

**GRAB**  
NasdaqListed



# The Impact of Grab Services on The Thai Economy

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## Glossary

**Value added** is defined broadly as the increase in value of a product resulting from processes that change its current place, time, and characteristics to characteristics preferred in the marketplace. To put it more simply, value added measures what a business contributes to its outputs over and above the cost of its inputs.

**Backward linkage**, in general, refers to the demand an industry creates for inputs from its suppliers, influencing production in upstream industries. In this study, it focuses on how Grab's business services induce demand for materials and services from other industries.

**Forward linkage**, in general, refers to the effect an industry's output has on downstream industries that use this output as an input for their own production. In this study, it focuses on how Grab's business services support and enable the development of downstream industries that use Grab's services as a foundation or input for their own products or services.

**Direct impact** represents the value added that Grab itself directly creates for the Thai economy. This value added includes the use of factors of production (land, capital, labor, entrepreneurship) and taxes incurred.

**Indirect impact** captures the extent to which Grab's operations create additional demand for intermediate industrial inputs.

**Induced impact** captures the extent to which Grab's operations create additional household demand induced by increased household income that Grab directly and indirectly generates for the Thai economy.

**Driver-partners** access work through the Grab app, delivering food, grocery and parcels, or providing mobility services to the local resident population.

**Household income** represents the total income (wages and salaries from employment, including pension and social security contributions from employees, and before deduction of personal income taxes) that Grab directly and indirectly generates for the Thai economy. This includes income received by Grab's employees for their work with the company, as well as household labor income generated indirectly through Grab's additional demand for intermediate industrial inputs. It also includes income for driver-partners who access work through the Grab app, delivering food, groceries, and parcels or providing mobility services to the local population.

**Full-time equivalent (FTE)** is a unit of measurement that indicates the workload of an employed person, making workloads comparable across various contexts. In this paper, an FTE of 1.0 represents the average earnings of a full-time worker, while an FTE of 0.5 indicates half of that earning. FTE helps identify the number of part-time and full-time employees that make up the total workforce in terms of full-time employees.

**Earning opportunities** include the FTE jobs supported across the operations of Grab and its merchant-partners, the combined supply chains of Grab and its merchant- and driver-partners, as well as the average number of driver-partners who earned an income via the Grab platform at least once a month. Do note, earning opportunities for driver-partners should not be construed as describing a contractual form of employment between Grab and its partners, nor does it imply that Grab partners are considered employees of Grab under prevailing labor laws.

# The Impact of Grab Services on The Thai Economy

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## Executive Summary

This study assesses the economic impact of Grab's diverse service offerings, a pioneering digital platform that integrates transportation, delivery, and financial services within a single superapp. Grab's services drive both direct and indirect economic contributions, supporting businesses and individuals across Thailand. Key findings from 2023 indicate that Grab contributed approximately 179.2 billion baht (1.0% of Thailand's nominal GDP) and generated 280,000 earning opportunities, adding around 24.2 billion baht to household incomes, which is about 0.5% of Thailand's total household wage and salary income. These earning opportunities provided by Grab contribute to enhancing the quality of life for the people of Thailand.

### Key Contributions:

1. **Overall Economic Impact:** The estimated multiplier effect of Grab on the Thai economy is 2.68. This means that for every 1 baht of GDP generated by activities on the Grab platform, an additional 2.68 baht of GDP is supported in other sectors of the Thai economy. In total, Grab contributed 179.2 billion baht to Thailand's economy in 2023, accounting for 1.0% of nominal Gross Domestic Product (GDP).
2. **Employment and Income Generation:** Through its extensive ecosystem, Grab supported around 280,000 earning opportunities. These entail those directly employed by Grab, its merchant-partners, within the combined supply chains of Grab and its driver- and merchant-partners, as well as driver-partners earning an income via the Grab platform. This increased household income by approximately 24.2 billion baht.
3. **Sectoral Linkages:** Major sectors benefiting from Grab's direct operations include business services such as telecommunications, banking, and financial services. Driver-partner activities further boost demand in sectors like motor vehicles and repair, petroleum, and gas, while merchant-partners on the Grab platform stimulate supply chains in processed foods (e.g., seafood, vegetables, and soft drinks), as well as the wholesale and retail sectors.

The study emphasizes the role of digital platforms like Grab in modern economic development, suggesting that supporting such digital ecosystems can yield substantial economic benefits. Policymakers are encouraged to foster this growth through supportive regulations and infrastructure investments to leverage the full potential of digital transformation in Thailand.

# The Impact of Grab Services on The Thai Economy

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## 1. Background and Objectives

Digital technologies have brought about a revolution in contemporary society by improving efficiency, innovation, connectivity, and quality of life. Businesses can now operate more efficiently, enhance customer experiences, and develop new business models that were previously unattainable.

Grab is an example of this new model, offering a variety of services combined within one platform (superapp). Currently, Grab provides delivery services (food, groceries, parcel delivery), on-demand transportation services, and financial services (payment, lending and insurance) to the Thai economy. The services that Grab provides create both direct economic impact for its customers and stakeholders in the ecosystem and indirect economic value through its close economic linkages to different industries.

Despite the fact that Grab is one of the leading firms providing today's customer needs with innovations such as on-demand transportation and food delivery, there has been no research providing an in-depth analysis of its contribution to the Thai economy, especially in the transportation and food sectors.

This research aims to fill this gap by assessing and measuring the impacts of Grab's services on the Thai economy in terms of its generated economic value, employment impact, and other indirect economic value creation.

The findings will provide valuable insights about Grab's contribution to the Thai economy.

## 2. Grab's Service Offerings

In the era of digital transformation, smartphones have become an integral part of modern life. A superapp or an everything-app is an application that combines various services into one platform, such as ride-hailing, food delivery, and shopping, to meet the needs of everyday life.

Grab is a leading superapp in Southeast Asia that enables high-frequency hyperlocal consumer services (Grab, 2022). Generally, its core business is to provide access to everyday services, including transport, deliveries, e-payment, and financial services.

In Thailand, Grab's main businesses are mobility, delivery, and financial services. The mobility and delivery services are provided on-demand via the Grab app. Ride-hailing is its main transport offering that includes GrabTaxi, GrabCar, and GrabBike. GrabTaxi and GrabCar provide car rides of choice, similar to traditional taxi services, but booked through the Grab app. GrabBike offers motorbike rides and is particularly popular in densely populated urban areas where traffic congestion is common.

Delivery services include GrabFood, which allows users to order food from a wide range of restaurants and have it delivered to their doorstep; GrabMart, which enables users to purchase groceries, household items, and other daily essentials from nearby stores and supermarkets; and GrabExpress, which offers on-demand courier delivery for packages, documents, and other items.

Grab's financial services offerings are primarily targeted at its driver- and merchant-partners. After partnering Grab for a certain amount of time, partners become eligible to borrow funds. These funds are often used to purchase service-related assets such as cars, bikes, mobile phones, computers, and tablets. Merchant-partners can also access loans to fund investments aimed at improving operations or expanding their businesses.

### **3. Theoretical Framework for Analysis**

How might we measure the impact of Grab's services on the Thai economy? Grab, like other businesses, provides economic value to the economy in terms of 'value added'. A broad definition of value added is to add value to a product by changing its current place, time, and form characteristics to characteristics more preferred in the marketplace (Coltrain et al., 2000). To put it more simply, value added measures what a business contributes to its outputs over and above the cost of its inputs. It is represented by the difference between the value of goods and services produced and the cost of goods and services purchased from other businesses.

To understand how Grab creates value added, we can examine the key resources it uses through the lens of the four factors of production, which are part of standard economic analysis: 1) Land refers to the physical land where a company operates; 2) Labor refers to any work performed by people contributing to the service; 3) Capital refers to manufactured and financial resources such as computers and delivery vehicles used to run the business; and 4) Entrepreneurship refers to the creation of new goods and services by combining other factors of production. Each factor of production has its own reward from being a part of the operation. Additionally, taxes collected on returns to factors of production and profit also contribute towards value added and help support the overall development and functioning of the country.

In addition, another contribution is based on Hirschman (1958), who proposed that there is a mutual relationship between forward and backward linkages in an expanding industry. The product or service of a newly emerging business induces demand for materials and services (backward linkage) and enables the emergence of supply industries to which they sell their product or service (forward linkage).

Finally, modern analysis of economic contribution does not only recognize the interconnectedness between production operations but also the interconnection of all transactions between different production operations, factors of production, and institutions (households, government) within the economy and with respect to the rest of the world (Sussangkarn and Tinakorn, 1999). A social accounting matrix (SAM) is commonly used as a comprehensive accounting framework to capture all the circular flow of operations induced by new businesses (see Appendix A).

The theoretical framework for the analysis is summarized in Figure 1. The impact of Grab's services on the Thai economy can be divided into three broad types of impact:

- 1) **Direct impact** represents the value added that Grab creates for the Thai economy. It consists of the contribution in the form of purchasing factors of production, and includes taxes incurred.
- 2) **Indirect impact** captures the extent to which Grab's operations create additional demand for intermediate industrial inputs.
- 3) **Induced impact** captures the extent to which Grab's operations create additional household demand induced by increased household income<sup>1</sup> that Grab directly and indirectly generates for the Thai economy.

The total impact is then equal to the sum of these three impacts.

## **4. Data and Methodology**

### **4.1 Data**

The analysis employs three sets of databases to estimate the impact of Grab services on the Thai economy. Firstly, Grab's financial database, obtained directly from Grab, covers operational data, including revenues from two core businesses - Mobility (i.e. GrabTaxi, GrabCar, GrabBike) and Deliveries (i.e. GrabFood, GrabMart, GrabExpress), operational expenditures, labor data, as well as revenue earned by merchants and drivers as part of their partnership in providing services with Grab<sup>2</sup>.

Secondly, the input-output table represents the interconnectedness between industries, where one industry typically demands goods and services from other industries as intermediate inputs to provide final goods and services. This data is obtained from the Office of the National Economic and Social Development Council (NESDC).

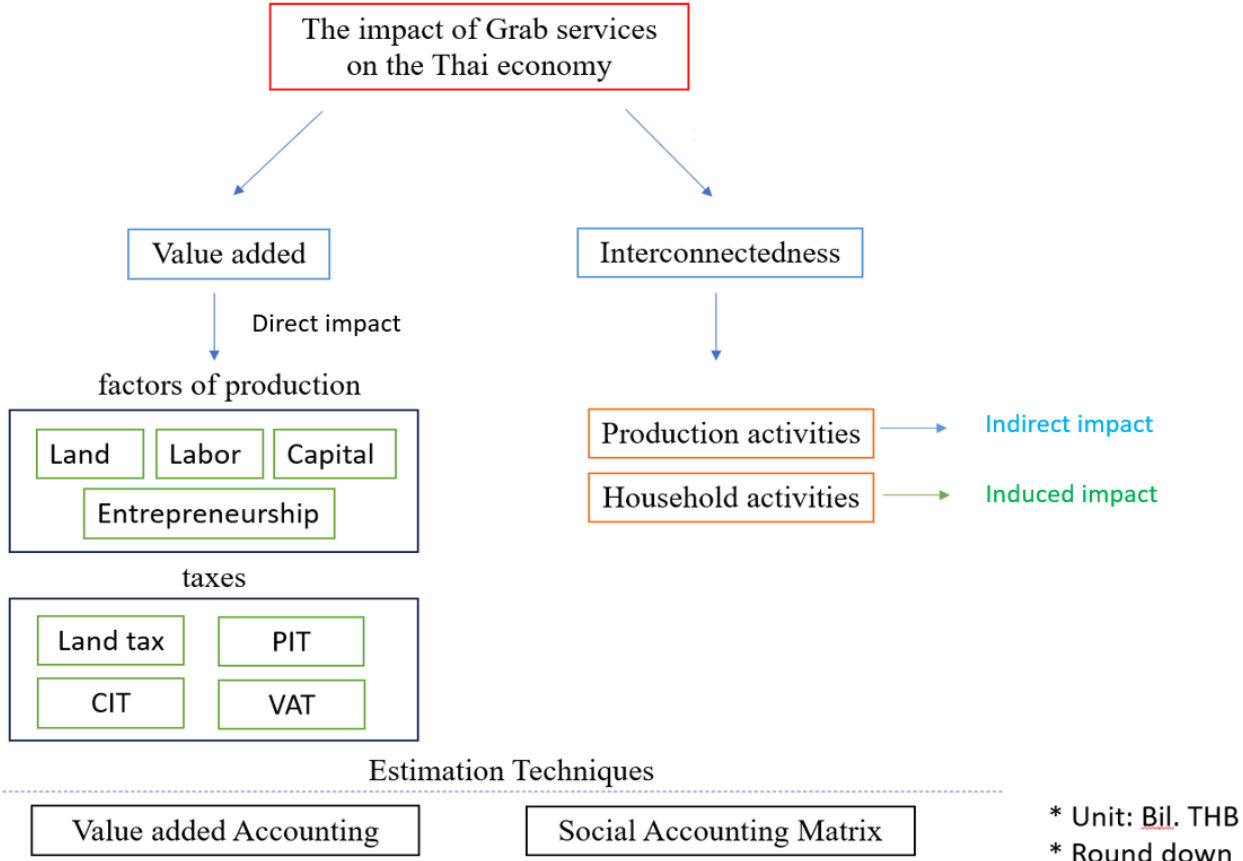
Finally, the Household Socio-Economic Survey (SES) provides insights into Thai households' incomes and detailed spending, which helps understand the linkages between industry production and household spending. This data is obtained from the Thai National Statistical Office.

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<sup>1</sup> Please refer to the glossary for the definition of household income.

<sup>2</sup> Grab's operations across its financial services, enterprises and new initiatives segments are not included in this study.

**Figure 1: Theoretical Framework for the Analysis**



Source: Author's illustration

**4.2 Methodology**

The methodology for this study involves four steps as illustrated in Figure 1:

1. **Data preparation:** All data are collected from relevant agencies. This study provides a snapshot of the impact in 2023. The latest available input-output database, dated 2015, is updated using the RAS method (Polenske, 1997), which is a standard procedure for updating the input-output table.
2. **Value-added accounting:** Grab's accounting data is recategorized to match economic concepts of value added, involving sorting accounting items as expenditures on four key factors of production. This sorting is straightforward, as financial accounting items are normally categorized in a way suitable to fit each concept. Adding all of these value-added components gives an estimate of the direct impact of Grab on the Thai economy.
3. **Social Accounting Matrix creation:** The input-output table and the SES data are used to obtain the Social Accounting Matrix for Thailand. This study follows Sussangkarn and Tinakorn's approach. However, to simplify the analysis, the matrix contains only two main sectors: the production sector, where intermediate inputs are exchanged, and the household sector, where households receive income from the production sector and



purchase products from it. That is, this study extends the standard input-output analysis by adding a household sector and creating a two-sector social accounting matrix for the analysis.

4. **Indirect impact and Induced impact calculation:** The two-sector Social Accounting Matrix is used to calculate the indirect and induced impacts using the Leontief Input-Output Model (Gallifent, 2023). The mathematical derivation of this approach can be found in Appendix B.

The unit of analysis for this paper is in billions of Thai Baht. An exchange rate of 35 Thai Baht to 1 US Dollar is used, and all the numbers in the analysis are rounded down to provide a conservative estimate of the impact.

### 4.3 Outcome Metrics

To make the findings accessible for non-technical audiences, this paper presents the outcomes in the following ways (see Appendix C for mathematical formulas):

1. **GDP Impact:** This shows the total contribution of Grab's operations to the GDP.
2. **Household Income:** This represents the total income that Grab directly and indirectly generates for the Thai economy. This includes income received by Grab's employees for their work with the company, as well as household labor income generated through Grab's additional demand for intermediate industrial inputs. It also includes income for driver-partners who access work through the Grab app, delivering food, groceries, and parcels or providing mobility services to the local population.
3. **Earning opportunities** include the FTE jobs supported across the operations of Grab and its merchant-partners, the combined supply chains of Grab and its merchant- and driver-partners, as well as the average number of driver-partners who earned an income via the Grab platform at least once a month.

## 5. Findings

### 5.1 Overall Economic Contribution

This paper finds that the estimated multiplier effect of Grab on the Thai economy is 2.68. In other words, for every 1 baht of GDP generated by activities on the Grab platform, an additional 2.68 baht of GDP is supported in other parts of the Thai economy.

The overall economic contribution of Grab services to the Thai economy is valued at 179.2 billion baht, representing 1.0% of Thailand's nominal Gross Domestic Product (GDP) in 2023<sup>3</sup>. This contribution includes a direct impact of 48.6 billion baht (27.1% of the total), an indirect impact of 80.6 billion baht (45.0% of the total), and an induced impact of 49.9 billion baht (27.9% of the total) (Figure 2).

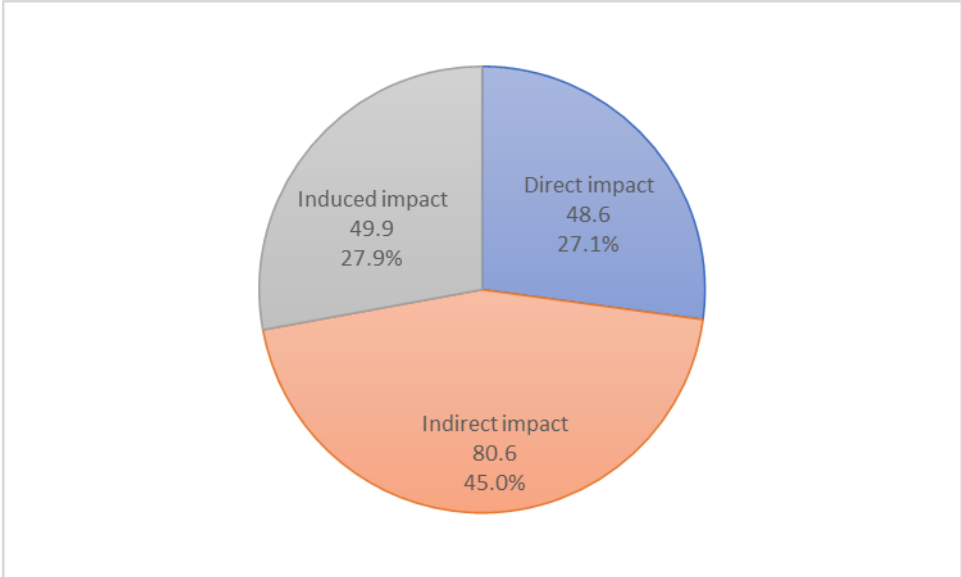
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<sup>3</sup> This figure represents the value calculated before tax.

The overall contribution can also be broken down into contributions from Grab’s operations at 15.9 billion baht (8.9% of the total), driver-partners at 68.3 billion baht (38.1% of the total), and merchant-partners at 94.9 billion baht (53.0% of the total) (Figure 3).

Grab’s business helped create nearly 280,000 earning opportunities in Thailand in 2023, either through direct employment with Grab, its merchant partners or within their combined supply chains, as well as gig workers earning an income via the Grab platform. This contributed approximately 24.2 billion baht to household income in 2023, representing 0.5% of Thailand’s total household wage and salary income<sup>4</sup>.

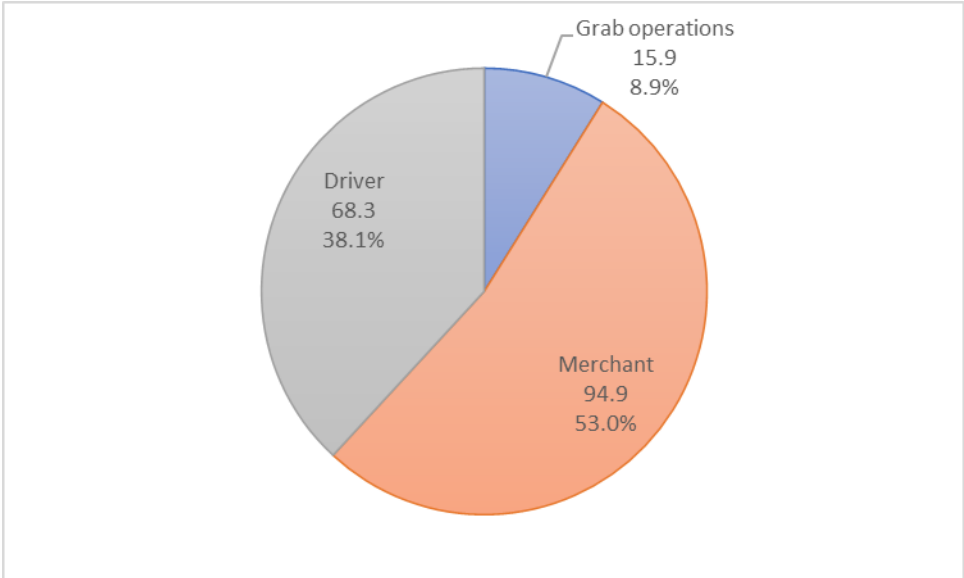
**Figure 2: GDP Contributions by Broad Types of Impact (Unit: Billions of baht)**



Source: TDRI’s calculation.

<sup>4</sup> In this paper, the definition of national household wage and salary income is the total wage and salary income earned by all households in a year.

**Figure 3: GDP Contributions by Stakeholder (Unit: Billions of baht)**



Source: TDRI’s calculation.

**5.2 Contributions by Stakeholder**

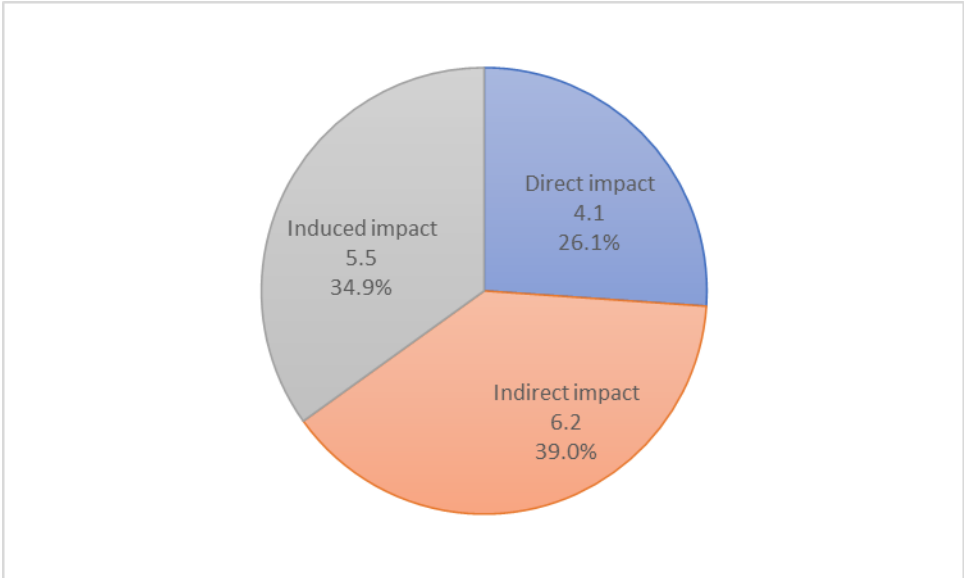
**Grab’s operations**

Grab’s operations made a total economic contribution of 15.9 billion baht to Thailand's GDP in 2023, equivalent to around 0.08% of Thailand’s nominal GDP. This accounted for 8.9% of Grab’s overall economic contribution (Figure 3).

Of this total, 26.1% was driven by a direct contribution of 4.1 billion baht to GDP (Figure 4), stemming from the profits and wages generated by Grab's operations in Thailand. Meanwhile, 39.0% came from an indirect impact of 6.2 billion baht, and the remaining 34.9% resulted from an induced impact of 5.5 billion baht.

Grab’s operations involve the use of intermediate inputs, such as business services and office equipment. Grab generates profits for local businesses and supports job creation in key sectors that supply these inputs, including telecommunications, financial services, banking services, printing and publishing, and the electricity sector.

**Figure 4: GDP Contribution by Grab’s operations (Unit: Billions of baht)**



Source: TDRI’s calculation.

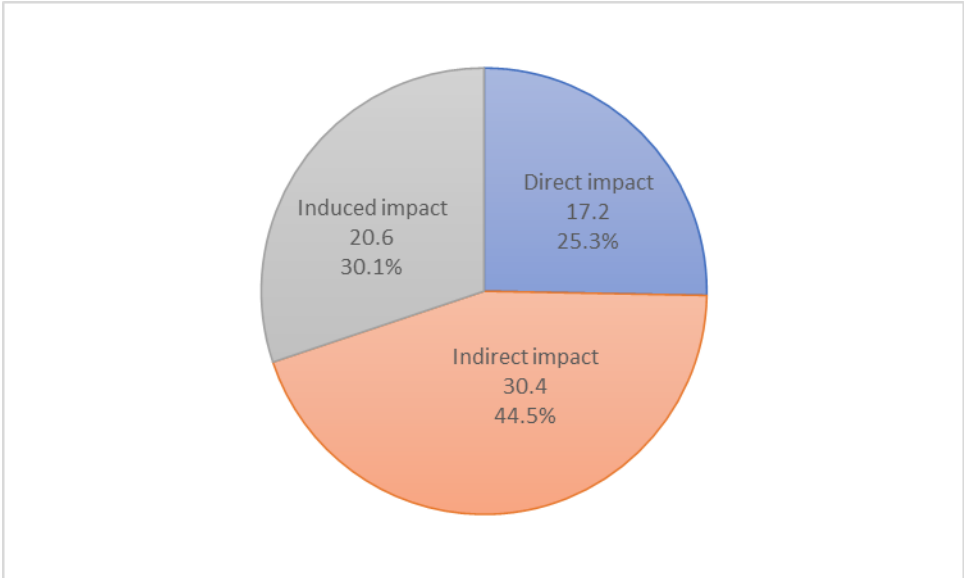
**Driver-partners**

Grab’s driver-partners contributed approximately 68.3 billion baht, equivalent to 0.38% of Thailand’s GDP in 2023. This total economic impact includes a direct contribution to Thailand’s GDP of 17.2 billion baht, constituting 25.3% of the driver-partners’ total economic impact, an indirect impact of 30.4 billion baht (44.5% of the total), and an induced impact of 20.6 billion baht (30.1% of the total). (Figure 5)<sup>5</sup>.

These contributions are distributed across various economic sectors, with the majority of spending in industries that support operations, including motor vehicles and motor vehicle repair, petroleum, gas and electricity, telecommunications, banking services, and other business services.

<sup>5</sup> The GDP impact of driver-partners includes their earnings as well as the spending supported in the wider economy through their purchase of goods and services to maintain their vehicles such as fuel and maintenance (i.e., indirect impact) and purchases in the consumer economy (i.e. induced impact). Meanwhile, the earnings opportunities refer to the number of unique driver-partners and does not include the jobs supported via the indirect and induced impacts. These impacts should not be construed as describing a contractual form of employment between Grab and its partners, nor does it imply that Grab partners are considered employees of Grab under prevailing labor laws.

**Figure 5: GDP Contribution by Driver-partners (Unit: Billions of baht)**



Source: TDRI’s calculation.

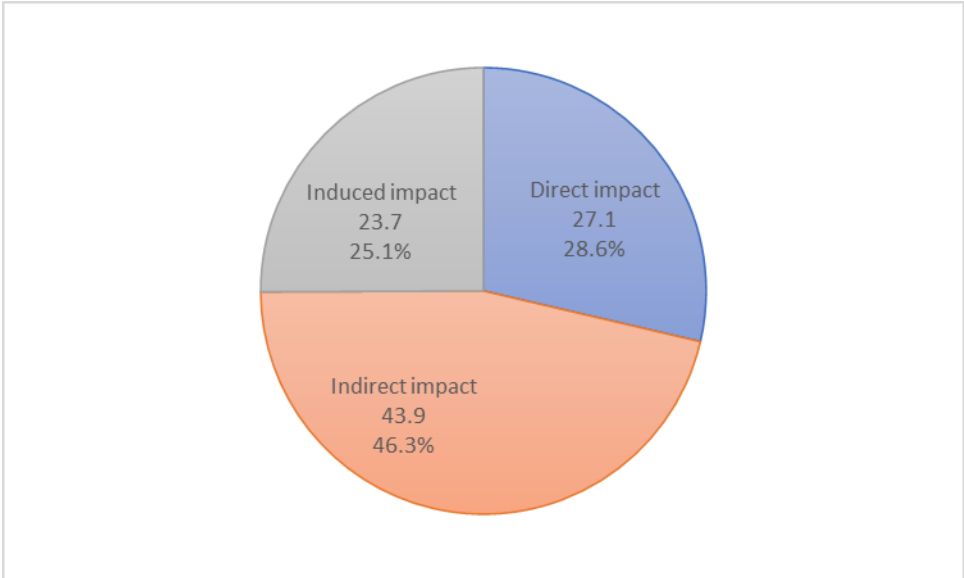
**Merchant-partners**

Grab’s merchant-partners contributed an estimated 94.9 billion baht, equivalent to 0.53% of Thailand’s GDP in 2023, primarily derived from sales made through GrabFood and GrabMart on the Grab app. This accounts for more than half of Grab’s overall economic contribution, as the indirect demand generated by Grab typically involves a higher share of spending on intermediate inputs than on labor.

This total economic impact includes a direct contribution to Thailand’s GDP worth 27.1 billion baht, accounting for 28.6% of the merchant-partners’ total economic impact, an indirect impact of 43.9 billion baht (46.3% of the total), and an induced impact of 23.7 billion baht (25.1% of the total). (Figure 6)

The stimulated economic impacts were concentrated among their supply chain partners, which include a wide range of processed food sectors, such as fish and seafood, vegetables, fruits, meat processing, soft drinks, as well as wholesale and retail partners.

**Figure 6: GDP Contribution by Merchant-partners (Unit: Billions of baht)**



Source: TDRI’s calculation.

**6. Conclusion**

This study provides a comprehensive analysis of the impact of Grab's services on the Thai economy, highlighting both its direct, indirect and induced contributions. The findings reveal that Grab significantly enhances economic value, stimulates demand across various industries, and generates substantial earning opportunities.

Major sectors benefiting from Grab’s direct operations include business services such as telecommunications, banking and financial services, while driver-partners further increase demand in sectors like motor vehicles and repair, petroleum, and gas. Additionally, merchant partners’ activities on the Grab platform stimulate supply chain sectors, such as processed foods (e.g., seafood, vegetables, and soft drinks), as well as wholesale and retail.

Key findings include:

1. The estimated multiplier effect of Grab on the Thai economy is 2.68, implying that every 1 baht generated by Grab activities will boost the entire economy by 2.68 baht.
2. Grab’s on-demand services contributed 179.2 billion baht to the economy in 2023, accounting for 1.0% of Thailand’s total GDP.
3. It supported approximately 280,000 earning opportunities in Thailand, and added around 24.2 billion baht to household income in 2023, which is about 0.5% of Thailand’s total household wage and salary income.
4. Grab’s operations made a total economic contribution of 15.9 billion baht to Thailand's GDP in 2023.

5. Grab's driver-partners contributed approximately 68.3 billion baht to Thailand's GDP in 2023, while Grab's merchant-partners added an estimated 94.9 billion baht.

The flexibility of Grab's driver- and merchant-partners to operate on multiple platforms suggests that these economic impact figures—reflecting only transactions made through the Grab app—represent just a fraction of their total contribution. This highlights the pivotal role digital platforms like Grab play in modern economic development.

Furthermore, this study does not include Grab's financial services, which have the potential to unlock investment opportunities and drive emerging economic growth, particularly in entrepreneurship and small businesses. These are areas where existing Thai financial institutions and infrastructure may not fully meet the demand.

By fostering new business models and enhancing connectivity, Grab not only improves efficiency and quality of life but also strengthens economic linkages across various sectors, leveraging its economies of scale across different business verticals. For example, by providing drivers with income-earning opportunities and leveraging their earnings data, Grab can offer fractional loans using proprietary credit scoring models. These loans are based on drivers' earning patterns and potential on the platform. Many of these drivers would not have access to credit from traditional lenders (e.g., banks) because they may not meet the required credit rating due to being self-employed or lacking fixed salaries. With loans from Grab, they are able to improve their lives, such as paying for courses to upskill, purchasing equipment like better mobile phones or laptops to increase productivity, or handling emergencies for themselves or their families.

This research fills a critical gap by quantifying Grab's economic impact, offering valuable insights for policymakers and stakeholders. In conclusion, supporting the growth and integration of digital services like those offered by Grab can yield significant economic benefits.

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## Appendix A: Social Accounting Matrix (SAM)

The Social Accounting Matrix is a table that shows the circulation of production, income, and expenditure in the economy across various important economic sectors, providing more comprehensive data than that shown by the National Income Account and Input-Output Table. It is often used to analyze the impact of changes in economic policies or new economic operations (such as Grab's business operations) on household income and expenditure behavior, as well as the production behavior of business sectors.

The Social Accounting Matrix consists of four main accounts: Household Accounts, Business Accounts, Government Accounts, and External Accounts. The data in the table reflects the income and expenditure behavior of each interconnected account (Figure A1).

Figure A1: Full Social Accounting Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
		Agriculture	Industry	Services	Labor	Capital	Households 1	Households 2	Corporate	Private Investment	Gov. Consumption	Gov. Investment	Taxes	Gov. Account	External Income Account	
1	Agriculture	A11	A 12	A13			CP11	CP21		IP1	CG1	IG1			X1	Y1
2	Industry	A21	A22	A23			CP12	CP22		IP2	CG2	IG2			X2	Y2
3	Services	A31	A32	A33			CP13	CP23		IP3	CG3	IG3			X3	Y3
4	Labor	W1	W2	W3												Y4
5	Capital	P1	P2	P3												Y5
6	Households 1				WH1	PH1			BH1					TranG-H1	N.Remit1	Y6
7	Households 2				WH2	PH2			BH2					TranG-H2	N.Remit2	Y7
8	Corporate					PB								TranG-C	IncF-C	Y8
9	Private Investment						SavH1	SavH2	SavCorp					SavGov	N.F.Bor	Y9
10	Gov Consumption													CG		Y10
11	Gov Investment													IG		Y11
12	Taxes	IndTx1	IndTx2	IndTx3			IncTx1	IncTx2	CorpTx							Y12
13	Gov. Account						TranH1-G	TranH2-G	TranCorp-G				TAX		TranF-G	Y13
14	External Income Account	M1	M2	M3			CP1M	CP2M	IncC-F	IMP	CGM	IGM		TranG-F		Y14
	Total	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	

Source: Sussangkarn and Tinakorn (1999)

The main focus of this study is to estimate the impact of Grab services on the Thai economy by constructing a two-sector Social Accounting Matrix representing the interaction between household sectors and business sectors.

More specifically, the business sectors are categorized into 180 subsectors, which are typically used in this type of analysis. The household sector consists of labor households receiving wages as their main source of income, resulting in a 181-by-181 Social Accounting Matrix (Figure A2).



Figure A2: A two-sector 181-by-181 Social Accounting Matrix

	Production Sectors	Household Bloc
Production Sectors	180 × 180 Thai Economic Classification	
Household Bloc		1 × 1 Labor HH

Source: TDRI's Illustration.

To estimate the impact of Grab services on the Thai economy, this study creates additional accounts to represent the interaction between Grab, its partners (merchants and drivers), and the rest of the economy (other accounts). In this approach, Grab interacts with the economy through two important channels:

1. **Expenditure Channel:** Grab directly purchases intermediate inputs for its operations (such as office equipment).
2. **Income Channel:** Grab operations generate income for its partners, which creates additional demand for intermediate inputs as well as increased consumption demand due to rising household income (Figure A3).

Figure 3: A Social Accounting Matrix with Grab accounts

	Production Sectors	Household Bloc	Grab Partners	Grab
Production Sectors	I/O data	SES data	Expense	
Household Bloc	I/O data			
Grab Partners	Income (Grab data)		Grab & Partners	
Grab				

Source: Author's Illustration

To fill in the data in the matrix, the input-output data from the NESDC can be directly entered into their corresponding accounts, while household spending on businesses from the SES database needs to be itemized to match with the production sectors—tedious but quite straightforward.

To input the data for the Grab and its partners' accounts, the company's financial data provides insights into the interaction between Grab and its partners, as well as the key expenditure items that Grab purchased for its operations. The remaining unfilled data is the expenditure of Grab's partners, which is not observed through Grab's database or any other database. This study uses the average value of the corresponding industries of Grab's partners as the expenditure of Grab's partners. Specifically, for GrabFood, we used data from the restaurant and drinking sector; for GrabMart, we used data from the retail trade sector; for GrabRide, we used data from the road passenger transport sector; and for GrabExpress, we used data from the postal sector. It should be noted that the expenditures incurred by Grab and its partners are deducted from the corresponding business and household accounts to avoid double counting.

The construction of the matrix is then completed.

## **Appendix B: Indirect and Induced impact calculation**

Let  $A_{type I}$  be a one-sector Social Accounting Matrix with only production sectors (including Grab and Partners accounts).

Let  $A_{type II}$  be a two-sector Social Accounting Matrix with production sectors (including Grab and Partners accounts) and household sectors.

Define Matrices  $B_{type I}$  and  $B_{type II}$  as follows:

$$B_{type I} = (I - A_{type I})^{-1}$$

$$B_{type II} = (I - A_{type II})^{-1}$$

It follows that the column sum of Grab Thailand's account in  $B_{type I}$  is the output multiplier created by Grab services, representing the total additional demand for intermediate inputs, as well as the initial intermediate demand from Grab. Therefore, this multiplier consists of an initial output multiplier plus the remaining industrial spillover effect, which is referred to as the indirect impact.

$B_{type II}$  is the output multiplier that accounts for the multiplier effect represented in  $B_{type I}$  and also measures the extra output value induced by higher household demand for goods and services due to increased household wages.

That is, the induced impact of Grab services is calculated by subtracting the column sum of  $B_{type I}$  from the column sum of  $B_{type II}$ .

The column sum of Grab's partners (merchants and drivers) is also defined in the same manner, using Grab Partner accounts instead.

## **Appendix C: Mathematical formulas for the outcome metrics**

**All outcome metrics in the analysis are rounded down to provide a conservative estimate of the impact.**

### **1. GDP impact**

**GDP impact** = direct impact + indirect impact + induced impact

**Direct impact** = 3 inputs for operations (land, labor, capital investment) + business profit

**Indirect impact**

= The column sum of [Grab account in  $B_{type I}$  x GDP share of gross output for each corresponding industry] x Grab's initial demand

+ The column sum of [Merchants account in  $B_{type I}$  x GDP share of gross output for each corresponding industry] x Merchants' initial demand

+ The column sum of [Drivers account in  $B_{type I}$  x GDP share of gross output for each corresponding industry] x Drivers' initial demand

- direct impact

**Induced impact**

= The column sum of [Grab account in [ $B_{type II} - B_{type I}$ ] x GDP share of gross output for each corresponding industry] x Grab's initial demand

+ The column sum of [Merchants account in [ $B_{type II} - B_{type I}$ ] x GDP share of gross output for each corresponding industry] x Merchants' initial demand

+ The column sum of [Drivers account in [ $B_{type II} - B_{type I}$ ] x GDP share of gross output for each corresponding industry] x Drivers' initial demand

## 2. Increased household income

**Increased household Income** = direct channel + indirect channel

**Direct impact** = Grab's employment costs + driver net earnings (calculated from industry compensation/output ratio) + merchant employment costs (based on industry compensation/output ratio)

**Indirect impact** = The sum of Grab's impact on output for each industry x household income share of each corresponding industry (The calculation was performed using  $B_{type I}$  matrix) – direct channel

**Induced impact** = The sum of Grab's impact on output for each industry x household income share of each corresponding industry (The calculation was performed using  $B_{type II}$  matrix) – Indirect channel

## 3. Earning Opportunities

**Earning Opportunities** = direct channel + indirect channel

**Direct channel** = The number of people employed directly by Grab (both full-time and part-time employees on the payroll), the number of people employed in other companies as a direct result of Grab's business operations, such as financial and business services, as well as the average number of driver-partners who earned an income via the Grab platform at least once a month.

**Indirect channel** = The total employment generated in each industry is calculated by dividing the income generated in each industry by the average salary in that industry. Employment calculations are made separately for merchant-partners and driver-partners, then combined.

#### **4. Multiplier**

Multiplier = (Indirect impact on GDP + Induced impact on GDP) / Direct impact on GDP