, Canned Salmon, Canned anchovies, Canned Herrings, Canned Sanidines, sardinella and brisling or sprats, Canned Skipjack, Canned Bonito. *Excluding - Seasoned or gourmet tins with added sauces and Canned fish for animal consumption*
3	Cooking Oil	All edible vegetable oils. *Specifically*: Vegetable fats and oils, Refined Palm Oil and Virgin oil Example - Soybean oil, sunflower oil, canola oil, vegetable oil, cotton oil, sesame oil, ground-nut oil, colza oil, soya bean oil, maize (corn) oil. Microbial fats and oils and their fractions - Other microbial fats apart from fungi (Inc. yeasts), bacteria and micro algae. *Excluding - Crude Oil*
4	Biscuits	Specifically - Cream crackers, wafer biscuits, savory and salted biscuits e.g. em-nau biscuit, snax, etc. *Excluding - All sweet biscuits*
5	Wheat Flour	Wheat or meslin self-raising flour for household use (wheat-based only). *Specifically* - Plain flour, self-raising flour, wholemeal flour. *Excluding - Baker flour, Biscuit flour, Noodle flour, Soft biscuit flour, Soft flour*
6	Chicken	a. Chicken: Whole chicken, not cut into pieces, fresh or chilled Whole chicken, not cut into pieces, frozen Chicken pieces or internal parts (like liver or heart), fresh or chilled b. Chicken pieces or internal parts, frozen: Those that are not mechanically deboned, pieces that still have bones in them. *Excluding* - Chicken sausage
7	* Instant Noodles	Dried noodles with seasoning sachets in retail packs. Example - Maggi noodles, Indomie cup noodles, Wai Wai noodles etc. *Excluding - Pasta*

Figure A9: Second official notice from the PNG Government about the VAT exemption reform (page 1 of 3)

8	Coffee	Instant and brewed coffee, caffeinated or decaffeinated, in standard household sizes *Specifically* - Nescafe Classic, NESCAFÉ Gold, Robert Timms, instant coffee powders, brewed ground coffee, 3-in-1 sachets (plain only) *Excluding - Roast coffee or coffee beans, caffeinated or decaffeinated that is flavored or milk-added variations)*
9	Tinned Meat	Canned chicken, Canned pork, Canned corned beef for household consumption. *Specifically* - Ox & Palm Corned Beef, Spam, canned chicken chunks, canned pork, picnic ham. *Excluding - Mixed meals or spiced/curried varieties, tinned meat for animal feed not for human consumption.*
10	Rice	Common varieties consumed in households Specifically - Jasmine rice, long grain rice, medium grain, soft rice, ori rice, sweet rice commercial. *Excluding - Animal feed rice or broken rice for stock feed.*
11	*Sanitary Pads & Tampons	Feminine hygiene products. Example - Always, Libra, Softy, Whisper, tampons etc. (packaged for household retail use)
12	Soap	All solid bar soaps. Example - e.g. WasWas, Klina, etc. *Excluding - Liquid hand wash, powdered soaps, dishwashing liquids*
13	Tea	All types and packaging. *Excluding - Herbal or medicinal teas, iced /hot tea drinks*

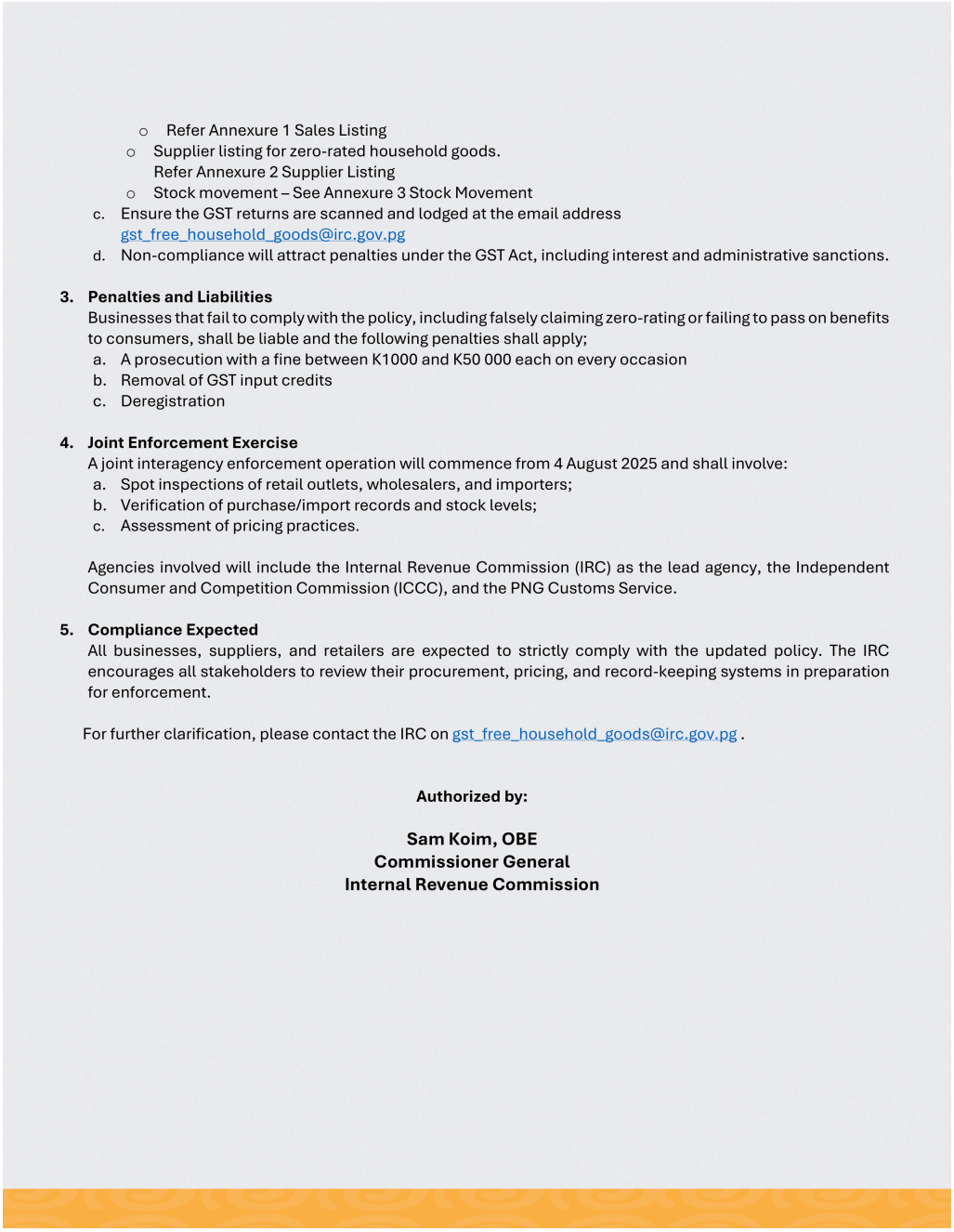
** These goods will require the taxpayer to request in writing to the Internal Revenue Commission for GST zero-rated on the household goods imported.*
Addressed to: Internal Revenue Commission (IRC), P.O. Box 777, Port Moresby, NCD.
Attention: GST zero-rated Household Goods

1. **Important Conditions**
   a. Stock Eligibility Date
      - Only household goods acquired or imported on or after 1 January 2025 and held in stock as of 1 June 2025 will qualify for GST zero-rating.
      - Any stock acquired before 1 January 2025 will not be eligible for GST zero-rating.
   b. Input Tax Credit Condition
      - Input tax credits will only be allowed if the business can demonstrate, with documentation, that the benefit of the zero-rating has been passed on to the final consumer through reduced prices.
   c. Proof of Compliance
      - Businesses must retain valid purchase/import documents, stock records, and sales invoices showing compliant pricing structures.

   Notwithstanding the above, businesses are hereby advised that input tax credits will only be allowed if proven that the benefits of zero-rating were passed on to the consumers.

2. **Important Information for Retailers and Suppliers:**
   a. All businesses are required to
      I. Update their pricing, invoicing, and accounting systems to reflect the revised zero-rated household goods list.
      II. Clearly indicate on the shelf the essential goods being GST Zero rated with the pricing.
   b. Lodge GST returns accurately reporting zero-rated sales from the effective date with the following attachments:
      - Cover letter - Label the letter clearly: "GST Zero-Rated Household Goods".
      - Sales listing for zero-rated household goods.

Figure A9: Second official notice from the PNG Government about the VAT exemption reform (page 2 of 3)



- Refer Annexure 1 Sales Listing
- Supplier listing for zero-rated household goods.
  Refer Annexure 2 Supplier Listing
- Stock movement – See Annexure 3 Stock Movement

c. Ensure the GST returns are scanned and lodged at the email address gst_free_household_goods@irc.gov.pg
d. Non-compliance will attract penalties under the GST Act, including interest and administrative sanctions.

3. Penalties and Liabilities

Businesses that fail to comply with the policy, including falsely claiming zero-rating or failing to pass on benefits to consumers, shall be liable and the following penalties shall apply;

a. A prosecution with a fine between K1000 and K50 000 each on every occasion
b. Removal of GST input credits
c. Deregistration

4. Joint Enforcement Exercise

A joint interagency enforcement operation will commence from 4 August 2025 and shall involve:

a. Spot inspections of retail outlets, wholesalers, and importers;
b. Verification of purchase/import records and stock levels;
c. Assessment of pricing practices.

Agencies involved will include the Internal Revenue Commission (IRC) as the lead agency, the Independent Consumer and Competition Commission (ICCC), and the PNG Customs Service.

5. Compliance Expected

All businesses, suppliers, and retailers are expected to strictly comply with the updated policy. The IRC encourages all stakeholders to review their procurement, pricing, and record-keeping systems in preparation for enforcement.

For further clarification, please contact the IRC on gst_free_household_goods@irc.gov.pg .

Authorized by:

Sam Koim, OBE
Commissioner General
Internal Revenue Commission

Figure A9: Second official notice from the PNG Government about the VAT exemption reform (page 3 of 3)

Notes: This figure reproduces the second official notice, issued by the Internal Revenue Commission on 8 August 2025, which retracted and replaced the 19 May 2025 notice, clarified the list of zero-rated household goods, and outlined monitoring and enforcement arrangements.

Table A2: Provincial distribution of the phone survey sample and census population

	Phone survey			Census
Province	All months	One month	Monthly average	Population share
Bougainville	4.72	5.76	4.35	3.51
Central	2.88	2.49	2.74	3.01
Chimbu	5.45	7.20	5.88	5.54
East New Britain	4.88	5.10	4.73	4.25
East Sepik	5.80	6.02	6.05	6.36
Eastern Highlands	8.83	7.72	8.28	9.97
Enga	4.69	5.63	5.41	5.56
Gulf	1.92	1.96	2.09	1.88
Hela	3.19	5.10	4.25	4.75
Jiwaka	4.65	4.97	5.40	4.74
Madang	6.07	5.24	5.84	6.27
Manus	2.42	2.62	2.39	0.75
Milne Bay	2.34	1.83	2.02	4.02
Morobe	8.41	6.54	8.02	9.46
National Capital District	5.99	5.89	4.73	3.46
New Ireland	3.38	2.62	3.21	2.16
Northern (Oro)	2.04	2.09	2.21	2.48
Southern Highlands	5.03	6.54	6.56	6.40
West New Britain	4.57	2.88	3.49	3.69
West Sepik (Sandaun)	4.45	3.66	3.91	3.27
Western	1.88	1.05	1.65	2.28
Western Highlands	6.41	6.81	6.82	6.19

Notes: Entries report percentage shares by province. The "All months" column reports the distribution of all respondent-month observations pooled across survey rounds. The "One month" column reports the distribution of respondents in a single survey round. The "Monthly average" column reports the average provincial share across monthly survey rounds. The census column reports each province's share of Papua New Guinea's population. Columns may not sum exactly to 100 because of rounding.

Table A3: Familiarity with National Government's Efforts to Reduce Tax

Response	Freq.	Percent	Cum.
Not at all	509	37.99	37.99
A little	537	40.07	78.06
Somewhat	249	18.58	96.64
Very Familiar	45	3.36	100.00
Total	1,340	100.00	

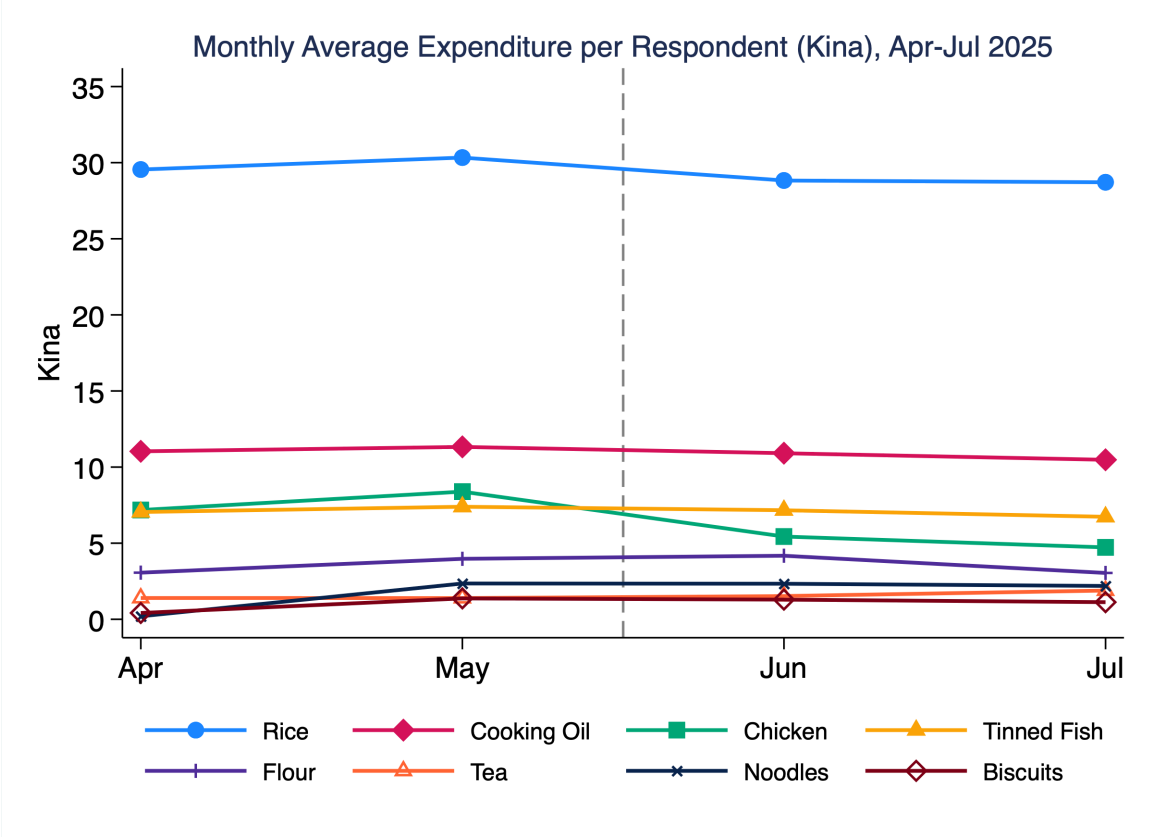


Figure A10: Average monthly expenditure on exempt items

Notes: This figure shows average monthly household expenditure on the VAT-exempt items in the phone survey panel. Expenditure remains stable around the June 2025 reform date, consistent with the absence of meaningful substitution between exempt and non-exempt items (see Section 3.2).

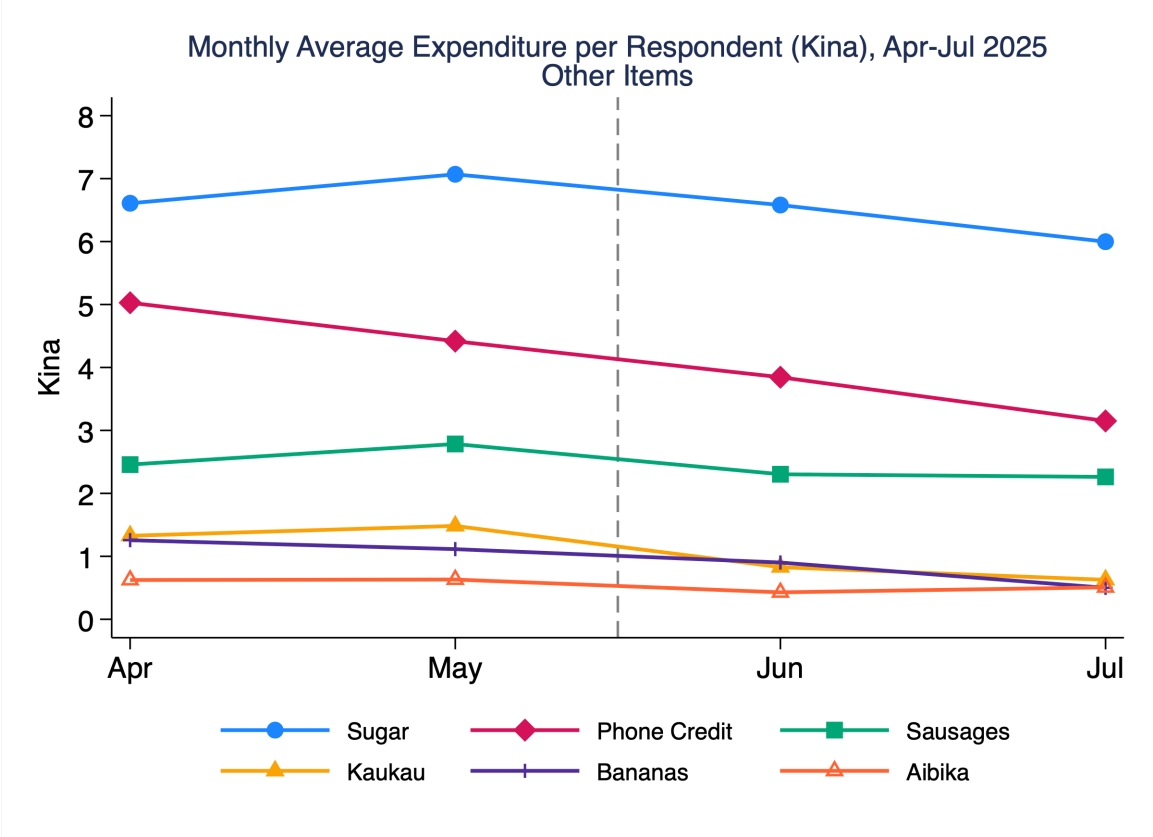


Figure A11: Average monthly expenditure on non-exempt items

Notes: This figure shows average monthly household expenditure on the non-exempt comparison items in the phone survey panel. Expenditure remains stable around the June 2025 reform date, consistent with the absence of meaningful substitution between exempt and non-exempt items (see Section 3.2).

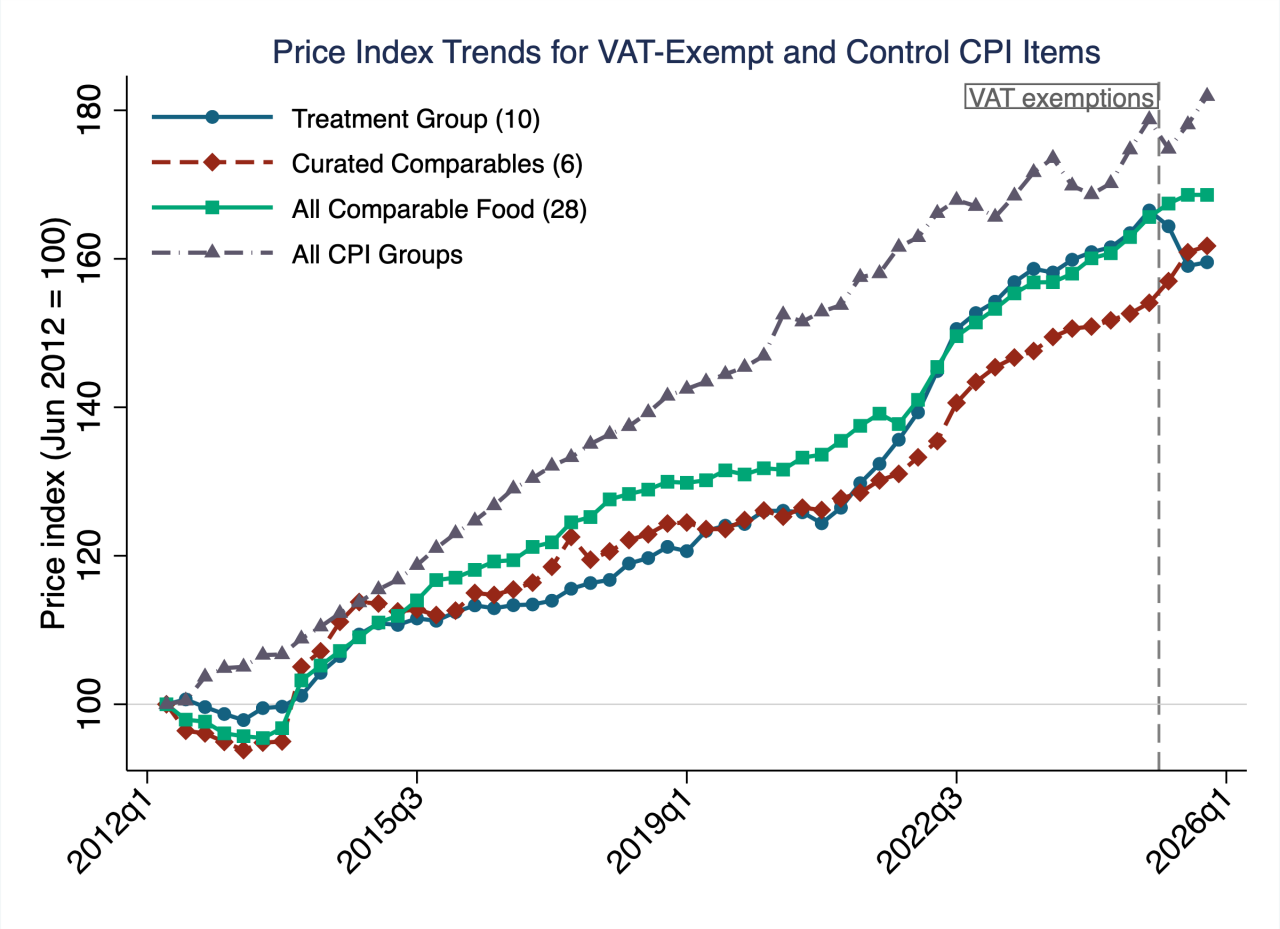


Figure A12: Raw trends in prices over the last 14 years according to NSO administrative data

Notes: This figure plots raw price trends over the last 14 years using aggregate NSO CPI data, covering all food items and the items in the treatment and control groups. It provides longer-run context for the pre-reform dynamics shown in Figure 3.

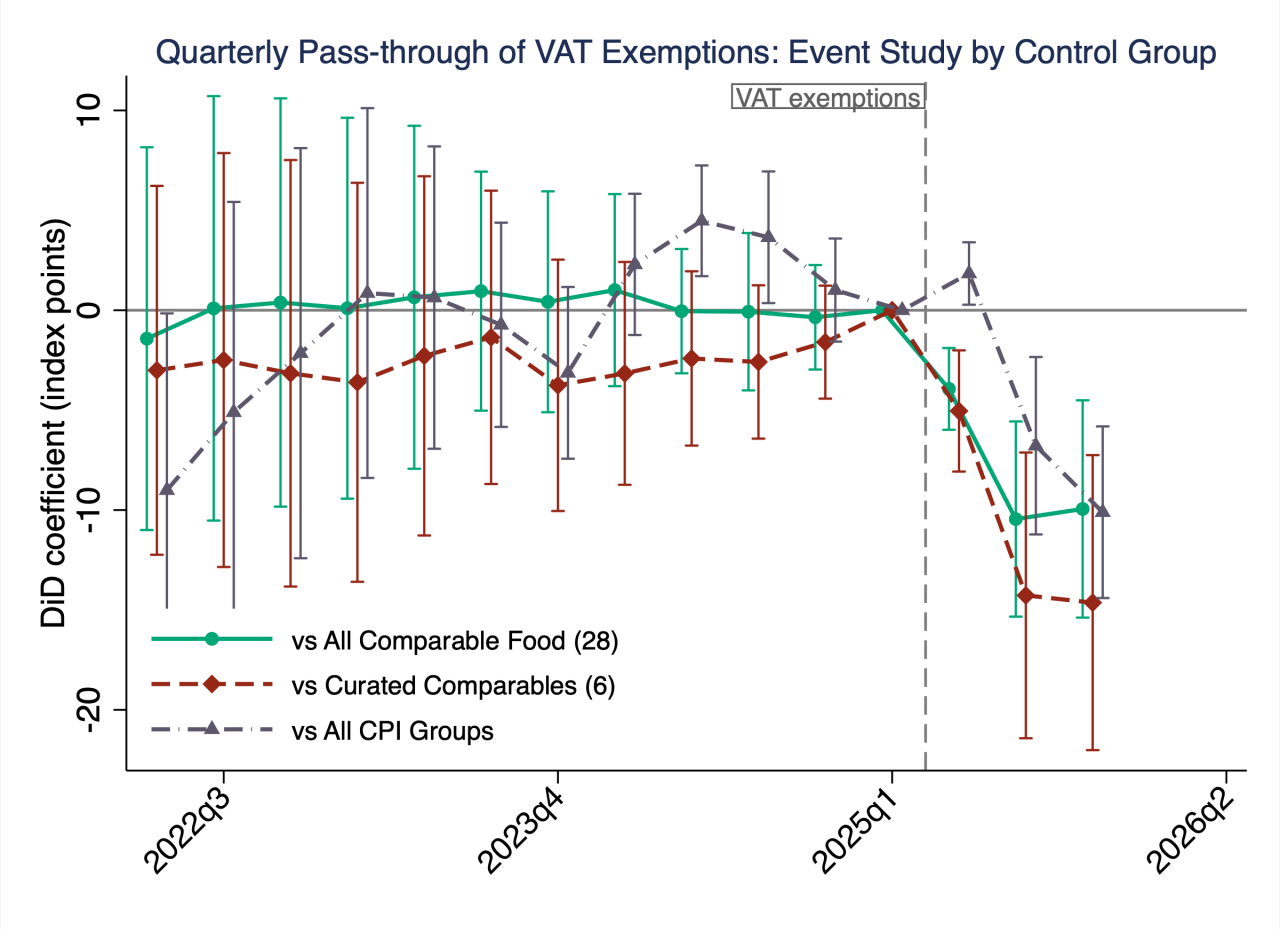


Figure A13: Difference-in-differences results with different comparison groups over the last four years according to NSO administrative data

Notes: This figure reports difference-in-differences estimates based on NSO administrative data over the last four years, comparing alternative comparison groups. The similarity of the estimates across comparison groups indicates that the main results are robust to the choice of control items.

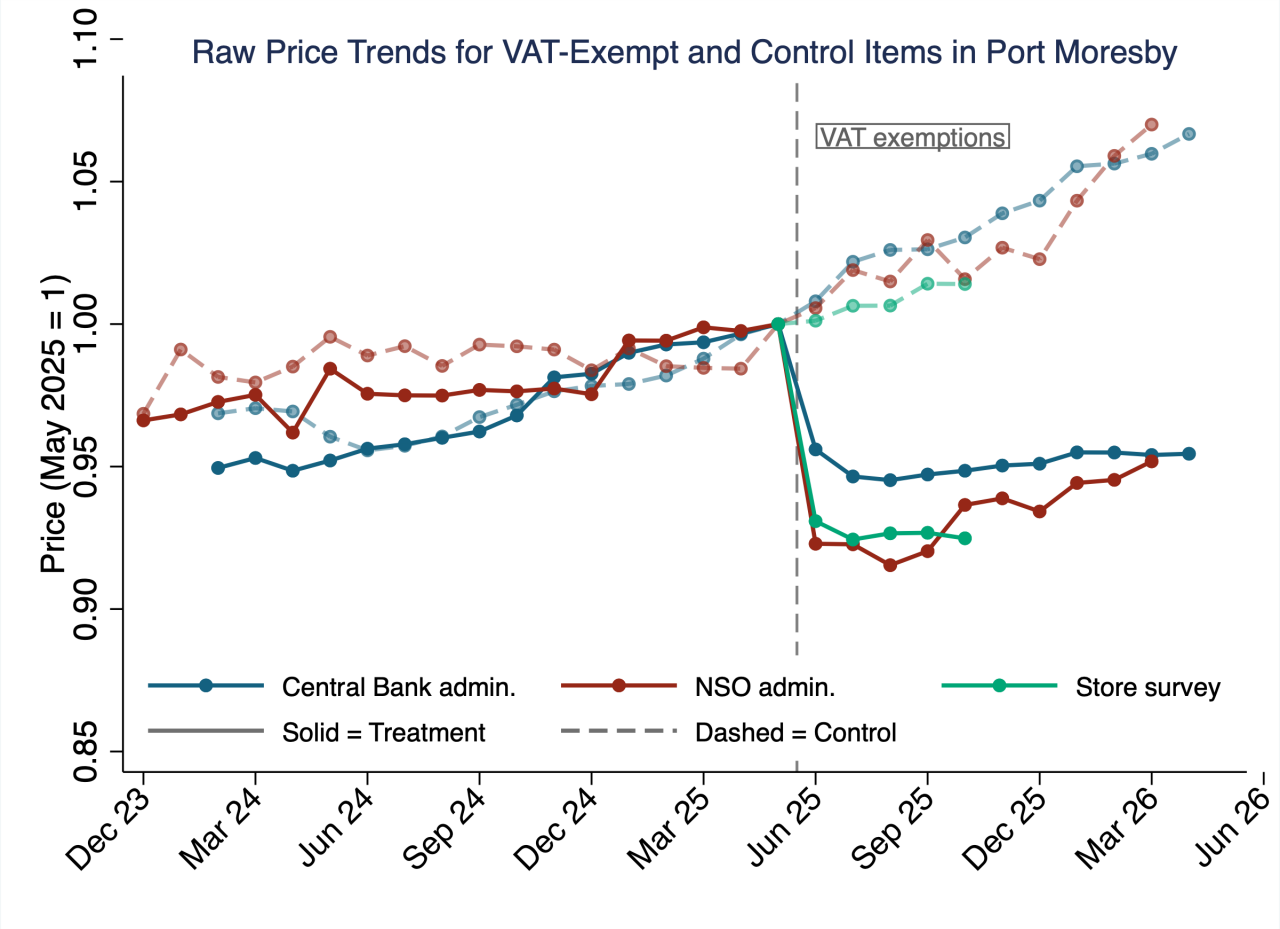


Figure A14: Raw trends of prices in Port Moresby by data source

Notes: This figure shows raw price trends for VAT-exempt (treatment) and non-exempt (control) items in Port Moresby by data source, including the census of all formal supermarkets, complementing the administrative data sources shown in Figure 3.

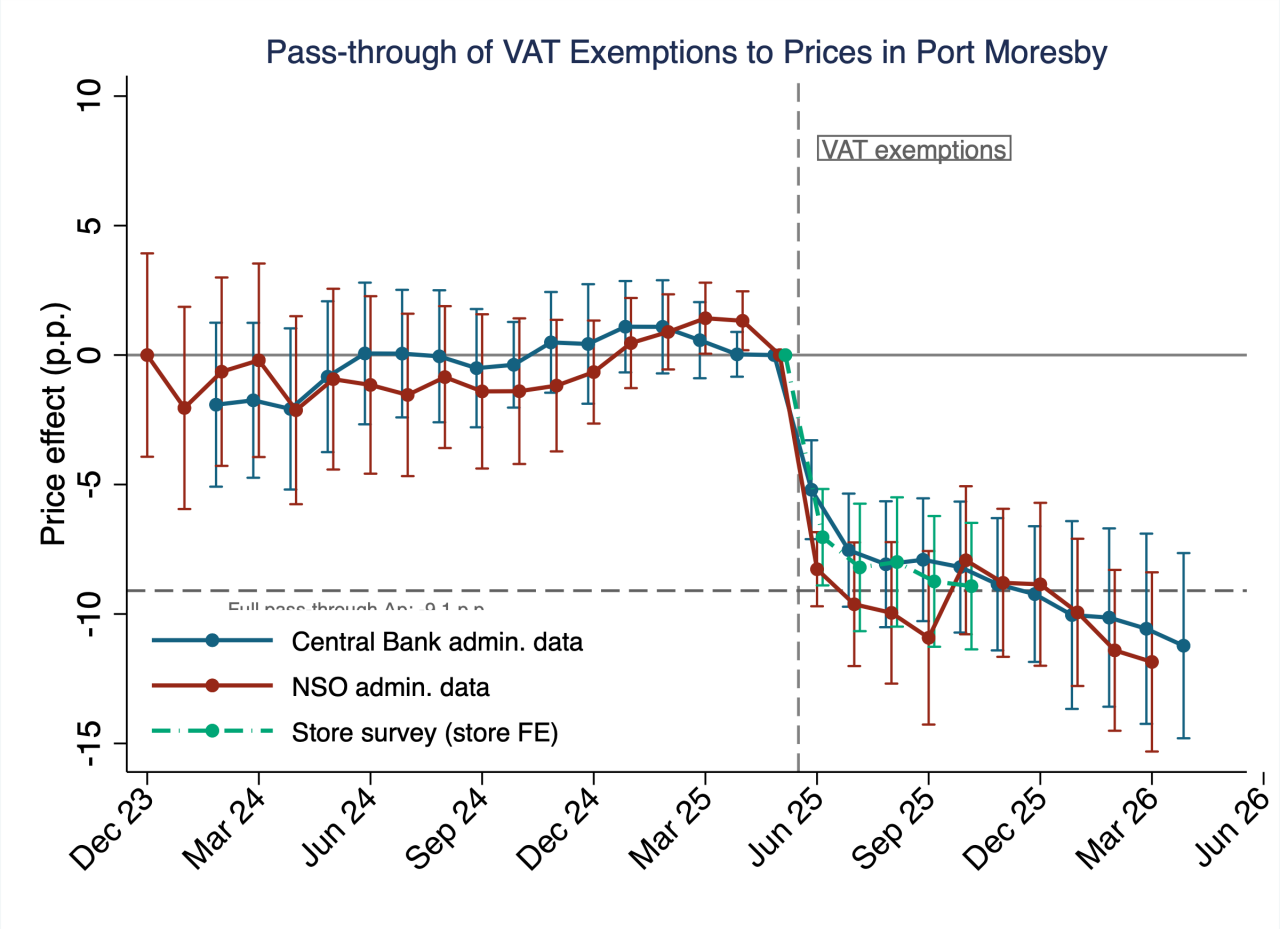


Figure A15: Pass-through of VAT exemptions to prices in Port Moresby by data source

Notes: This figure reports difference-in-differences estimates of the effect of the reform on prices in Port Moresby by data source, based on Equation 1. The similarity between the supermarket census and the administrative data indicates that the patterns in Figure 3 are not driven by the selection of supermarkets in the administrative data.

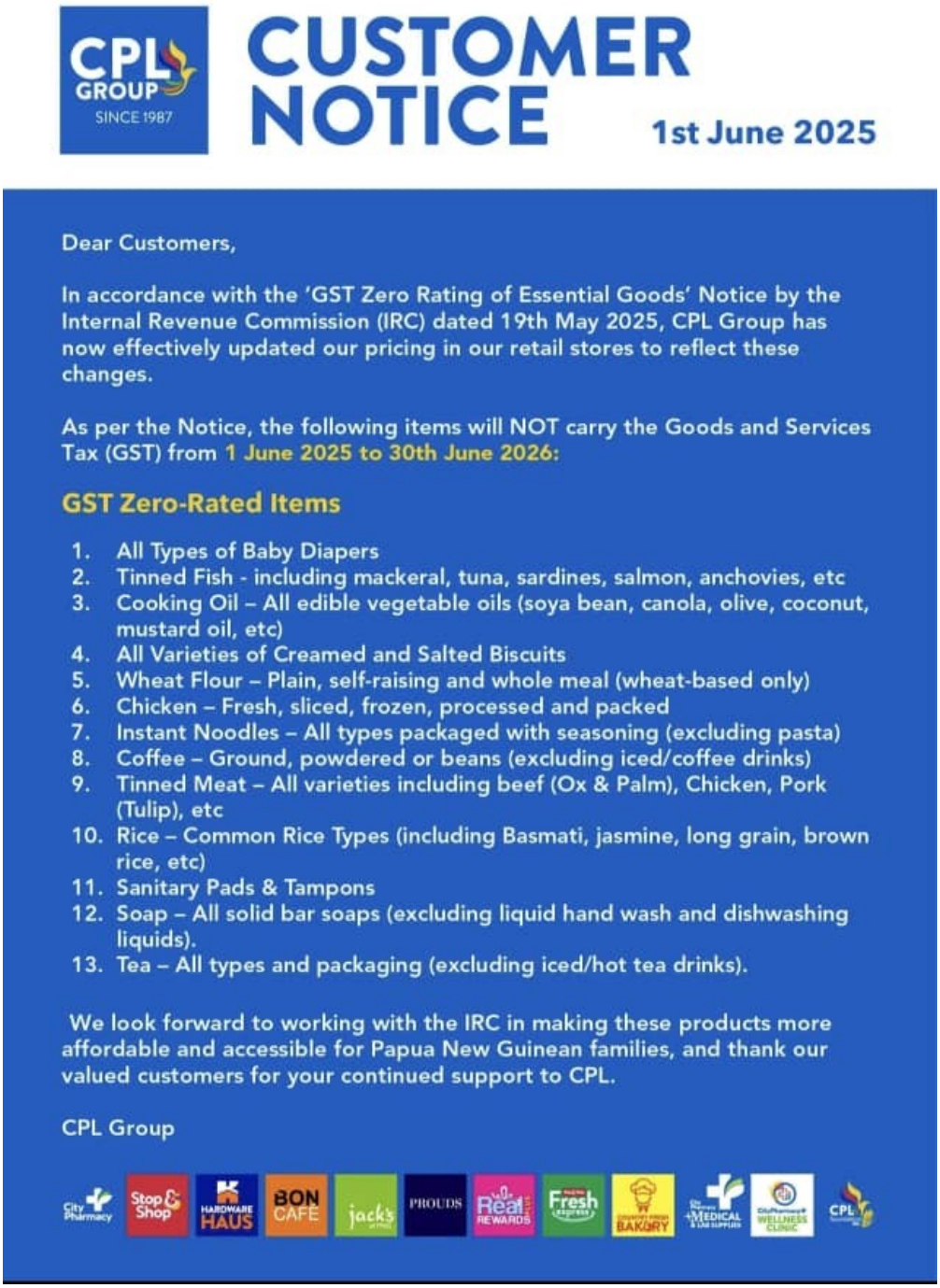


Figure A16: Advertisement from Stop and Shop

Notes: This figure presents a customer notice issued on 1 June 2025 by CPL Group, the owner of Stop and Shop, the largest supermarket chain, announcing that prices in its retail stores had been updated to reflect the GST zero rating.

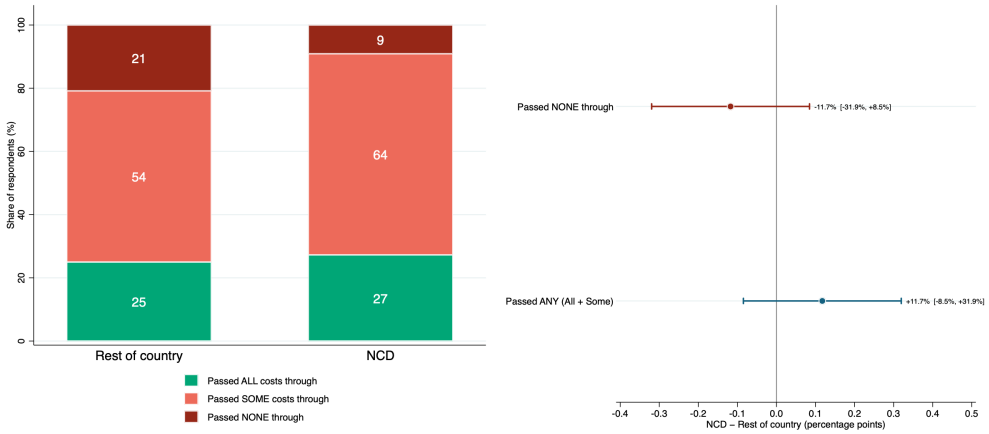


Figure A17: Results of pass-through question in business sentiment survey

Notes: This figure presents responses to a question about whether stores pass cost changes on to consumers, from the business sentiment survey of formal retail stores administered every six months by the Central Bank of PNG.

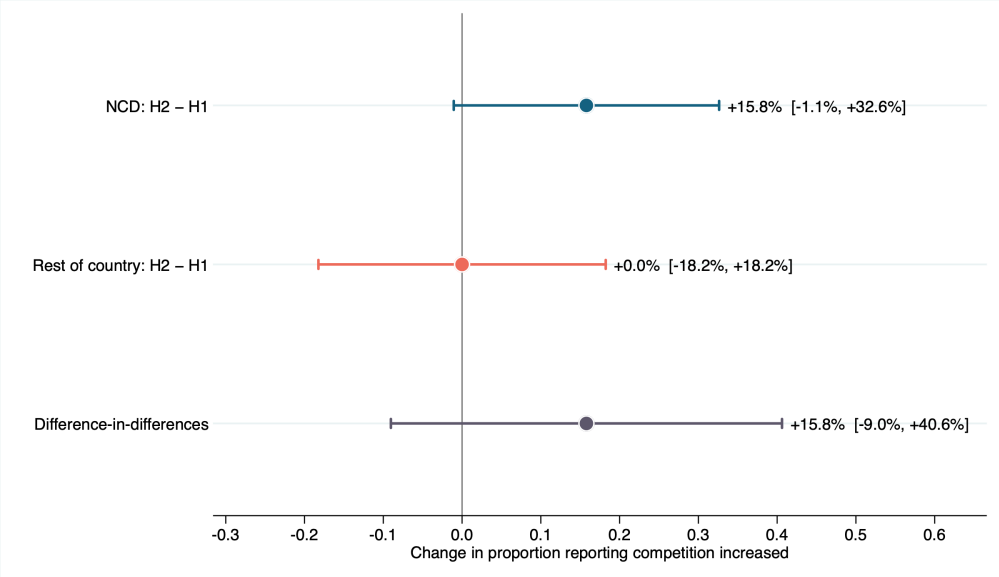
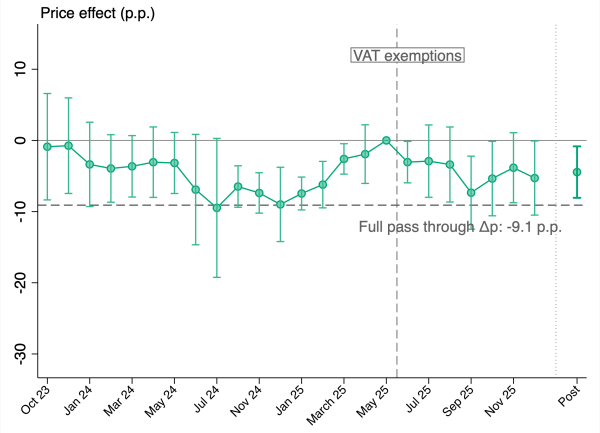


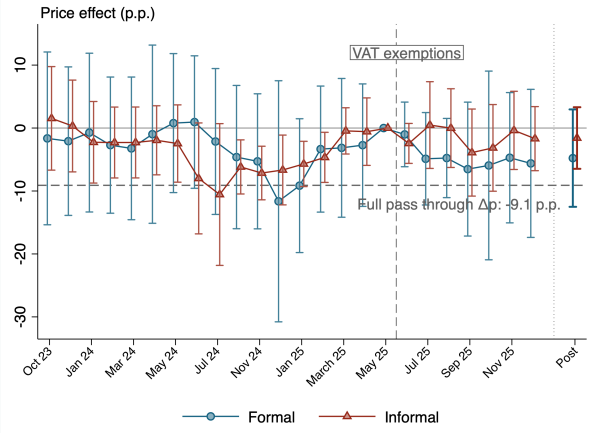
Figure A18: Results of competition question in business sentiment survey

Notes: This figure presents responses to a question about changes in the level of competition stores face, from the business sentiment survey of formal retail stores administered every six months by the Central Bank of PNG.

(a) Pass-through rate nationwide

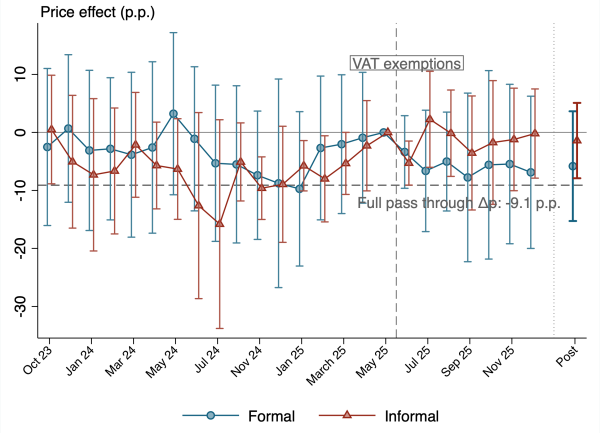


(b) Pass-through rate by store formality



Pass-through rate by store formality and area

(c) Urban areas



(d) Rural areas

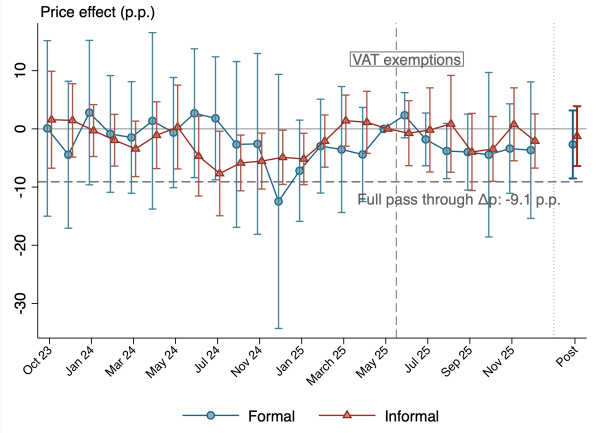


Figure A19: Pass-through nationwide based on the phone survey data

Notes: This figure reports difference-in-differences estimates using the nationally representative phone survey. Panel (a) shows the average pass-through nationwide. Panel (b) disaggregates by store formality. Panels (c) and (d) further split the results by urban and rural location. The vertical line marks the June 2025 reform, and the dashed horizontal line indicates full pass-through of the VAT removal.

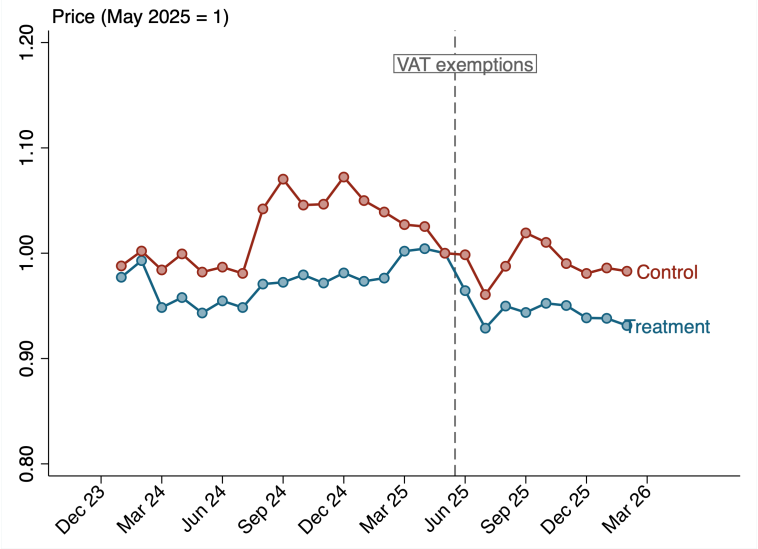


Figure A20: Raw trends in prices in treatment and control groups in the phone survey data

Notes: This figure shows raw trends in reported prices for the treatment and control groups in the phone survey panel from the end of 2023 onwards. It underlies the estimates reported in Table 2 and Figure A19.

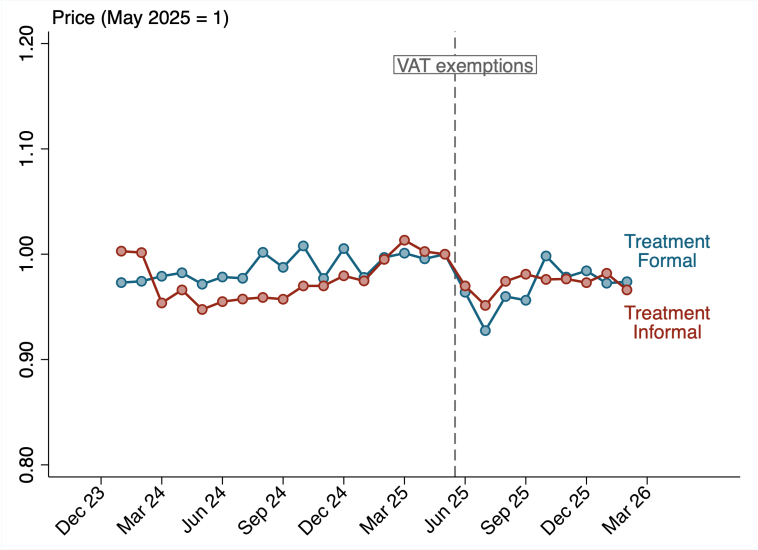


Figure A21: Raw trends in prices in treatment group between formal and informal stores in the phone survey data

Notes: This figure shows raw trends in reported prices for the treatment-group items, separately for purchases at formal and informal stores, in the phone survey panel from the end of 2023 onwards.

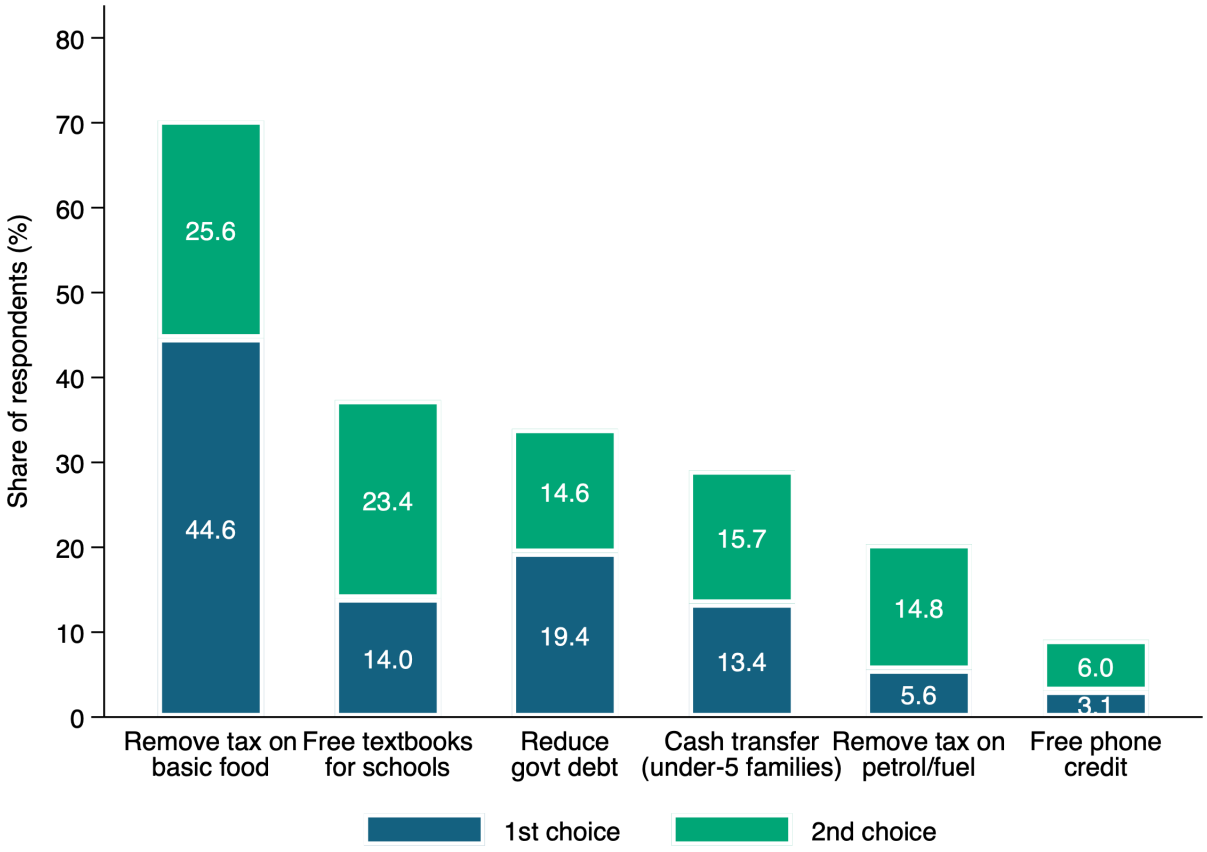


Figure A22: Preferences for alternative policies

Notes: This figure shows the results of a question about preferences for alternative policies asked in the April 2026 round of the phone survey. The exact wording was as follows (and respondents selected their first and second preference): "Imagine the government was considering introducing a program to support poor and middle-class families. In your view, which of the following would be the best way to support poor and middle-class families? provide a cash transfer for all families with children under the age of five; remove taxes from basic food items sold in supermarkets; remove taxes from petrol and other fuels; provide free textbooks for schools; provide a small amount of free phone credit for all phone users; reduce the level of government debt."

Table A4: Treatment effects on support for removing the tax on food items, by prior policy preference

Subgroup	N	Unweighted (robust SE)	Weighted (robust SE)
Overall (ATE)	995	-0.119^{*} (0.063)	-0.106 (0.091)
Preferred way to support households (April 2026):			
Prefers removing food tax	340	$+0.049$ (0.113)	$+0.186$ (0.151)
Prefers another policy	412	-0.230^{**} (0.090)	-0.285^{**} (0.119)
Another policy, by type:			
Cash transfer (under-5s)	86	-0.796^{***} (0.200)	-0.914^{***} (0.288)
Reduce government debt	152	-0.036 (0.151)	-0.207 (0.213)
Free textbooks	109	-0.285^{*} (0.173)	-0.199 (0.197)
Remove tax on fuel	46	$+0.200$ (0.262)	-0.019 (0.242)
Free phone credit	19	–	–
Interaction tests:			
Prefers food tax × Treat		$+0.286^{**}$ (0.143)	$+0.467^{**}$ (0.192)
Prefers cash × Treat		-0.775^{***} (0.212)	-0.927^{***} (0.311)
Joint test, all groups (F)		$p = 0.007$	$p = 0.049$

Notes: The outcome is support for removing the tax on selected food items, on a 1–5 scale (5 = strongly support; control-group mean 3.76). Cells report subgroup average treatment effects, conditioning on the orthogonal question-version indicator, with heteroskedasticity-robust (HC1) standard errors in parentheses. The unweighted estimates (preferred specification) are shown alongside weighted estimates that apply the household survey weights as a robustness check. Treatment was randomly assigned in the May 2026 round ($N = 995$); respondents' preferred way to support households is taken from the same households' April 2026 responses, which restricts the heterogeneity analysis to the 752 households observed in both rounds. The interaction rows report the treatment × moderator coefficient (food tax versus all other preferences; cash transfer versus all others); the final row reports the p-value of a joint F-test across the six preference groups. The smallest group (free phone credit) is too small to estimate separately but is retained in the joint test. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A5: Background information about expert prediction survey

Finished (%)	72.38
Median duration (minutes)	10.20
Researcher (%)	65.08
Economics (%)	58.78
Research experience in:	
Public Finance (%)	49.62
Tax Incidence (%)	31.30
Development (%)	58.78
Industrial Organization (%)	14.50
Low-middle income countries (%)	61.90
Number of responses	181
Number of complete responses	131

Notes: This table reports background characteristics of participants in the expert prediction survey hosted on the Social Science Prediction Platform between July and September 2025.

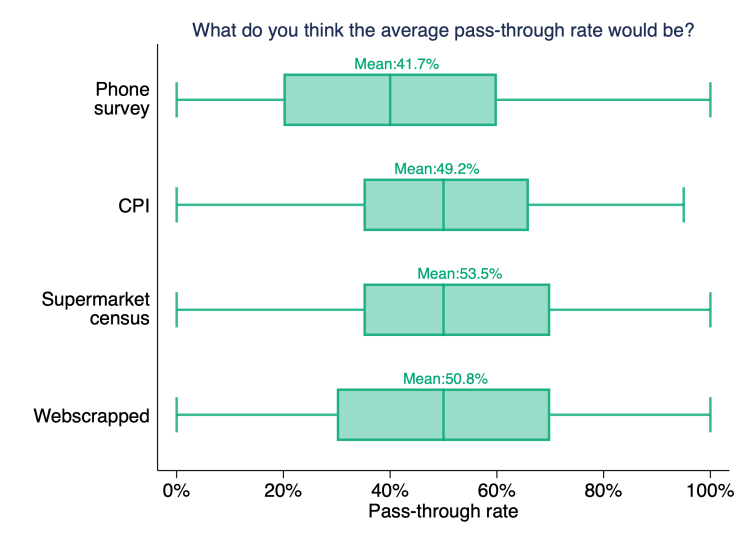


Figure A23: Experts' predictions of pass-through by data source

Notes: This figure shows experts' predicted pass-through rates for each of the four data sources used in this study. Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.



Figure A24: Experts' predictions of variation in pass-through

Notes: This figure shows experts' predictions of the extent of variation in pass-through rates across the 10 zero-rated food items. Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

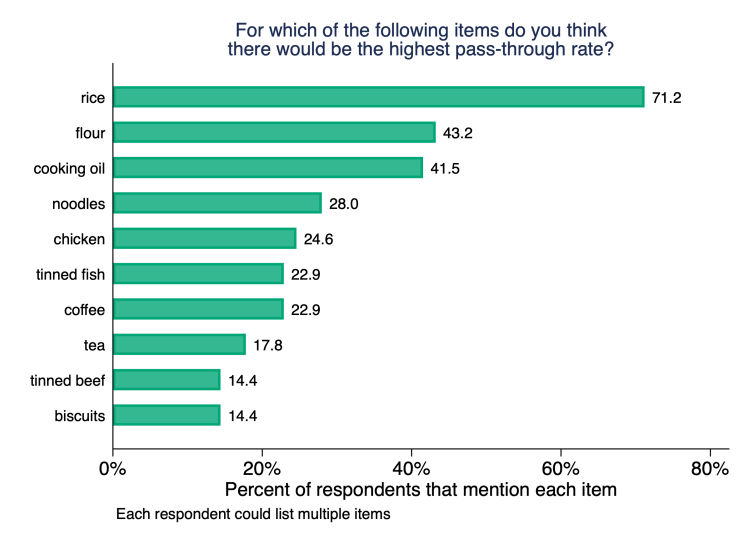


Figure A25: Experts' predictions of items with high pass-through

Notes: This figure shows the items that experts expected to have the highest pass-through rate. Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

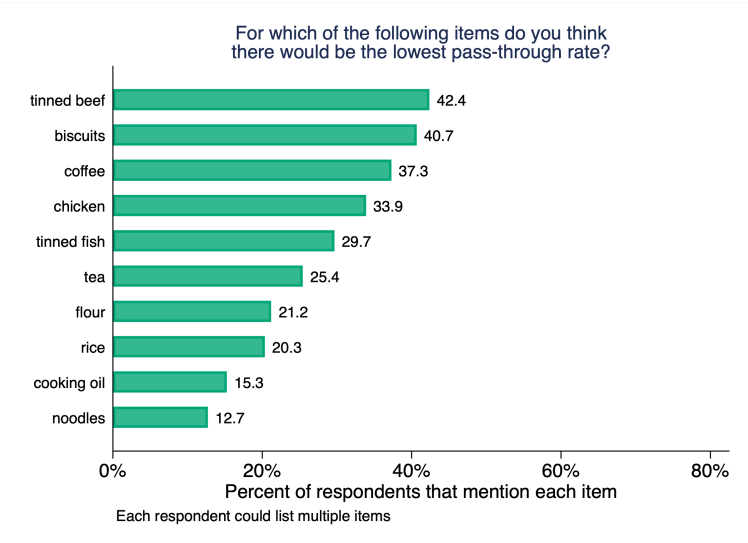


Figure A26: Experts' predictions of items with low pass-through

Notes: This figure shows the items that experts expected to have the lowest pass-through rate. Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

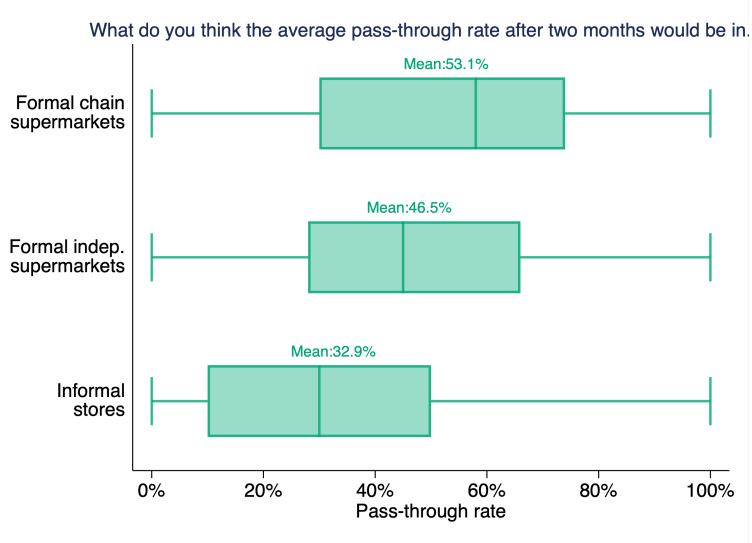


Figure A27: Experts' predictions of pass-through by store type

Notes: This figure shows experts' predicted pass-through rates by store type. Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

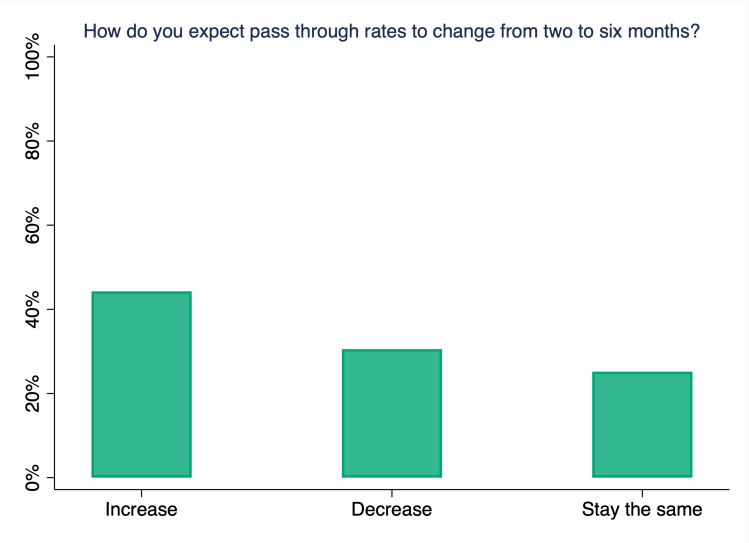


Figure A28: Experts' predictions of changes in pass-through over time

Notes: This figure shows experts' predictions of how pass-through rates would evolve over time. Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

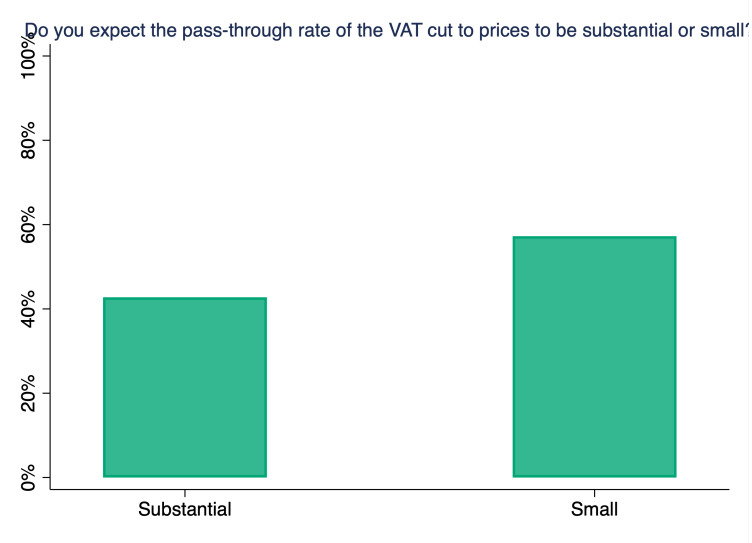


Figure A29: Experts' predictions of size of pass-through

Notes: This figure summarizes experts' predictions of the magnitude of pass-through. Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

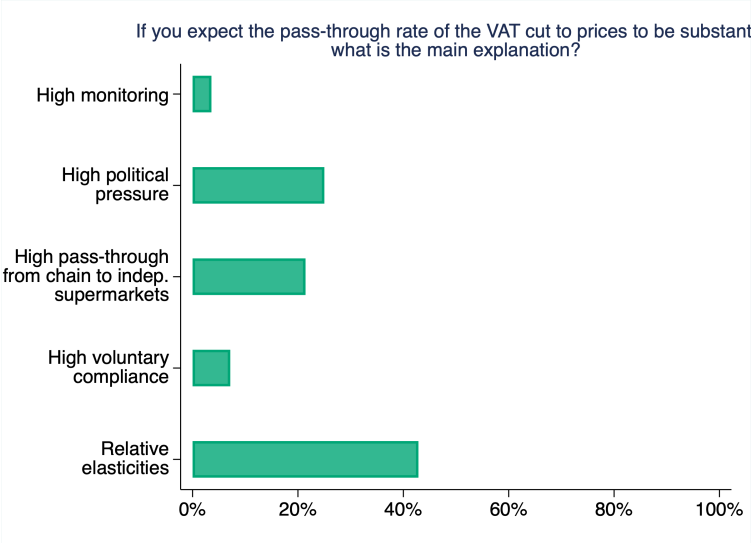


Figure A30: Experts' reasons for substantial pass-through

Notes: This figure shows the reasons experts selected for expecting substantial pass-through. Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

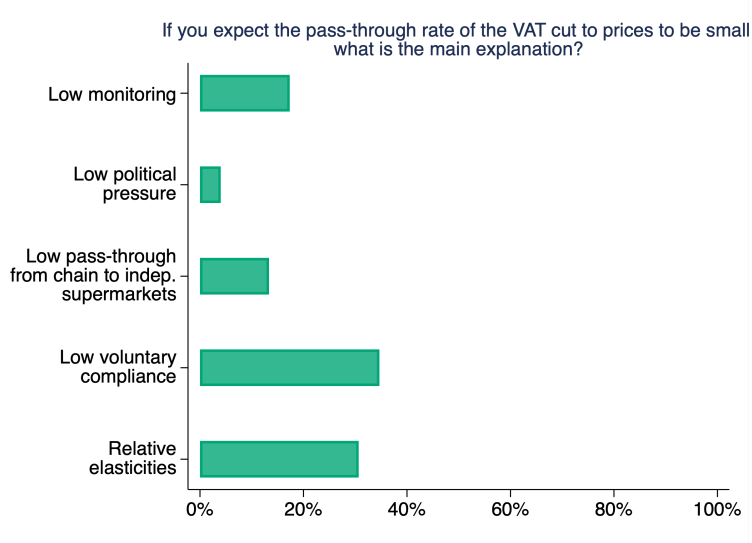


Figure A31: Experts' reasons for small pass-through

Notes: This figure shows the reasons experts selected for expecting small pass-through. Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

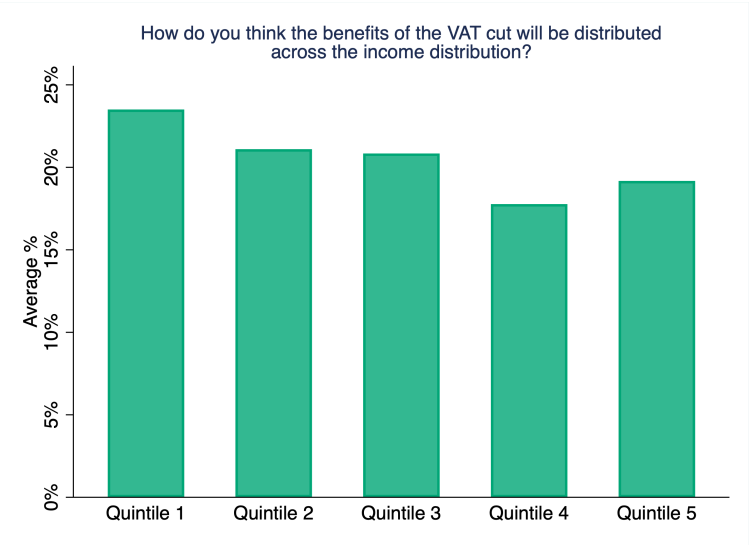


Figure A32: Experts' predictions of incidence of reform by quintile

Notes: This figure shows experts' predictions of the share of foregone revenue accruing to each household expenditure quintile. Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

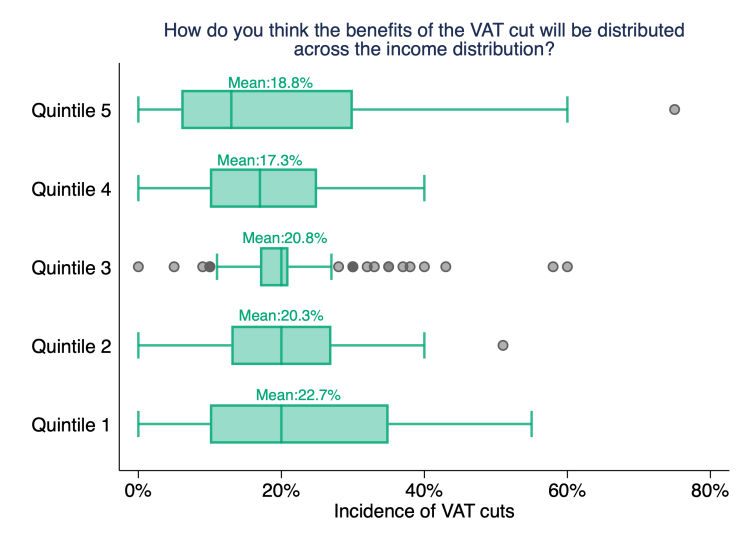


Figure A33: Experts' predictions of incidence of reform by quintile (boxplot)

Notes: This figure shows the distribution of experts' predicted shares of foregone revenue accruing to each household expenditure quintile, displayed as boxplots. Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

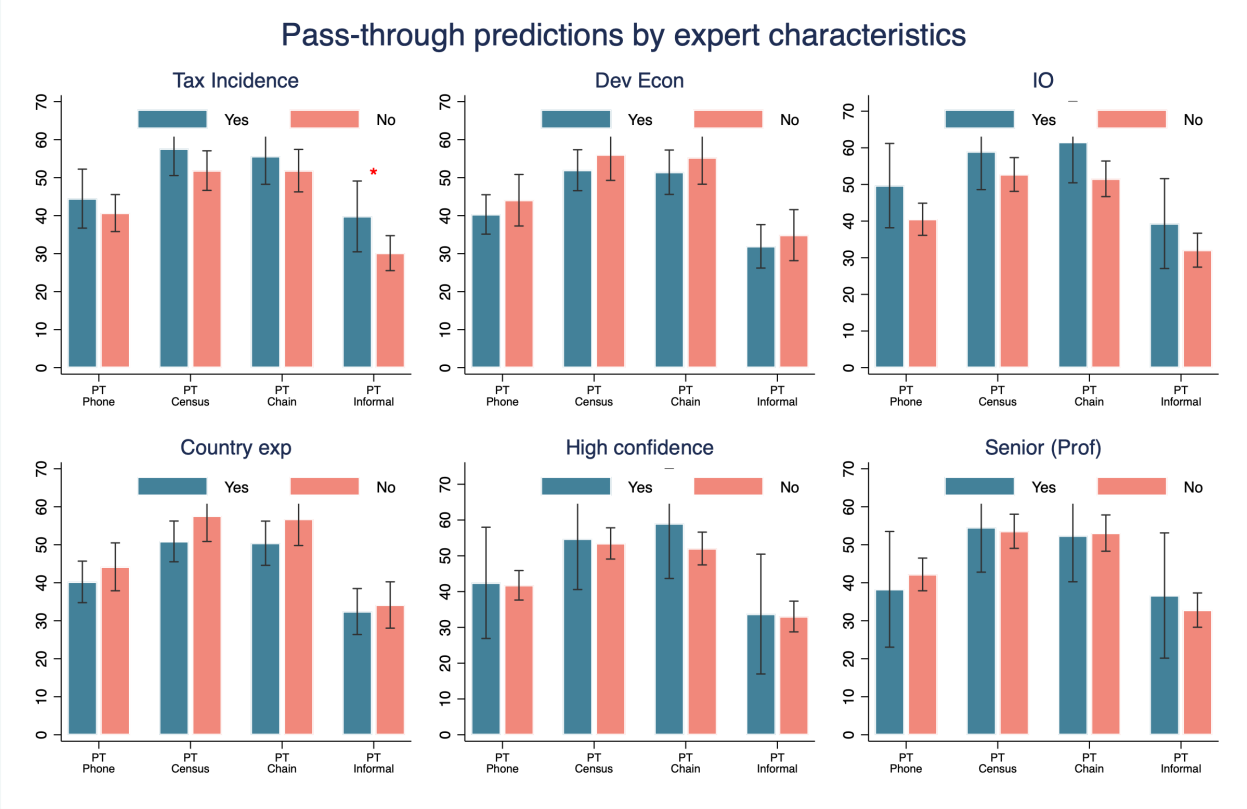


Figure A34: Heterogeneity in experts' predictions of pass-through

Notes: This figure shows how predicted pass-through varies across expert subgroups (by field, expertise, and experience). Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

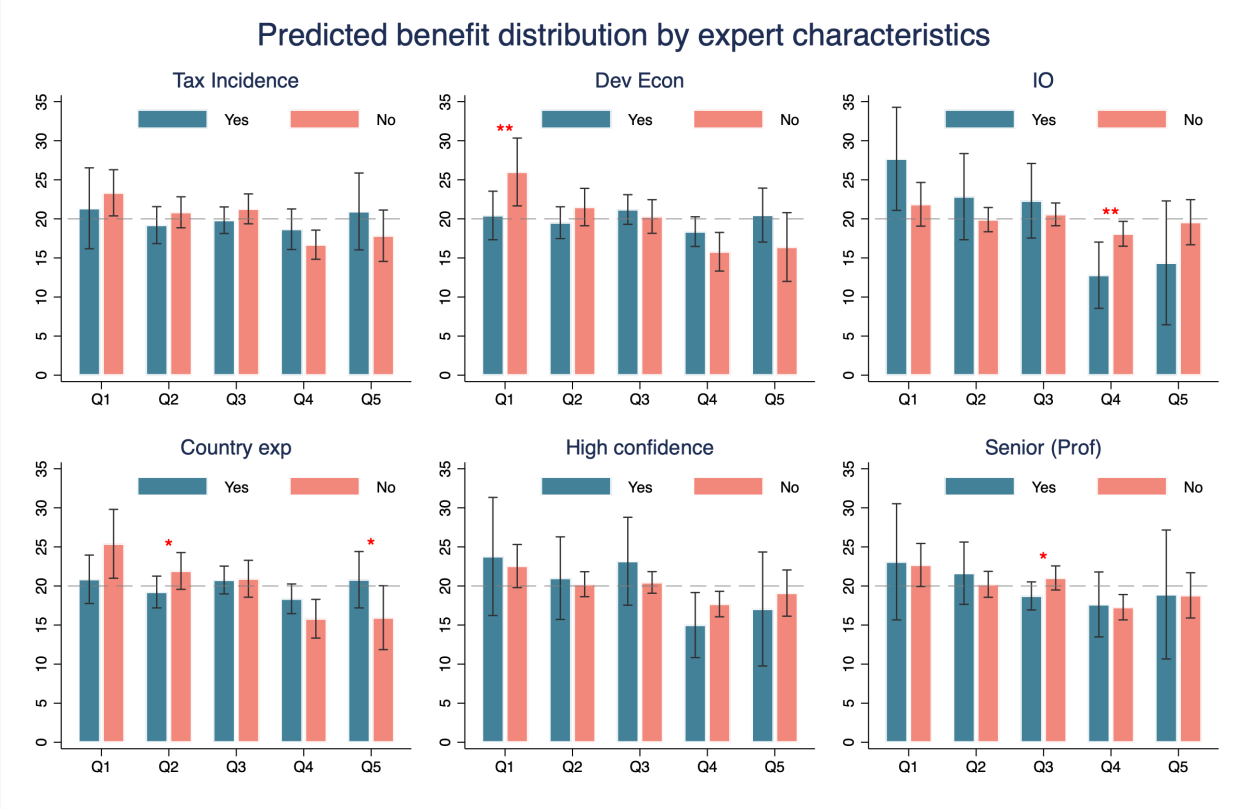


Figure A35: Heterogeneity in experts' predictions of incidence

Notes: This figure shows how predicted incidence varies across expert subgroups (by field, expertise, and experience). Predictions are from the expert prediction survey hosted on the Social Science Prediction Platform (SSPP) between July and September 2025.

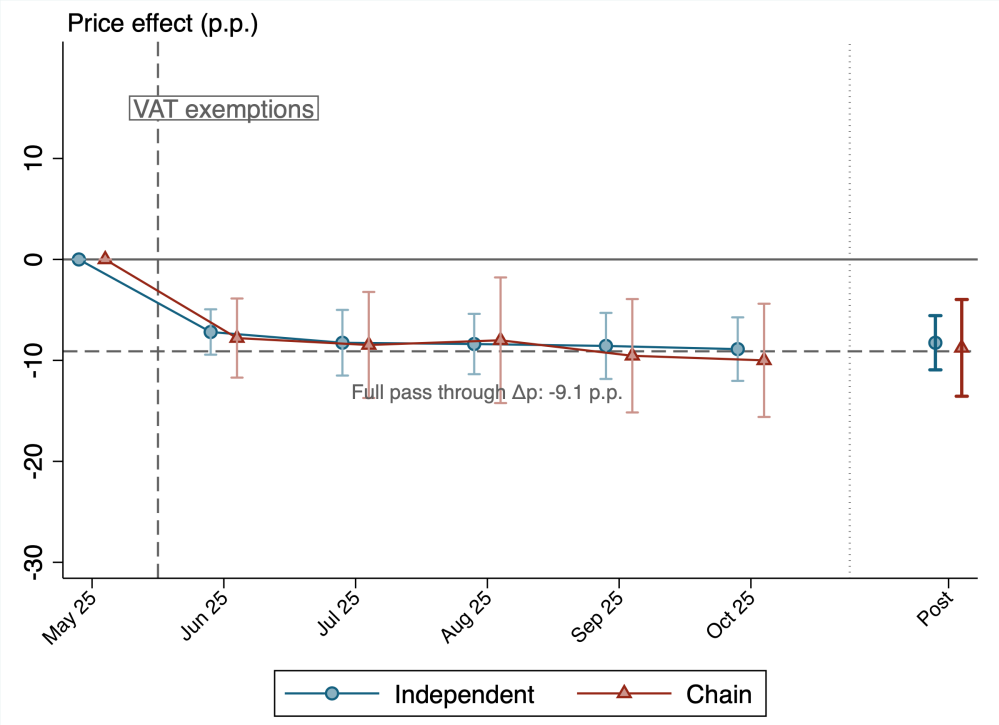


Figure A36: Difference-in-differences results by chain vs independent stores

Notes: This figure presents difference-in-differences event-study estimates from the supermarket census data (balanced panel), including the average of the post-reform coefficients (reference = May 2025), separately for chain and independent stores.

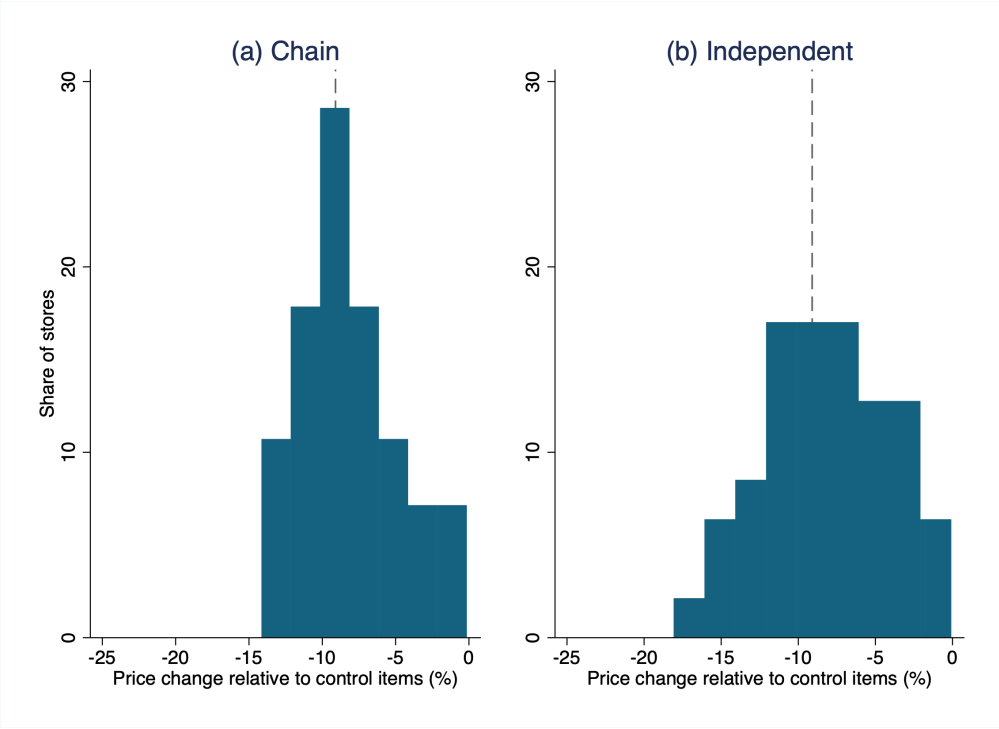


Figure A37: Heterogeneity of pass-through based on chain vs independent stores

Notes: This figure shows how the pass-through rate varies by chain vs independent stores, conducting the analysis outlined in Equation 1 using the supermarket census data.

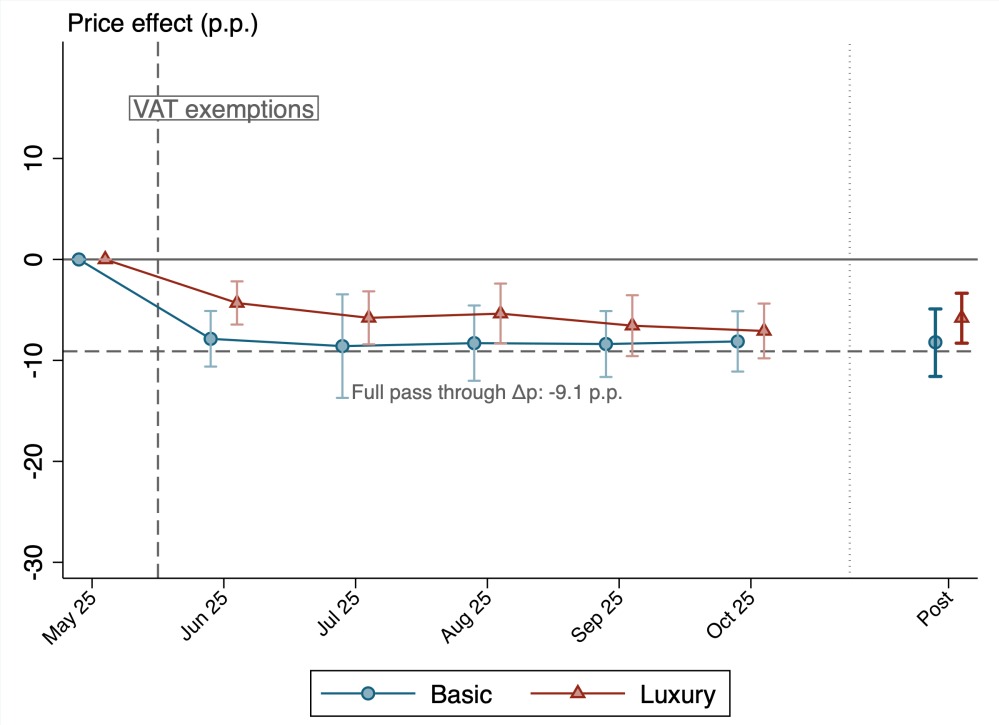


Figure A38: Difference-in-differences results by product type

Notes: This figure presents difference-in-differences event-study estimates from the supermarket census data (balanced panel), including the average of the post-reform coefficients (reference = May 2025), separately for basic and quasi-luxury products.

Appendix B – Formal decomposition of incidence

The visual decomposition in Figure 5 establishes that differential pass-through across stores contributes to the regressivity of the VAT exemption beyond consumption patterns alone. We now formalize this exercise: we write each of the three counterfactual incidence profiles as a restriction on Equation (2), summarise each profile by the concentration coefficient of consumer benefits — a Lorenz-curve statistic that supports the same additive decomposition — report bootstrap confidence intervals that reflect sampling uncertainty in both consumption patterns and pass-through, stress-test the result across alternative baseline assumptions, and bound it against measurement uncertainty in the noisiest cells of our data.

Setup. Let $\rho_{s,a,i} \equiv \text{PassThrough}_{s,a,i}$ denote the estimated pass-through of the VAT exemption to prices for item i at store type $s \in \{\text{Formal}, \text{Informal}\}$ in area $a \in \{\text{Urban}, \text{Rural}\}$. Let $\tau = 0.10$ denote the statutory VAT rate, and define the tax-inclusive VAT wedge as $m \equiv \tau/(1+\tau)$. Since P_i^0 is measured as the tax-inclusive pre-reform price, $m = 0.091$ is the maximum mechanical price reduction from fully removing VAT. The realized monetary benefit accruing to quintile q, corresponding to Equation (2), can be written as

$$B^{\text{Full}}(q) \;=\; \sum_{i \in I} \sum_{s \in S} \sum_{a \in A} \omega_{q,s,a,i} \left(\text{Quantity}_{q,i} \times P_i^0 \times m \times \rho_{s,a,i} \right), \tag{4}$$

where $\omega_{q,s,a,i}$ is the share of quintile-q purchases of item i that occur at store type s in area a, with $\sum_{s \in S} \sum_{a \in A} \omega_{q,s,a,i} = 1$ for each (q, i).

To isolate the contribution of each channel, we construct restricted pass-through schedules by collapsing $\rho_{s,a,i}$ across dimensions using nationally representative transaction weights $\pi_{s,a,i}$

from the phone survey:

$$\bar{\rho}_i = \sum_{s \in S} \sum_{a \in A} \pi_{s,a,i}\, \rho_{s,a,i} \qquad \text{(uniform across } s,\ a\text{)}, \tag{5}$$

$$\bar{\rho}_{s,i} = \sum_{a \in A} \pi_{a|s,i}\, \rho_{s,a,i} \qquad \text{(uniform across } a \text{ within } s\text{)}, \tag{6}$$

$$\bar{\rho}_{a,i} = \sum_{s \in S} \pi_{s|a,i}\, \rho_{s,a,i} \qquad \text{(uniform across } s \text{ within } a\text{)}, \tag{7}$$

where $\pi_{a|s,i} = \pi_{s,a,i} / \sum_{a'} \pi_{s,a',i}$ and $\pi_{s|a,i} = \pi_{s,a,i} / \sum_{s'} \pi_{s',a,i}$. Each restricted schedule is the transaction-weighted population mean of $\rho_{s,a,i}$ across the dimension being collapsed; alternative weighting choices are examined in Table B.3.

The three main counterfactual benefit profiles corresponding to the blue, green, and red lines in Figure 5 are then:

$$B^{C}(q) = \sum_{i \in I} \text{Quantity}_{q,i} \times P_i^0 \times m \times \bar{\rho}_i, \tag{8}$$

$$B^{C+F}(q) = \sum_{i \in I} \sum_{s \in S} \Big(\sum_{a \in A} \omega_{q,s,a,i} \Big) \text{Quantity}_{q,i} \times P_i^0 \times m \times \bar{\rho}_{s,i}, \tag{9}$$

$$B^{C+F+L}(q) = \sum_{i \in I} \sum_{s \in S} \sum_{a \in A} \omega_{q,s,a,i} \left(\text{Quantity}_{q,i} \times P_i^0 \times m \times \rho_{s,a,i} \right) = B^{\text{Full}}(q). \tag{10}$$

For the Shapley decomposition below, we also construct the analogous counterfactual that introduces location but not store formality:

$$B^{C+L}(q) = \sum_{i \in I} \sum_{a \in A} \Big(\sum_{s \in S} \omega_{q,s,a,i} \Big) \text{Quantity}_{q,i} \times P_i^0 \times m \times \bar{\rho}_{a,i}. \tag{11}$$

In B^C, every household faces the same item-specific pass-through schedule $\bar{\rho}_i$, so quintile-level variation operates only through differences in observed quantities purchased. In B^{C+F}, the formality margin is reintroduced through the term $\sum_a \omega_{q,s,a,i}$, which captures the quintile-specific propensity to purchase item i from formal versus informal stores. In B^{C+L}, the

location margin (which proxies for differences in competition) is reintroduced through the term $\sum_s \omega_{q,s,a,i}$, which captures the quintile-specific propensity to purchase item i in urban versus rural areas. In B^{C+F+L}, the full location-by-formality pass-through schedule applies. Throughout, Quantity$_{q,i}$, P_i^0, and $\omega_{q,s,a,i}$ are held at their observed values; only the pass-through schedule ρ varies across counterfactuals. The exercise is therefore a partial-equilibrium accounting decomposition, not a re-optimisation: households are not allowed to substitute across items or stores when pass-through changes.

Regressivity statistic. We summarise each counterfactual profile by the between-quintile concentration coefficient of consumer benefits, with households ranked by income. Let $s_q^k = B^k(q)/\sum_{q'} B^k(q')$ denote quintile q's share of total benefits under schedule $k \in \{C,\ C{+}F,\ C{+}L,\ C{+}F{+}L\}$, and let $L^k(p_q) = \sum_{j \le q} s_j^k$, $p_q = q/5$, be the implied concentration curve. With five equal-mass, income-ranked groups,

$$CC^k \;=\; 1 - \frac{1}{5}\sum_{q=1}^{5}\left[L^k(p_{q-1}) + L^k(p_q)\right] \;=\; \frac{2\sum_{q=1}^{5} q\, s_q^k - 6}{5}. \tag{12}$$

An equal absolute split across quintiles corresponds to $CC^k = 0$; positive values indicate that benefits are pro-rich in absolute terms, and larger values indicate greater regressivity. The common tax wedge m is included in the dollar-benefit calculations above but cancels out of Equation (12) because it is common across quintiles and counterfactuals.

Because CC^k is a linear functional of every interior ordinate of the concentration curve, it registers redistribution anywhere in the benefit distribution. This matters here: moving from B^{C+F} to the full schedule reallocates benefits mainly among the upper quintiles — the richest quintile's share of benefits rises from 0.35 to 0.39 and the concentration curve shifts downward at every interior cutoff — movements that a summary based on any single point of the curve would understate.

Additive decomposition. Total regressivity, CC^{C+F+L}, admits the sequential additive decomposition

$$\underbrace{CC^{C+F+L}}_{\text{Total}} = \underbrace{CC^{C}}_{\Delta\,\text{Consumption}} + \underbrace{\left(CC^{C+F} - CC^{C}\right)}_{\Delta\,\text{Informality}} + \underbrace{\left(CC^{C+F+L} - CC^{C+F}\right)}_{\Delta\,\text{Location}}. \tag{13}$$

Because Equation (13) is sequential, the attribution to the informality and location margins is order-dependent. We address this by also reporting Shapley contributions, which average the marginal contribution of each margin across both orderings consistent with consumption entering first:

$$\Delta^{Sh}_{\text{Informality}} = \tfrac{1}{2}\left[\left(CC^{C+F} - CC^{C}\right) + \left(CC^{C+F+L} - CC^{C+L}\right)\right], \tag{14}$$

$$\Delta^{Sh}_{\text{Location}} = \tfrac{1}{2}\left[\left(CC^{C+L} - CC^{C}\right) + \left(CC^{C+F+L} - CC^{C+F}\right)\right]. \tag{15}$$

Consumption is held as the first margin in both orderings because the analytical benchmark in this literature (Bachas et al., 2023) begins from observed consumption and progressively introduces market frictions.

Estimation. The cell-level pass-through schedule $\rho_{s,a}$ is estimated by fitting the event-study specification of Equation (1) separately within each store-type × area cell of the Table 2 sample (N = 129,921 price observations; 8 exempt and 8 comparison items, October 2023–May 2026, prices normalised to item-specific May 2025 means), summarising each cell by the simple average of the monthly post-reform coefficients (June 2025–May 2026) and converting to a pass-through rate by dividing by the mechanical price reduction of 9.1 percentage points, truncated to $[0, 1]$. Table B.1 reports the schedule. Household quintiles are formed at the household–wave level from the survey's income-decile variable (quintile = $\lceil \text{decile}/2 \rceil$), matching the construction underlying Figure 5; these are the quintiles referred

to as expenditure quintiles throughout the paper, as they reproduce the expenditure gradient shown in Figure A2. Household–waves without a recorded decile are excluded. The resulting formal purchase-share gradient is consistent with Section 2, rising from roughly 20 percent in the poorest quintile to over 40 percent in the richest. Baseline expenditures $\text{Quantity}_{q,i} \times P_i^0$ and the purchase-composition weights $\omega_{q,s,a,i}$ are measured over the baseline year (June 2024–May 2025), with ω weighted by expenditure and π by transactions; Table B.3 examines the alternative conventions.

Table B.1: Cell-level pass-through schedule $\rho_{s,a}$

Cell	$\hat{\beta}$ (p.p.)	(SE)	$\rho_{s,a}$
Formal, urban	−7.4	(6.0)	0.81
Informal, urban	0.3	(3.7)	0.00
Formal, rural	−0.8	(3.7)	0.09
Informal, rural	−1.1	(2.4)	0.13

Notes: Average post-reform coefficients from Equation (1) estimated within each store-type × area cell on the Table 2 sample; simple average of monthly event-study coefficients, June 2025–May 2026; standard errors clustered by product. $\rho_{s,a} = -\hat{\beta}/9.1$, truncated to $[0, 1]$. Sampling uncertainty in these estimates is propagated to all decomposition results through the bootstrap described below.

Inference. Confidence intervals cover sampling uncertainty in both consumption patterns and pass-through. We resample households — the survey sampling unit, and the unit at which consumption and price observations are linked — with replacement, and re-estimate the entire procedure within each of 515 replications: baseline expenditures, the composition weights ω and π, the May 2025 price normalisation, and all four cell-level difference-in-differences estimates; quintile assignment is a fixed survey category and does not vary across draws. Reported intervals are percentile intervals across replications.

Results. Table B.2 reports the decomposition and Figure B.1 plots the underlying concentration curves. Under the full schedule the concentration coefficient of benefits is $CC^{C+F+L} = 0.284$ (95% CI [0.181, 0.384]). Differences in consumption patterns alone generate $CC^{C} =$

0.199 [0.173, 0.224], or 70% of the total. Heterogeneous pass-through accounts for the remainder: sequentially, the informality margin contributes 0.059 (21%) and the location margin 0.026 (9%); the order-free Shapley attributions are 0.053 (19%) and 0.032 (11%) respectively. The two pass-through margins are individually imprecise, but their joint contribution, $CC^{C+F+L} - CC^{C} = 0.085$ [-0.009, 0.182], is positive in 96 percent of bootstrap replications: the data identify *that* pass-through heterogeneity adds materially to regressivity — roughly one third of the total — more confidently than *how* that addition splits between the informality and location margins.

Table B.2: Decomposition of the regressivity of consumer benefits

	Estimate	Bootstrap 95% CI	Share of total
CC^{C} (consumption only)	0.199	[0.173, 0.224]	
CC^{C+F} (+ informality)	0.258	[0.167, 0.329]	
CC^{C+L} (+ location)	0.237	[0.188, 0.314]	
CC^{C+F+L} (full schedule) = Total	0.284	[0.181, 0.384]	
ΔConsumption	0.199	[0.173, 0.224]	70%
ΔInformality (sequential)	0.059	[-0.018, 0.124]	21%
ΔLocation (sequential)	0.026	[-0.010, 0.082]	9%
Δ^{Sh}Informality	0.053	[-0.017, 0.112]	19%
Δ^{Sh}Location	0.032	[-0.004, 0.091]	11%

Notes: The table reports the between-quintile concentration coefficient of benefits with households ranked by income (Equation 12); an equal absolute split implies $CC = 0$ and total regressivity equals CC^{C+F+L}. Sequential contributions follow Equation 13 and Shapley contributions Equations 14–15. Confidence intervals are percentile intervals from 515 household-block bootstrap replications re-estimating all consumption weights and all four cell-level pass-through estimates in every draw.

Stress tests. Table B.3 recomputes the decomposition under alternative pass-through schedules, weighting conventions, quintile definitions, and item sets. Total regressivity is stable at $CC^{C+F+L} \approx 0.28$–0.29 across the pass-through and weighting variants (S1–S3, S6–S8, S10), including when the decomposition is evaluated at the pass-through values used to construct Figure 5 (S2). It rises when informal pass-through is set to zero (S4) and under expenditure-based quintiles (S9), and falls under item-specific pass-through (S11), where

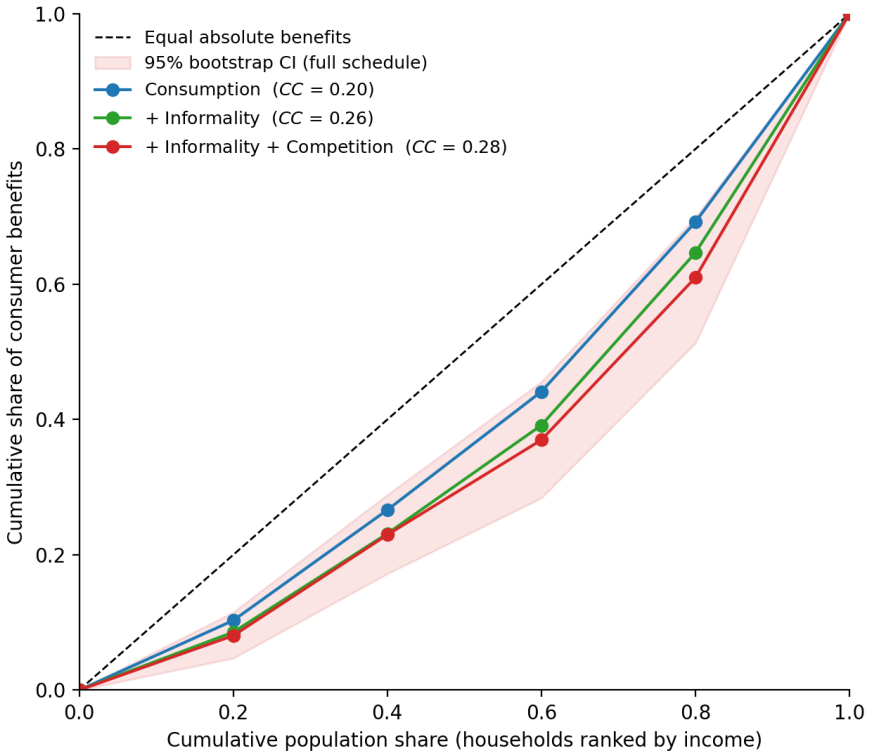


Figure B.1: Concentration curves of consumer benefits under each counterfactual pass-through schedule

Notes: Households are ranked by income on the horizontal axis. The dashed diagonal corresponds to equal absolute benefits per household. Solid lines plot the cumulative share of consumer benefits under each counterfactual schedule; the shaded band is the pointwise 95% bootstrap interval for the full schedule.

sampling noise in item-level estimates mechanically attenuates measured heterogeneity; S11 is therefore a conservative lower bound on the pass-through channels. Row S12 evaluates the decomposition under the exact construction of Figure 5 — household–wave cell-level expenditure over the full sample window, aggregated without the item dimension, at the pass-through values used in the figure — and yields $CC^{C} = 0.160$ and $CC^{C+F+L} = 0.229$ with the same roughly one-third pass-through share; the figure and the appendix thus agree on the decomposition while differing modestly in level through the expenditure window and item-level aggregation.

Table B.3: Stress tests: alternative pass-through, weighting, and quintile assumptions

Specification	Total	ΔCons.	Δ^{Sh}Inf.	Δ^{Sh}Loc.
S1 Baseline (re-estimated cells)	0.284	0.199	0.053	0.032
S2 Figure 5 pass-through schedule	0.291	0.200	0.065	0.026
S3 No truncation of rho at 0	0.286	0.199	0.056	0.031
S4 Informal pass-through = 0	0.356	0.203	0.092	0.061
S5 Uniform formal rho = 0.64	0.279	0.200	0.076	0.003
S6 Expenditure-weighted pi	0.284	0.199	0.045	0.039
S7 Transaction-weighted omega	0.287	0.199	0.050	0.038
S8 Household-level income quintiles	0.290	0.191	0.047	0.052
S9 Expenditure-based quintiles	0.409	0.309	0.049	0.052
S10 All 10 exempt items	0.292	0.197	0.045	0.050
S11 Item-specific rho (truncated)	0.238	0.187	0.043	0.007
S12 Exact Figure 5 construction	0.229	0.160	0.025	0.044

Notes: Each row recomputes the full decomposition under one alternative assumption, holding all other elements at baseline. S2 evaluates the pass-through values used to construct Figure 5. S11 replaces cell-level pass-through with item-specific estimates (truncated to $[0, 1]$) where the item–cell sample permits estimation, with pooled cell-level values elsewhere.

Bounds for the noisiest cells. The formal–urban cell is precisely pinned down and the informal–urban cell is a precisely estimated zero; the two rural cells are the noisiest decision-relevant inputs. Table B.4 replaces each rural cell's pass-through with the endpoints of its 95% confidence interval (truncated to $[0, 1]$), one at a time and jointly. Total regressivity remains positive and economically large throughout, ranging from 0.16 to 0.37, and the

combined pass-through contribution is robust except at the extreme upper bound of rural-informal pass-through, where near-complete rural pass-through compresses the scope for heterogeneity. As anticipated, the object that is sensitive to the rural cells is the *split* between the informality and location margins, not the total or the joint pass-through contribution; the row evaluating the rural–formal cell at the value implied by the published Table 2 coefficient lies well inside these bounds.

Table B.4: Bounds against measurement uncertainty in the noisiest cells

Cell varied	Bound	ρ	Total	Δ^{Sh}Inf.	Δ^{Sh}Loc.
F–R	lower	0.00	0.283	0.045	0.040
F–R	upper	0.90	0.286	0.082	0.002
I–R	lower	0.00	0.356	0.092	0.061
I–R	upper	0.65	0.171	-0.025	0.000
I–U	lower	0.00	0.284	0.053	0.032
I–U	upper	0.77	0.255	0.012	0.044
F–R and I–R jointly	$\rho_{FR} = 0.00$, $\rho_{IR} = 0.00$	–	0.373	0.091	0.079
F–R and I–R jointly	$\rho_{FR} = 0.00$, $\rho_{IR} = 0.65$	–	0.162	-0.035	0.002
F–R and I–R jointly	$\rho_{FR} = 0.90$, $\rho_{IR} = 0.00$	–	0.312	0.101	0.008
F–R and I–R jointly	$\rho_{FR} = 0.90$, $\rho_{IR} = 0.65$	–	0.218	0.028	-0.008
F–R at published value	$\rho_{FR} = 0.25$	0.25	0.285	0.063	0.022

Notes: Each row replaces the indicated cell's pass-through with an endpoint of its 95% confidence interval (truncated to $[0, 1]$), holding other cells at baseline; the joint rows vary the two rural cells simultaneously. The formal–urban cell is held at its baseline value throughout.

Appendix C - Expert Prediction Survey

intro

Informality, Incidence, and Pass-through of VAT Exemptions

Summary of study

We are soliciting expert predictions about a project analyzing the pass-through and incidence of Value Added Tax (VAT) exemptions on food in a low-income setting with very high levels of informality. We draw on detailed administrative data, a panel of nationally representative phone surveys, data scraped from supermarket websites, and direct observation of food prices across all supermarkets in the largest city. To identify the extent of pass-through from a recent, unanticipated removal of VAT, we conduct a difference-in-differences analysis comparing price changes between food items that became exempt with those that did not. We examine the incidence of VAT exemptions across the income distribution and the role of informality, using the phone survey data that captures the price and volume of food purchases at formal and informal stores. We also examine variation in pass-through rates between different types of supermarkets in urban areas.

Setting of study

The study is set in Papua New Guinea (PNG), which shares many characteristics with other lower-income countries. There are very high levels of informality, with most of the over 10 million population living in rural areas and primarily relying on subsistence agriculture. Similar to many other lower-income countries (e.g., many Sub-Saharan African countries, Haiti, Laos), there is one major economic urban center (which is Port Moresby in Papua New Guinea) where the vast majority of VAT is collected. Outside of this urban center, there are relatively few supermarkets that are part of an established supply chain. Even in urban areas, independent

supermarkets often purchase stock from the shelves of chain supermarkets, as many do not have a reliable network of suppliers.

Details about VAT exemption reform

On June 1st, 2025, the PNG government introduced a VAT exemption reform that aimed to lower the prices of basic food options. The following 10 food items became zero-rated for VAT (i.e., a 10 percent VAT rate was no longer collected by the government):

- Cooking oil
- Rice
- Tinned fish
- Tea
- Flour
- Tinned beef
- Chicken
- Noodles
- Biscuits
- Coffee

The expected cost to the government is almost USD100 million a year in foregone revenue. Monitoring of the pass-through of VAT exemptions by supermarkets is the responsibility of the revenue authority (IRC) and the competition agency (ICCC). In addition, the PNG Government has made a series of public announcements to try to pressure supermarkets to fully pass through the VAT reduction to prices.

Details about the evaluation of reform

We conduct a difference-in-difference analysis comparing the change in price for the 10 zero-rated items with a comparable set of food items that are still subject to VAT and can be purchased at similar stores. These items are:

- Butter
- Kaukau (sweet potato)
- Tinned baked beans
- Broccoli
- Aibika (common leafy vegetable)
- Sugar
- Sausages
- Powdered milk
- Breakfast cereal
- Bananas
- Milo
- Salt

Data sources

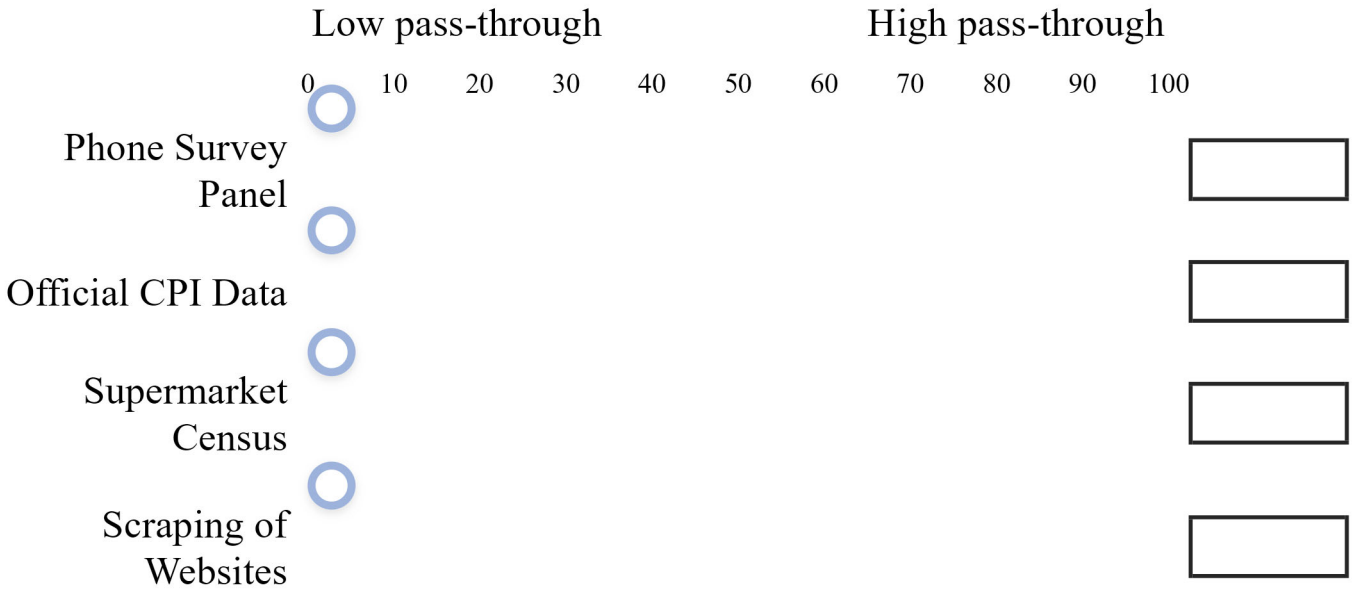
	Coverage	Store type	Other Limitations
Phone surveys panel	Nationwide	Informal + Formal	Self-reported
Official CPI data	Urban areas	Informal + Formal	Only a subset of locations
Supermarkets census	Port Moresby	Formal (Chain + Independent)	Limited pre-trends data
Scraping of websites	Port Moresby	Formal (Chain)	Only the largest chains

questions

We are interested in your predictions of the pass-through rate (i.e., the share of the tax cut that consumers receive via lower prices relative to the amount of tax foregone), and the incidence of the VAT exemptions reform in Papua New Guinea for each data source.

Pass through to prices

On a scale from 0% to 100%, where 0% represents no pass-through and 100% represents full pass-through, what do you think the average pass-through rate (as a percent) would be based on…



To what extent do you think there will be variation in pass-through rates between the 10 zero-rated food items?

- ○ No differences
- ○ Some differences
- ○ Substantial differences

For which of the following items do you think there would be the **highest** pass-through rate?

- [ ] Cooking oil
- [ ] Rice
- [ ] Tinned fish
- [ ] Tea
- [ ] Flour
- [ ] Tinned beef
- [ ] Chicken
- [ ] Noodles
- [ ] Biscuits
- [ ] Coffee

For which of the following items do you think there would be the **lowest** pass-through rate?

- [ ] Cooking oil
- [ ] Rice
- [ ] Tinned fish
- [ ] Tea
- [ ] Flour
- [ ] Tinned beef
- [ ] Chicken
- [ ] Noodles
- [ ] Biscuits
- [ ] Coffee

Heterogeneity

On a scale from 0% to 100%, where 0% represents no pass-through and 100% represents full pass-through, what do you think the average pass-through rate after two months would be in...

	Low pass-through 0 10 20 30 40 50 60 70 80 90 100 High pass-through
Formal stores, specifically chain supermarkets	☐
Formal stores, specifically independent supermarkets	☐
Informal stores (e.g., local markets)	☐

Additional questions

How do you expect pass through rates to change from two to six months?

- ○ Pass through rates increase
- ○ Pass through rates decrease
- ○ Pass through rates stay the same

Do you expect the pass-through rate of the VAT cut to prices to be substantial or small?

- ◯ Pass-through rate will be substantial
- ◯ Pass-through rate will be small

If you expect the pass-through rate of the VAT cut to prices to be **substantial**, what is the main explanation?

- ◯ Relative elasticities of supply and demand
- ◯ High voluntary compliance
- ◯ High pass-through from chain supermarkets to independent supermarkets
- ◯ High political pressure on stores
- ◯ High monitoring of stores

If you expect the pass-through rate of the VAT cut to prices to be **small**, what is the main explanation?

- ◯ Relative elasticities of supply and demand
- ◯ Low voluntary compliance
- ◯ Low pass-through from chain supermarkets to independent supermarkets
- ◯ Low political pressure on stores
- ◯ Low monitoring of stores

How do you think the benefits of the VAT cut will be distributed across the income distribution?

Note: the sum of values should add to 100%. For example, if you think every quintile will benefit equally, then please select 20% for each option, whereas if you think that only the poorest quintile will benefit, please select 100% for that quintile and 0% for the other four quintiles.

	Low Benefits 0 10 20 30 40 50 60 70 80 90 100 High Benefits	
Q1 (Poorest)		
Q2		
Q3 (Middle)		
Q4		
Q5 (Richest)		
Total:		

Please use the space below if you wish to briefly expand on any of your answers to the previous questions. (Optional)

additional

Do you have research experience in the following fields? Please select all that apply:

- ☐ Tax Incidence
- ☐ Public Economics
- ☐ Industrial Organization
- ☐ Development Economics

Have you conducted research in a low- or lower-middle income country?

- ○ Yes
- ○ No

SSPP_Questions

How confident are you in your predictions for this study? If you are confident, it means that you believe your predictions are very accurate.

- ○ Not at all confident
- ○ Slightly confident
- ○ Somewhat confident
- ○ Very confident
- ○ Extremely confident

If you have any comments, please enter them below. We would love to hear your feedback.

SSPP_Demographics_v3

Are you currently a PhD student, postdoc, faculty, or non-academic researcher?

- ◯ Yes
- ◯ No

Which of the following best describes you?

- ◯ PhD student
- ◯ Postdoc
- ◯ Faculty
- ◯ Researcher in a thinktank, government agency, or other organization
- ◯ Operations officer or other policy position

What is your discipline?

- ◯ Economics
- ◯ Management
- ◯ Political Science
- ◯ Psychology
- ◯ Public Policy
- ◯ Sociology
- ◯ [ ] Other

What is your primary research institution?

Other
Aalborg University
Aalto University
Aarhus University
Aberystwyth University
Åbo Akademi University
Adam Mickiewicz University in Poznań
AGH University of Science and Technology
Ain Shams University
Aix-Marseille University

What is your sector?

- [ ] Agriculture
- [ ] Architecture And Engineering
- [ ] Arts And Design
- [ ] Banking
- [ ] Computer And Information Technology
- [ ] Consulting
- [ ] Economics
- [ ] Education, Training, And Library
- [ ] Federal Government
- [ ] Financial Services
- [ ] Healthcare/Hospitals
- [ ] Hospitality Industry/Tourism
- [ ] Information Technology
- [ ] Insurance
- [ ] Investment Management
- [ ] Legal Services
- [ ] Life, Physical, And Social Science
- [ ] Management
- [ ] Management Consulting
- [ ] Media
- [ ] Public Health
- [ ] Other

What type of organization do you currently work for?

- ☐ Academia/Research Institute
- ☐ Government
- ☐ International Organization
- ☐ NGO
- ☐ Private Sector
- ☐ Other

What are your primary fields? (hold Alt [pc] or command [mac] to select multiple)

American Politics
Applied Econometrics
Applied Sociology
Behavioral Economics
Behavioral Insights
Behavioral Science
Cognitive Psychology
Collective Behavior
Comparative Politics
Comparative Sociology

What are your primary fields? (hold Alt [pc] or command [mac] to select multiple)

- Applied Econometrics
- Behavioral Economics
- Development Economics
- Econometrics
- Economic History
- Economics Of Education
- Environment, Resource And Energy Economics
- Experimental Economics
- Financial Economics
- Game Theory

What are your primary fields? (hold Alt [pc] or command [mac] to select multiple)

- Behavioral Insights
- Behavioral Science
- Cognitive Psychology
- Developmental Psychology
- Experimental Psychology
- Neuropsychology
- Neuroscience
- Other Psychology
- Positive Psychology
- Social Psychology

What are your primary fields? (hold Alt [pc] or command [mac] to select multiple)

- American Politics
- Comparative Politics
- European Politics
- Formal Theory
- International Relations
- Other Political Science
- Political Behavior
- Political Economy
- Political Psychology
- Political Theory

What are your primary fields? (hold Alt [pc] or command [mac] to select multiple)

- Applied Sociology
- Collective Behavior
- Comparative Sociology
- Computational Social Science
- Crime And Delinquency
- Cultural Sociology
- Demography
- Deviant Behavior
- Empirical Research Methodology
- Human Ecology

What is your primary research institution?

Which of the following best describes your education level?

- ○ No formal education
- ○ Primary education
- ○ Secondary education or high school
- ○ GED
- ○ Some college
- ○ Vocational qualification
- ○ Associate's degree
- ○ Bachelor's degree
- ○ Master's degree
- ○ Professional degree (JD/MD/MBA)
- ○ Doctorate or higher

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Curriculum Vitae — September 2026

CURRENT POSITION

McKenzie Research Fellow, Melbourne Institute, The University of Melbourne (June 2025–present)

Competitive full-time research fellowship (2.5% selection rate). On external leave from the World Bank.

Founder and Director, Policy Preferences Lab (www.policypreferenceslab.org).

EDUCATION

PhD in Economics, Australian National University (2016–2020)

Thesis: field and survey experiments on taxes and government transfers in developing countries.

Nominated by two examiners for the university's most outstanding PhD thesis award.

MA in International and Development Economics, Yale University (2011–2012)

Graduate coursework in economics, econometrics, international development, and public policy; highest possible grade in all subjects. Completed while on study leave from the Australian Treasury.

Visiting Scholar, Global Poverty Research Lab, Northwestern University (2019)

Hosted by Prof. Dean Karlan during PhD studies.

Bachelor of Commerce (Advanced), First Class Honours, University of Sydney (2006–2010)

Honours thesis on taxation in Africa; awarded most outstanding all-round student in the Economics and Business faculty; exchange semester at UCLA (4.0 GPA).

RESEARCH AFFILIATIONS

Abdul Latif Jameel Poverty Action Lab (J-PAL); Institute for Fiscal Studies (TaxDev); World Bank Tax Data Lab (DATAX; co-led 2024–25); Tax and Transfer Policy Institute, ANU.

PREVIOUS POSITIONS

Economist, World Bank — Young Professionals Program; Poverty, Macroeconomics, and Governance Global Practices (2020–2025). Analytical and lending operations across Sub-Saharan Africa, Asia, and the Pacific; 10+ client-government trainings (Kenya, Tanzania, Indonesia, Thailand, Zambia, PNG, Kiribati, Timor-Leste).

Research Fellow, Australian National University (2020).

Independent Economics Consultant (2016–2020).

Lecturer (part-time), Crawford School of Public Policy, ANU (2019).

Lecturer (part-time), University of Sydney (2017–2018).

Researcher, Overseas Development Institute — Growth, Poverty and Inequality (2014–2015).

Country Economist (part-time), UNICEF Uganda; Researcher (part-time), IPA Uganda (2014).

Economist, Australian Aid Program — AusAID/DFAT (2012–2014).

Graduate Economist, Australian Treasury — Foreign Investment and Trade Policy (2011–2012).

PEER-REVIEWED PUBLICATIONS

1. Hoy, C., Kim, Y.S., Nguyen, M.C., Sosa, M., & Tiwari, S. (2026). "Attitudes towards reducing fossil fuel subsidies: Evidence across 12 middle-income countries." Journal of Development Economics, 178, 103612.
2. Hoy, C. (2025). "How does progressivity impact tax morale? Experimental evidence across developing countries." Journal of Development Economics, 172, 103398.
3. Kanagavel, R., Hoy, C., & Cameron, C. (2025). "Intra-household dynamics and attitudes towards vaccines: Experimental and survey evidence from Zambia." Review of Economics of the Household.

4. McKenzie, L., Hoy, C., & Sinning, M. (2024). “Improving tax compliance without increasing revenue: Evidence from population-wide randomized controlled trials in Papua New Guinea.” Economic Development and Cultural Change, 72(2), 691–723.
5. Toth, R., Hoy, C., & Merdikawati, N. (2024). “A false divide? Providing information about inequality aligns preferences for redistribution between right- and left-wing voters.” Journal of Economic Inequality, 22(3), 669–707.
6. Toth, R., Hoy, C., & Merdikawati, N. (2024). “How does information about inequality shape voting intentions and preferences for redistribution? Evidence from a randomized survey experiment in Indonesia.” Journal of Behavioral and Experimental Economics, 112, 102274.
7. Simbeye, L., Koivisto, A., Hoy, C., Maboshe, M., & Malik, M.A.A. (2024). “How have formal firms recovered from the pandemic? Insights from survey and tax administrative data in Zambia.” Journal of African Economies, 33(5), 538–561.
8. Hoy, C., Toth, R., & Merdikawati, N. (2022). “Can a multipronged strategy of ‘soft’ interventions surmount structural barriers for financial inclusion? Evidence from the unbanked in Papua New Guinea.” Journal of Development Studies, 58(12), 2460–2482.
9. Mijs, J.J.B., & Hoy, C. (2022). “How information about economic inequality impacts belief in meritocracy: Evidence from a randomized survey experiment across Australia, Indonesia and Mexico.” Social Problems, 69(1), 91–122.
10. Wood, T., & Hoy, C. (2022). “Helping us or helping them? What makes foreign aid popular with donor publics?” Economic Development and Cultural Change, 70(2), 567–586 (most downloaded article, 2022).
11. Wood, T., Moscoe, E., & Hoy, C. (2022). “Addressing vaccine hesitancy in developing countries: Survey and experimental evidence.” PLOS ONE, 17(11), e0277493.
12. Sumner, A., Hoy, C., & Ortiz-Juarez, E. (2022). “Measuring global poverty before and during the pandemic: A political economy of overoptimism.” Third World Quarterly, 43(1), 1–17.
13. Hoy, C., & Mager, F. (2021). “Why are relatively poor people not more supportive of redistribution? Evidence from a randomized survey experiment across ten countries.” American Economic Journal: Economic Policy, 13(4), 299–328.
14. Hoy, C., & Mager, F. (2021). “American exceptionalism? Differences in the elasticity of preferences for redistribution between the United States and Western Europe.” Journal of Economic Behavior and Organization, 192, 518–540.
15. Wood, T., & Hoy, C. (2021). “The effect of geostrategic competition on public attitudes to aid.” Journal of Experimental Political Science, 8(3), 285–295.
16. Sumner, A., & Hoy, C. (2021). “The end of global poverty: Is the UN Sustainable Development Goal 1 (still) achievable?” Global Policy, 12(4), 419–429.

PAPERS UNDER REVIEW

Jolevski, F., Hoy, C., & Obeyesekere, A. “Revealing tax evasion: Experimental evidence from a nationally representative survey of Indonesian firms.” Conditionally accepted, Journal of Economic Behavior and Organization.

Gerard, F., Hoy, C., Waltmann, B., & Bond, E. “Attitudes toward poverty reduction programs around the world.” Revise & resubmit, Journal of Development Economics.

Page, L., Hoy, C., Eckel, C., Grossman, P., & Goldstein, D. “Political polarization, wage inequality and preferences for redistribution.” Revise & resubmit, Journal of Economic Behavior and Organization.

WORKING PAPERS

Hoy, C., Strehl-Pessina, M., Doino, R., Naidoo, D., Mambon, K., & Kunda, B. “Who Benefits from Food Tax Exemptions in Lower-Income Settings? Evidence on Pass-Through and Incidence.” [Paper submitted with this application]

Bachas, P., Jensen, A., Hoy, C., & Shaukat, M. “Horizontal equity of taxation: Citizen beliefs and policy preferences.” World Bank Policy Research Working Paper 11367.

Decerf, B., Hoy, C., & Sterck, O. “For shorter or poorer: Attitudes toward the trade-off between poverty and mortality.” Institute for Fiscal Studies.

Lee, Y.S., Hoy, C., Merritt, C., & Dominski, J. “Managers as gatekeepers in the age of AI.” Institute for Fiscal Studies.

Hoy, C., et al. “Public preferences for economic reforms.” World Bank (2026 World Bank ECA Research with Impact Award).

Hoy, C., et al. “Trade-offs in the design of simplified tax regimes.” World Bank; under review, World Development.

SELECTED POLICY REPORTS

World Bank (2026). Raising Revenue Right: A Roadmap for Domestic Resource Mobilization (contributor).

World Bank (2026). Indonesia: Unlocking Businesses’ Tax Potential for Growth.

World Bank (2026). Hooked on Subsidies: The Case for Reform.

World Bank (2025). Beyond the Budget: Fiscal Policy for Growth and Jobs — A Public Finance Review for Kenya.

World Bank (2025). Zambia Poverty & Equity Assessment: Turning Things Around After a Lost Decade.

ICTD (2025). Simplified Taxation in Africa: What We Know — and Need to Know.

World Bank (2024). Leveling the Playing Field: Structural Inequalities and Poverty in Africa.

RESEARCH GRANTS (> US$2.7 MILLION TOTAL)

World Bank Global Tax Program (US$1,250,000); ADB Impact Evaluation Committee (US$600,000); Gates Foundation (US$200,000); Oxfam (US$125,000); GIZ (US$100,000); World Bank ESMAP (US$80,000); Australian Aid Program/DFAT (US$55,000); UK Aid/FCDO (US$45,000); University of Sydney Research Excellence Initiative (US$26,000); J-PAL (US$12,000).

AWARDS AND HONOURS

Sir Tony Atkinson Prize, Society for the Study of Economic Inequality — ECINEQ (2025).

World Bank ECA Research with Impact Award (2026), for the Preferences for Economic Reforms study.

World Bank East Asia and Pacific Vice President’s Above and Beyond Award (2024).

World Bank Prosperity Vice President’s Team Award (2022).

Most downloaded article, Economic Development and Cultural Change (2022).

Australian Government Postgraduate Award (2016).

Most outstanding all-round student, Economics and Business faculty, University of Sydney (2010).

INVITED PRESENTATIONS (SELECTED)

University seminars: Harvard (2026), UNSW (2026), Monash (2026), LSE (2018, 2025), Paris School of Economics (2019, 2025), Macquarie (2025), QUT (2019, 2025), Oxford (2019, 2021), University of Wisconsin–Madison (2020), MIT (2019), KDI (2019), University of the South Pacific (2021).

Conferences: IIPF (2026, Lisbon), Australasian Development Economics Workshop (2016–2026, seven editions), ECINEQ (2019, 2025), NEUDC (2019, 2024), PacDev (2022), MWIEDC (2020), OECD (2020), IZA (2017).

Policy institutions: World Bank Research Department (2022–2024), World Bank (2026), Asian Development Bank (2018–2026), DFAT, and the Australian Taxation Office.

REFEREE SERVICE

Quarterly Journal of Economics; Journal of the European Economic Association; Review of Economics and Statistics; AEJ: Economic Policy; Journal of Public Economics; Journal of Development Economics; Journal of Economic Behavior and Organization.

Statement of Motivation and Research Interests

Christopher Hoy — NBER Workshop on Development Economics and Networks for Early-Career Researchers

I am a development economist studying public finance in lower-income countries. I am a McKenzie Research Fellow at the Melbourne Institute, University of Melbourne, on external leave from the World Bank. I completed my PhD in economics at the Australian National University in 2020 and hold a Master of Arts in International and Development Economics from Yale University. My research asks two connected questions: how do fiscal policies in developing countries actually perform once informality, market structure, and administrative capacity are taken into account; and what do citizens believe about—and want from—those policies?

The paper I would present, "Who Benefits from Food Tax Exemptions in Lower-Income Settings?", shows how the structure of local retail markets determines who benefits from one of the developing world's most common tax policies. Using the unanticipated removal of VAT on ten basic food items in Papua New Guinea, we combine administrative data, a monthly census of supermarket prices, web-scraped online prices, and a nationally representative household phone panel in a difference-in-differences design. Pass-through is complete only in dense urban retail clusters—where each supermarket is on average 150 meters from its nearest competitor—and zero in the informal and rural markets where poorer households mainly shop; only 16 percent of the foregone revenue reaches the poorest 40 percent of households. A decomposition shows that consumption patterns account for about two-thirds of the concentration of benefits among richer households and heterogeneous pass-through for the remaining third. These results were unanticipated by the 237 experts in our prediction survey, one of the largest to date. The economics of the paper is, at its core, about networks: the spatial network of competing retailers, and households' links to formal and informal sellers, jointly determine how a national tax change propagates to prices and welfare.

My motivation for attending is threefold. First, methods: I want to bring frontier network measurement and econometrics into fiscal-policy experiments—most immediately to study peer effects and information diffusion in tax compliance, building on population-wide RCTs I have run with Papua New Guinea's tax authority, and to understand how beliefs about policy spread through social networks, which sits at the core of my preference-formation agenda. Second, feedback: the workshop's mix of frontier lectures and work-in-progress sessions comes at exactly the right time, as we finalize this paper for journal submission. Third, community: based in Australia, and having spent five years inside a policy institution, I am deliberate about building lasting ties to the NBER development and networks community at this stage of my academic career.