Measuring the Size and Cyclical Sensitivity of Automatic Fiscal Stabilizers in Vietnam: Evidence from Budget Semi-Elasticity Estimation

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Abstract: - This paper provides the first internationally comparable estimate of the size and budgetary cyclical sensitivity of automatic fiscal stabilizers in Vietnam, applying the budget semi-elasticity framework of the OECD and the European Commission to a single revenue classification, the OECD Revenue Statistics for Viet Nam, over 2003 to 2024. The framework is given an explicit analytical foundation: the semi-elasticity is derived from the budget identity, and three propositions establish an upper bound that depends only on revenue shares, the effect of labor informality, and the propagation of estimation error. The revenue-side semi-elasticity is estimated at +0.007, with a bootstrap confidence interval of [−0.052, +0.067], and lies within one hundredth of zero in all three sample windows examined; Proposition 1 bounds it below 0.113 under the most generous treatment of the point estimates. The cyclical response of unemployment insurance expenditure cannot be distinguished from zero, in a test with the power to detect a coefficient of 0.11. Combining the two sides with the measured size of general government gives a semi-elasticity of the budget balance of 0.255, with a ninety-five percent interval of [0.194, 0.315], roughly half the European Union average of 0.50. A panel of seven Asia-Pacific economies yields a closely similar estimate of 0.246 (standard error 0.097) once the discretionary stimulus episodes of 2009 and 2020 to 2021 are separated; without that separation, the coefficient doubles. A decomposition against published European figures attributes 87.7 percent of the gap to the size of general government and 39.6 percent to the design of unemployment insurance, with the revenue side working in the opposite direction. What distinguishes Vietnam is therefore not the cyclical behavior of its tax system but the scale of its budget and the reach of its unemployment insurance.

Key-Words: - automatic fiscal stabilizers; budget semi-elasticity; budgetary cyclical sensitivity; government size; tax buoyancy; fiscal policy; Vietnam; ASEAN.

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1 Introduction

Macroeconomic stabilization rests on two distinct arms of fiscal policy. The first is discretionary policy, which requires fresh legislative decisions and is therefore subject to recognition, decision, and implementation lags that often blunt its timeliness. The second is the set of automatic fiscal stabilizers, namely the components of the budget that respond to the business cycle without any new policy action, such as progressive income taxes that take a larger share of income in booms and unemployment benefits that expand in downturns [1], [2]. Because they operate without delay and in both directions, automatic stabilizers constitute the first line of defense against cyclical shocks, cushioning disposable income and aggregate demand before discretionary measures can be designed and enacted.

Two episodes have renewed attention to this channel: the global financial crisis of 2008 and 2009 and the pandemic recession of 2020, the two deepest and most synchronized global downturns since the Second World War. In both, economies endowed with sizeable automatic stabilizers absorbed a larger fraction of household income shocks and relied comparatively less on improvised stimulus packages [3], [4]. The empirical literature is, however, unevenly distributed. Most quantitative evidence concerns advanced OECD economies [5], [6]; evidence for developing economies with large informal sectors remains thin, and systematic estimates for Southeast Asia are almost entirely absent.

Several structural features make Vietnam a useful case. Its revenue system leans heavily on indirect taxes such as the value-added tax and the special consumption tax, whereas the progressive

personal income tax, the single most powerful automatic stabilizer in advanced economies, contributes barely one percent of GDP. Informal employment is estimated at roughly two-thirds of total employment, and most informal workers fall outside the contributory unemployment insurance system [7]. During the pandemic, the country relied predominantly on discretionary support programs rather than on automatic channels, which is itself consistent with a small automatic stabilizer. The cyclical behavior of Vietnamese fiscal policy has been examined in broad terms, and the buoyancy of its tax system has been estimated within large multi-country panels [8], but no study to date has measured the budgetary cyclical sensitivity of Vietnamese public finances with the semi-elasticity framework that underpins international comparison, or decomposed it into its tax and expenditure components.

This paper does so, and it makes three contributions. The first is analytical. The semi-elasticity is derived from the budget identity rather than stated as a definition, and three propositions, proved in Appendix A, give the argument a structure that does not depend on the precision of any single point estimate: an upper bound on the revenue-side semi-elasticity that requires only revenue shares and the largest component elasticity, a comparative static for the effect of labor informality, and an exact variance formula for the propagation of estimation error from component elasticities into the aggregate. The second contribution is empirical. Component elasticities are estimated with the two-step procedure of the OECD and the European Commission on a single, internationally standardized revenue classification; buoyancies and elasticities are reported separately throughout, the cyclical response of unemployment insurance expenditure is estimated with full inference and a power analysis, and the semi-elasticity of the balance is computed with confidence intervals and set against a rebuilt panel of seven Asia-Pacific economies. The third contribution is a decomposition. Measured on identical definitions, the difference between the Vietnamese semi-elasticity of 0.255 and the European average of 0.50 is attributed, in the arithmetic of the budget identity, overwhelmingly to the size of general government and to the design of unemployment insurance, and not to the cyclical behavior of the tax system, whose contribution is in fact slightly more favorable than the European one.

That last sentence states the central finding of the paper in one line: what distinguishes Vietnam from the economies ordinarily used as a reference is not the cyclicality of its taxes but the scale of its budget and the reach of its unemployment insurance system. The rest of the paper establishes this claim and traces what it does and does not imply for policy.

2 Literature Review

2.1 Theoretical Foundations

The conceptual basis of automatic stabilization is the cyclical sensitivity of tax revenue and certain expenditure categories to economic activity. Progressive income taxation, social insurance contributions, and income-tested transfers move with the cycle by construction, smoothing disposable income without any change in the underlying rules [1], [9]. The classic argument that stabilizing disposable income stabilizes aggregate demand has been refined by general equilibrium analysis. [10] embed the main United States stabilizers in a model that combines incomplete markets with nominal rigidities and find that the disposable-income channel is quantitatively small, whereas programs that affect inequality and social insurance exert a larger influence on aggregate volatility. In a companion contribution, [11] characterize the optimal design of stabilizers, underscoring that their effectiveness depends on the interaction between household heterogeneity and the monetary regime. This body of work cautions that the headline size of a stabilizer and its true stabilizing effectiveness need not coincide, a distinction that Section 6 of this paper treats explicitly and that governs how far its conclusions reach.

2.2 Measuring Stabilizers: The Budget Semi-Elasticity

Two related indicators dominate the measurement literature. Budgetary sensitivity expresses the change in the budget balance in money terms for a given change in output, whereas the budget semi-elasticity expresses the change in the balance as a ratio to GDP for a one percentage point change in the output gap [12]. The semi-elasticity is preferred for cross-country comparison: it is scale-free, and it decomposes cleanly into the contributions of individual taxes. The reference methodology was set out in [5] for the OECD and subsequently refined for the European Union framework in [13]. In this approach, the aggregate semi-elasticity is built up from the elasticities of individual revenue categories with respect to their tax bases and of those bases

with respect to the output gap, together with the elasticity of cyclical expenditure. For the European Union, [14] report an average balance semi-elasticity of 0.50 and decompose it, a decomposition this paper uses as its external benchmark, and [15] update the underlying semi-elasticities and warn that the balance semi-elasticity is frequently confused with its revenue-side component, a confusion that Section 5 shows to be consequential.

Two related strands must be kept distinct from this one. The tax buoyancy literature, of which [8] is the most comprehensive recent example and one that reports estimates for Vietnam, measures the raw response of receipts to output, inclusive of discretionary policy changes, and its authors caution explicitly that buoyancy mixes automatic and legislated variation. The cyclically adjusted balance used in International Monetary Fund surveillance and structural model simulations offers an alternative route to the same object. The semi-elasticity approach is retained here because it offers the most transparent decomposition and the most economical data requirements, which suits a data-constrained setting such as Vietnam, but the distinction between buoyancy and elasticity is maintained throughout the estimation, as Section 4.2 describes.

2.3 Empirical Evidence across Economies

Evidence for advanced economies indicates substantial stabilization. [3] show that automatic stabilizers absorb a considerably larger share of income shocks in Europe than in the United States, reflecting more progressive tax-and-transfer systems, and [6] document meaningful but heterogeneous stabilization across OECD countries, with direct taxes contributing more than social spending. The picture for developing economies is markedly different. Where informality is widespread and revenue depends on indirect taxes, automatic stabilizers are weaker, as documented in [16] for Latin America, and [4] finds that emerging economies stabilize output substantially less than advanced economies. The pandemic reinforced this divide: automatic channels absorbed a large fraction of the shock in the euro area but a much smaller fraction in developing economies, where discretionary transfers had to fill the gap. Semi-elasticity estimates for Southeast Asia, and for Vietnam in particular, remain almost entirely missing from this body of work.

2.4 Research Gap

The existing work leaves three questions open that this study takes up. First, although buoyancy estimates for Vietnam exist within multi-country panels [8], no internationally comparable semi-elasticity estimate exists, and buoyancy is not a substitute for one: it conflates automatic and discretionary variation, and it carries no decomposition into the budget identity. Second, no study decomposes the cyclical response of the Vietnamese budget into its tax and expenditure components on a single revenue classification. Third, no systematic comparison situates Vietnam among structurally similar Asia-Pacific economies with inference appropriate to a small panel. The analytical framework of Appendix A, summarized in Section 4.1, addresses a fourth gap of a different kind: the semi-elasticity literature typically states its central formula as a definition, and this paper derives it, bounds it, and propagates estimation uncertainty through it.

3 Institutional Background and Fiscal Structure of Vietnam

The magnitude and the channels of automatic stabilization in Vietnam follow directly from the structure of its public finances. This section describes the revenue structure, the expenditure and social protection system, and the labor market characteristics that shape how cyclically the budget responds.

3.1 Revenue Structure

Vietnamese tax revenue is dominated by taxes on goods and services, principally the value-added tax, the special consumption tax, and trade taxes, whereas the personal income tax accounts for a far smaller share than is typical in OECD economies. Figure 1 (Appendix) shows the composition of the OECD classification used throughout the estimation. Over 2003 to 2024, the personal income tax averaged 1.0 percent of GDP against 4.6 percent for the value-added tax and 3.6 percent for excises and other consumption taxes; the corporate income tax, at 4.8 percent on average, has declined from its mid-2000s peak as oil-related profits shrank and statutory rates were cut in 2009, 2014, and 2016. The composition has shifted appreciably over the sample period. Receipts from crude oil have declined as a share of the total, the value-added tax has gained prominence, and the personal income tax has expanded gradually in step with rising per capita income, from 0.4 percent of GDP in 2003 to 1.6 percent in 2024. This composition matters for stabilization because taxes on consumption are broadly proportional to their base and therefore less

cyclically responsive than a progressive income tax, so the revenue side of the Vietnamese budget delivers comparatively limited automatic smoothing relative to output.

3.2 Expenditure Structure and Social Protection

On the expenditure side, the contributory unemployment insurance scheme was created by the Law on Social Insurance 71/2006/QH11, in force from January 2009, and its coverage remains limited to formal sector employees with labor contracts, with bounded benefit levels and durations. Because entitlement requires twelve months of contributions, the first benefits were paid in 2010. Benefit expenditure averaged 0.15 percent of GDP over 2010 to 2024 and 0.29 percent over 2021 to 2024, an order of magnitude below the corresponding programs in the European Union. Recurrent social assistance and support for poor households are likewise modest as a share of GDP. The behavior of the budget during the global financial crisis and during the pandemic years of 2020 and 2021 shows a heavy reliance on discretionary support, including the payment of pandemic assistance from the accumulated surplus of the Unemployment Insurance Fund under Resolution 03/2021/UBTVQH15, rather than on automatic transfers, which is consistent with a small expenditure-side stabilizer.

3.3 Labor Market Characteristics

The defining feature of the Vietnamese labor market for the purposes of this study is the large informal sector. The ILOSTAT harmonized series places informal employment at 67.0 percent of total employment in 2024 [18]; the national statistics office, on a definition that treats agricultural household labor differently, reports 63.9 percent [7]. In either figure, the majority of workers neither contribute to unemployment insurance nor fall within the personal income tax net. The direct implication is that income shocks affecting informal workers are not cushioned by automatic stabilizers, so the effective stabilization delivered by the budget is weaker than headline tax-and-transfer ratios would suggest. Proposition 2 of the analytical framework formalizes this channel and quantifies, in Section 5.2, how much formalization could change the revenue-side response.

4 Methodology and Data

4.1 The Semi-Elasticity Derived from the Budget Identity

Let Y denote nominal output, B the general government balance, R_i revenue category i, and G cyclical expenditure, so that B equals total revenue less expenditure. Writing the balance ratio as b = B/Y, the category ratios as s_i = R_i/Y and s_G = G/Y, and differentiating the balance ratio with respect to the output gap y, Appendix A obtains the semi-elasticity of the balance:

$$\varepsilon_B = \Sigma_i s_i (\eta_i - 1) - s_G (\eta_G - 1) \quad (1)$$

where η_i is the output elasticity of category i and η_G that of cyclical expenditure. Each revenue category enters through the product of its weight in output and the deviation of its elasticity from unity, so a category raises the cyclical sensitivity of the balance ratio only when its elasticity exceeds one. Cyclical expenditure enters with the opposite sign, because an expenditure elasticity below unity, the normal case for unemployment-related transfers, raises the deficit in a downturn.

Appendix A proves three propositions on this structure, and they carry the argument of the paper. Proposition 1 bounds the revenue-side term ε_R = Σ_i s_i (η_i − 1) above by s_S (η_max − 1), where s_S is the combined output share of the categories with elasticity above unity and η_max the largest elasticity; the bound requires no estimate of the aggregate and is therefore immune to the imprecision of short annual samples. Proposition 2 shows that when the progressive taxes and contributory transfers reach only the formal sector, ε_R is increasing in the formal employment share, which yields both a counterfactual for Vietnam and a comparative static testable across economies. Proposition 3 gives the exact variance of the estimated ε_R as s′Ωs, the delta method applied to a linear function, and motivates the bootstrap that supplements it. Throughout the paper, buoyancy denotes the raw response of receipts to output, inclusive of legislated change, and elasticity denotes the response net of legislated change; the two are estimated and reported separately and never used interchangeably.

4.2 Two-step Estimation of Component Elasticities

For each revenue category, the output elasticity is the product of the elasticity of receipts with respect

to the category's own base and the elasticity of that base with respect to output:

$$\eta_i = \eta_{i,B} \times \eta_{B,Y} \quad (2)$$

The bases follow the OECD convention adapted to available Vietnamese series: final consumption expenditure for the value-added tax and for excises, imports of goods and services for trade taxes, and output itself for the two income taxes and for social contributions, whose administrative bases cannot be observed consistently over the sample. Both steps are estimated in first differences of logarithms with an intercept, with standard errors robust to heteroskedasticity and first-order autocorrelation, and the two steps are combined by the delta method. First differencing is a deliberate choice, and Appendix C documents the diagnostics behind it. Augmented Dickey-Fuller, Phillips-Perron, and KPSS tests treat all series as integrated of order one. Cointegration between receipts and bases is then examined with Engle-Granger and Johansen tests and with the bounds procedure in [19], whose critical values are re-simulated for the actual sample lengths of 15 to 22 observations because the asymptotic values over-reject severely at that length. The evidence for a stable long-run relation is suggestive but not decisive, so estimation proceeds in differences, which is consistent whether or not cointegration holds, at the cost of identifying a short-run response. Elasticities add indicator variables, entered in differences, for the legislated changes affecting each category: the Personal Income Tax Law of 2007 effective in 2009, the Corporate Income Tax Law of 2008 and its amendments of 2013 and 2016, the 2014 amendments to the indirect tax laws, and the amended Law on Special Consumption Tax 106/2016/QH13. Appendix B lists the reform history with effective dates; Appendix D shows that the results are insensitive to the choice of excise indicator.

4.3 The Output Gap

Four measures of the output gap are computed and reported side by side, so that no conclusion rests on a single filter applied to twenty-five annual observations that include a pandemic. The baseline applies the Hodrick-Prescott filter to the logarithm of real GDP with the smoothing parameter set to 6.25, following the frequency adjustment proposed in [20], and defines the gap as

$$\text{gap}_t = 100 \times (\ln Y_t - \ln Y^*_t) \quad (3)$$

where Y^*_t is potential output. The alternatives are the same filter with the older annual convention of 100, the regression filter proposed in [21] with a two-year horizon and four lags, and a quadratic trend. End-of-sample bias is treated rather than acknowledged: each real output series is extended to 2031 with the growth forecasts of the April 2026 World Economic Outlook [22] before filtering, and the forecast years are then discarded. Figure 2 (Appendix) plots the four measures for Vietnam. They agree on the sign of the gap in most years and differ most in the amplitude of the pandemic trough, and every cyclical estimate in the paper is reported under all four.

4.4 The expenditure Equation

The cyclical expenditure component is estimated directly. Let U denote unemployment insurance benefit expenditure deflated by the GDP deflator. The baseline regresses the logarithm of U on the output gap, a linear trend that absorbs the expansion of scheme coverage, and an indicator for the discretionary support payments of 2021, on the sample 2010 to 2024, with HAC standard errors. Ten specifications vary the gap measure, the dynamics, and the sample. Because the scheme changed with the Employment Law of 2013, in force from May 2015, and with Resolution 03/2021/UBTVQH15, structural stability is tested with Chow tests at the two institutional dates and with a sup Wald test over all interior break dates, whose null distribution is simulated for the actual sample length; the multiple-break procedure in [24] is not informative with fifteen observations. Because a null result on a short sample invites the objection that the test simply lacks power, the minimum coefficient detectable with probability 0.80 is computed and reported alongside the estimates.

4.5 From Components to the Balance

The remainder of expenditure is treated as acyclical in money terms, the convention of the European Commission methodology, so that it contributes its share in output to the semi-elasticity of the balance. Equation (1) then takes the operational form $\varepsilon_B = \varepsilon_R + s_G - s_U \eta_U$, where s_U is the share of unemployment insurance benefits in output and η_U is their estimated elasticity. Vietnam does not publish a general government expenditure series on a consistent definition for the whole period, so s_G is measured two ways: the state budget expenditure ratio compiled on the Government Finance Statistics format in successive IMF Article IV consultations, and that ratio augmented by the expenditure of the

extrabudgetary funds and Vietnam Social Security, which staff tables place between 5.1 and 6.4 percent of output. Results are reported for both concepts and for the bounds of the extrabudgetary range. Uncertainty in ε_R and in η_U is propagated into ε_B by simulation, treating the expenditure ratios as measured.

4.6 Identification: Separating Automatic from Discretionary Responses

A regression of receipts, spending, or the balance on the output gap recovers the total cyclical association, which mixes the automatic response with any discretionary response correlated with the cycle. The identification strategy of this paper addresses the mixture at three points rather than leaving it as a caveat. On the revenue side, legislated changes are absorbed by the reform indicators of Section 4.2, and buoyancies, which include them, are reported next to elasticities, which exclude them. On the expenditure side, the discretionary payment of pandemic support from the Unemployment Insurance Fund in 2021 is absorbed by an indicator. In the panel of Section 4.7, the stimulus episodes of 2009 and of 2020 and 2021 are absorbed by indicators, and the aggregate regression is interpreted throughout as an upper bound on the automatic component and used as a consistency check on the structural calculation, not as the primary estimate. The primary estimate of the Vietnamese semi-elasticity is the component-based calculation of Section 4.5, whose ingredients are identified net of legislated change.

4.7 The Asia-Pacific panel

To situate Vietnam within its region, a panel of seven economies, Indonesia, Thailand, the Philippines, Malaysia, Vietnam, Korea, and China, is assembled for 2000 to 2024, 175 country-year observations without gaps. The estimating equation is

$$b_{i,t} = \alpha_i + \beta \cdot gap_{i,t} + \gamma' d_{t} + \varepsilon_{i,t} \quad (4)$$

where b_{i,t} is general government net lending as a percent of GDP from the April 2026 World Economic Outlook [22], α_i are country effects, and d_t are indicators for 2009 and for 2020 and 2021; a further specification adds year effects, which identifies β from cross-country variation within years. Inference with seven clusters is treated with the care it requires. Four covariance estimators are reported for every specification: clustering by country with the reference distribution taken as t with six degrees of freedom, the spatial correlation consistent estimator in [25], Newey-West on the pooled moments, and the wild cluster bootstrap in [26] with the null imposed and 9,999 replications, which is the procedure appropriate to few clusters and the p-value the reader is asked to rely on. Exact p-values are reported throughout instead of significance claims. A fully interacted specification recovers country-specific slopes, and a final cross-sectional regression relates those slopes to the size of general government, measured by total expenditure from the April 2026 Fiscal Monitor [27], and to an informality proxy, testing the comparative statics of Proposition 2 and the size mechanism of equation (1) across economies.

4.8 Data

Every Vietnamese revenue category is drawn from a single source, the OECD Revenue Statistics in Asia and the Pacific, general government, 2003 to 2024 [17], so that the components and the aggregate rest on one classification; an earlier draft mixed this source with a domestic administrative series, and the two differ by 12 to 19 percent in mean absolute terms on the overlapping years, which is documented, with the correction, in Appendix C. National accounts are from the General Statistics Office through the World Bank World Development Indicators [23]; the nominal series is spliced at 2010 to remove the level break created by the December 2019 benchmark revision, with the splice factor of 1.2697 documented and independently verified in Appendix B. Unemployment insurance receipts and payments for 2010 to 2023 are taken from the report of the Ministry of Labour, Invalids and Social Affairs on the implementation of the Employment Law, and for 2024 from the Government report on the financial plans of the extrabudgetary state funds; Appendix D reports, year by year, the differences from the rounded series used in an earlier draft. Expenditure ratios are from IMF Article IV fiscal tables, cross-checked against the Fiscal Monitor indicator where coverage allows. Table 1 (Appendix) reports descriptive statistics on these definitions, with the estimation window and the number of observations stated for every variable, and Appendix B records the source, sample window, and access date of each series.

5 Results and Discussion

5.1 Buoyancies and Elasticities of the Revenue Categories

Table 2 (Appendix) reports, for each category, the buoyancy and the reform-adjusted elasticity estimated by the two-step procedure on the full sample, together with the average share in GDP and the contribution to the revenue-side semi-elasticity. Figure 3 (Appendix) plots the elasticities with their confidence intervals. Two categories have point estimates above unity: the personal income tax, at 1.79 (standard error 0.46), and the corporate income tax, at 1.21 (0.19). The value-added tax, at 0.85 (0.21), excises, at 0.91 (0.34), and trade and other goods and services taxes, at 0.71 (0.43), lie at or below unity. Social security contributions, observable only from 2010, have an elasticity of 1.17 (0.41), indistinguishable from one. The wedge between buoyancy and elasticity is largest for the corporate income tax, 1.42 against 1.21, and reflects the statutory rate cuts of 2009, 2014, and 2016; conflating the two quantities would overstate the automatic responsiveness of exactly the category where legislated change was most active, the concern that the tax buoyancy literature itself raises [8].

The earlier version of this paper described the personal and corporate income taxes as the system's two stabilizing instruments on the basis of a similar ordering. The revised estimates keep the ordering but discipline the language: these are the categories whose estimated elasticity exceeds unity, their combined weight is 5.8 percent of GDP, and what that weight implies is a matter of arithmetic, not of labels, as the next subsection shows.

5.2 The Revenue-Side Semi-Elasticity is Close to Zero, and Bounded

Summing the contributions in Table 2 (Appendix) gives a revenue-side semi-elasticity of +0.007 for 2003 to 2024. The bootstrap in Appendix C, which resamples jointly across the component equations in 10,000 replications, yields a standard error of 0.031 and a 95% interval of [−0.052, +0.067]. The two shorter windows examined give −0.007 (2010 to 2024) and +0.000 (excluding the pandemic years). The three point estimates span a range of 0.014, and each lies within one hundredth of zero. Nothing in what follows uses the sign of ε_R, which the data do not establish; everything uses the fact that it is small, which the data establish with precision. Across 30,000 bootstrap replications spanning the three windows and two resampling schemes, no draw exceeds 0.38, and in the full sample the largest of 10,000 draws is 0.17.

Proposition 1 turns this from a sample property into a structural one. Total tax revenue excluding contributions averages 14.4 percent of output, and the categories with estimated elasticity above unity average 5.8 percent between them. With the largest elasticity at its point estimate of 1.79, the bound gives ε_R at most 0.046; applying the same bound to all tax revenue, as if every category had the largest elasticity, gives at most 0.113; substituting the upper limit of the 95 percent confidence interval of the largest elasticity raises these to 0.099 and 0.244. Even the most permissive of these figures is half the European balance semi-elasticity, and the natural ones are an order of magnitude smaller. The bound holds for any configuration of elasticities consistent with the estimates and is therefore not subject to the sampling variability that afflicts the point estimate.

Proposition 2 quantifies the informality channel on the same footing. With formal employment at 36 percent of the total, evaluating the counterfactual of complete formalization, holding rate structure and revenue composition fixed, raises ε_R from +0.007 to +0.034 in the full sample. Formalization of the entire labor force would therefore move the revenue-side response by less than four hundredths of a percentage point of output per point of the output gap. The informality channel is real, but on the revenue side it is small, because the categories it operates through are small.

5.3 The Expenditure Side: A Precisely Estimated Near-Zero

The cyclical response of unemployment insurance expenditure is reported in full in Appendix D and summarized here. In the preferred specification, the coefficient on the output gap is −0.073 with a standard error of 0.124; on the sub-sample from 2013, after the estimated structural break, it is +0.001 with a standard error of 0.035. The sign changes across the four gap measures, and no specification places the coefficient more than one standard error from zero. The one conventionally significant coefficient in the ten specifications, a positive response to the lagged gap, carries the wrong sign for a stabilizer and is read as the imprint of coverage expansion, which proceeded fastest in the years of strongest growth. Structural break tests locate a break in 2013, in the level and trend of expenditure, as the expansion of a young scheme would produce; restricted to the gap coefficient alone, the test statistic is 0.04 with a p-value of 0.85,

so the cyclical response is stable and close to zero on both sides of the break.

The power analysis is what makes this a finding rather than an absence. On the post-2013 sample, the test would detect a true coefficient of 0.11 with probability 0.80, and a response of the size implied by European unemployment benefits, several times the scheme's own value per point of the output gap, with probability indistinguishable from one. The data are not silent; they speak, and what they say is that the cyclical response of Vietnamese unemployment insurance expenditure is small by a margin the sample is well able to resolve. The substantive reason is plain: benefits averaging 0.29 percent of output cannot carry a material cyclical response, whatever their elasticity.

5.4 The Semi-Elasticity of the Balance

Combining the revenue-side estimate, the unemployment insurance elasticity, and the measured size of government in the operational form of Section 4.5 yields the semi-elasticity of the Vietnamese balance. Table 3 (Appendix) reports it under the two expenditure concepts and, for the general government concept, the bounds of the extrabudgetary range. On the narrow state budget concept, with expenditure at 19.1 percent of output on the latest vintage, the semi-elasticity is 0.197 with a ninety-five percent interval of [0.137, 0.258]. On the general government concept at the midpoint of the extrabudgetary range, with expenditure at 24.8 percent of output, it is 0.255 with an interval of [0.194, 0.315]. Using the post-revision revenue sample or excluding the pandemic years moves these figures by less than 0.015 in absolute value, and the choice between the two unemployment insurance specifications changes them by less than 0.001, because the scheme's share of output is so small.

The comparison that this number invites has to be drawn with the right benchmark, and the distinction matters enough to state in the text. The figure of 0.50 that the European Commission reports for the average Member State is the semi-elasticity of the balance, equation (1) in full, not of its revenue component [14], [15]. On the revenue side, the European semi-elasticity is itself close to zero, indeed slightly negative once indirect taxes and social contributions are set against the progressive direct taxes; almost the whole of the European 0.50 is carried by the expenditure side, whose contribution reflects, in the words of the published decomposition, the economic size of government spending at around 46 percent of GDP [14]. A revenue-side semi-elasticity near zero therefore does not distinguish Vietnam from the reference economies at all. What distinguishes Vietnam is the balance semi-elasticity, 0.255 against 0.50, and the European average lies outside the confidence interval of every row of Table 3 (Appendix). Where that difference comes from is the subject of Section 5.6.

5.5 The Asia-Pacific panel

Table 4 (Appendix) reports the panel estimates. The raw fixed effects coefficient is 0.509. Adding indicators for the stimulus episodes of 2009 and 2020 to 2021 cuts it to 0.246, with a cluster standard error of 0.097 and a wild cluster bootstrap p-value of 0.026. Half of the apparent cyclical sensitivity of the regional budget balance is thus the discretionary response to two episodes, and any estimate that does not separate the two overstates the automatic component by a factor of two. This quantifies, rather than merely acknowledges, the identification concern raised in Section 4.6. The estimate is stable across the four covariance estimators, whose standard errors agree to within 0.005 in the preferred specification; across the four output gap measures, under which the coefficient ranges from 0.24 to 0.28; under the removal of the forecast splice; and under year fixed effects, which raise it to 0.269 with a wider interval.

Three comparisons anchor the Vietnamese results. First, the regional coefficient of 0.246 and the structural Vietnamese calculation of 0.255 are obtained from different data by different methods, and they agree to within one hundredth; the agreement is recorded as a consistency check, not presented as a formal test, since the panel estimate is regional and remains an upper bound on the automatic component. Second, the country-specific Vietnamese slope in the fully interacted specification is 0.301 with a standard error of 0.100, again consistent with the structural value. Third, the earlier version of this paper reported a Vietnamese slope of 0.816, which a reviewer rightly found difficult to reconcile with weak automatic stabilization; on the rebuilt balance series and with the discretionary episodes absorbed, the slope is a third of that figure, and the discrepancy is fully accounted for by the undocumented balance series and the omitted stimulus indicators.

Figure 4 (Appendix) plots the country-specific slopes against the size of general government, together with the prediction of equation (1) that, with revenue-side terms near zero, the semi-elasticity should approximate the expenditure share. The correlation between the structural prediction and the estimated slopes is 0.76 across the seven

economies, and the European Union average sits almost exactly on the predicted line. A cross-sectional regression of the slopes on the expenditure share gives a coefficient of 3.83 with a p-value of 0.045 and explains 59 percent of the variance; the informality proxy explains nothing on its own, with a p-value of 0.69. The fragility of a seven-observation cross-section is reported before a reader asks: omitting China, which has both the largest budget and the largest slope, reduces the coefficient to 1.29 with a p-value of 0.70, and omitting any other economy leaves it between 3.8 and 4.1. The cross-section is consistent with the size mechanism and is driven by one influential observation; it corroborates the accounting decomposition of the next subsection without establishing it independently. The comparative static of Proposition 2 is not confirmed in this cross-section, a negative result reported rather than omitted; the proposition concerns the revenue-side term, which is small everywhere in this sample, so the cross-section has no power to detect it.

5.6 Where Vietnam Differs: A Decomposition on Identical Definitions

Table 5 (Appendix) decomposes the gap between the Vietnamese balance semi-elasticity of 0.255 and the European average of 0.50, using the published European decomposition in [14] and splitting the Vietnamese expenditure side the same way, so that the two columns are formed on identical definitions. Every European entry is a published figure rather than an assumption: non-unemployment expenditure contributes 0.46, unemployment-related expenditure almost 0.10, and the revenue side is the residual −0.06 required to reproduce the average of 0.50.

The gap of 0.245 divides into three parts of very different size and very different character. Expenditure other than unemployment-related spending accounts for 87.7 percent of it, and that term is nothing other than the size of general government: 24.8 percent of output in Vietnam against 46 percent in the European Union. Unemployment-related expenditure accounts for a further 39.6 percent, far more than its own size would suggest, because European unemployment benefits are strongly counter-cyclical whereas the Vietnamese scheme, as Section 5.3 shows, is not. The revenue side works in the opposite direction, and the point deserves to be stated plainly: the Vietnamese revenue system contributes slightly more to the cyclical sensitivity of the balance than the European one does, because the European revenue contribution is itself negative once indirect taxes and social contributions are set against the progressive direct taxes. The cyclical behavior of the tax system, the presumptive culprit in the earlier version of this paper, turns out to be the one component where Vietnam does not lag.

6 Policy Discussion: Size, Design, and What the Estimates Do Not Say

6.1 Size is Not Effectiveness

Before any policy reading, a distinction that the measurement literature insists on [11], [14] must be made explicit, because it bounds every statement in this section. The semi-elasticity is a property of the budget: it measures how much of a given output fluctuation the balance absorbs. It is not a measure of how well household disposable income is protected against a specified shock, which depends on which households the taxes and transfers reach, on their marginal propensities to consume, and on the interaction with monetary policy [10], [11]. The two can diverge sharply, and in an economy where two-thirds of employment is informal they almost certainly do: the households most exposed to cyclical risk are precisely those outside the tax net and the insurance system, so the aggregate semi-elasticity, whatever its value, overstates the protection reaching them. This paper measures the budgetary quantity, titled accordingly, and draws conclusions only about it. Measuring the household-level effectiveness of Vietnamese stabilizers would require microsimulation on household survey data, which Section 7 identifies as the natural next step.

6.2 What the Arithmetic Identifies

Within that boundary, the decomposition of Table 5 (Appendix) supports three statements, and they are statements of arithmetic about equation (1) rather than recommendations. First, the cyclical properties of the Vietnamese tax system are not the binding constraint. The revenue-side semi-elasticity is within a hundredth of zero, as it is in the European Union; Proposition 1 bounds it below 0.113 under assumptions far more generous than the estimates warrant; and Proposition 2 shows that even complete formalization of the labor force, holding the rate structure fixed, would move it by less than 0.04. Reforms aimed at the cyclical responsiveness of individual taxes therefore operate on the smallest term in the identity. Second, the largest single term in the difference from the European benchmark is the scale of general government, which accounts for 87.7 percent of the gap: giving Vietnam the European size of non-unemployment expenditure,

changing nothing else, would raise the semi-elasticity from 0.255 to 0.470. Whether a larger state is desirable is a question of growth strategy, allocative efficiency, and political economy on which the semi-elasticity is silent; the arithmetic says only that no combination of tax-design changes can close a gap that is located in the scale factor.

6.3 Unemployment Insurance: A Small Instrument with A Large Return

The third statement concerns the one instrument where design, rather than scale, is decisive. A scheme with European coverage and European counter-cyclicality of benefits would close 39.6 percent of the gap, raising the semi-elasticity from 0.255 to 0.352, from a base of less than one third of one percent of output. That is a large return on a small instrument, and it contrasts with the reading in the earlier version of this paper, which treated the expenditure side as negligible. It is negligible as a current magnitude; it is not negligible as an instrument. The practical content of European counter-cyclicality is coverage that extends beyond the formal wage contract and benefits that expand automatically in downturns rather than by resolution, as in 2021. The pandemic experience points to the same bottleneck from the delivery side: support to informal workers had to be improvised precisely because no register or payment infrastructure linked them to the insurance system. Within the short horizon over which the size of the state is fixed, extending unemployment insurance coverage is the reform to which the arithmetic of equation (1) assigns the highest return per unit of expenditure.

What this paper does not establish should be stated with equal clarity. The semi-elasticity is not a welfare measure; a higher value means that the balance absorbs more of a given fluctuation, not that household disposable income is better protected, and the two are distinct in the literature this paper follows. Nor does the calculation weigh the cost of a larger budget against the stabilization it would purchase. The decomposition identifies where the arithmetic of equation (1) locates the difference from the comparison economies, and it constrains which reforms could plausibly change it; the choice among those reforms rests on considerations this paper does not measure.

7. Conclusion

This paper has measured the size and budgetary cyclical sensitivity of automatic fiscal stabilizers in Vietnam with the semi-elasticity framework of the OECD and the European Commission, on a single internationally standardized revenue classification, with an analytical structure of three proved propositions, and within a rebuilt panel of seven Asia-Pacific economies. The estimates form a consistent picture, and it is not the picture the raw data first suggest. The revenue-side semi-elasticity is within one hundredth of zero in every window examined, bounded above by 0.113 under generous assumptions, exactly as it is in the European economies against which Vietnam is compared. The cyclical response of unemployment insurance expenditure is a precisely estimated near-zero, in a test with the power to detect a coefficient one third the size of the European response. The semi-elasticity of the balance is 0.255, with an interval of [0.194, 0.315], roughly half the European average, and a regional panel that separates discretionary stimulus from automatic response, a separation that halves the raw coefficient, independently reproduces the same magnitude. On identical definitions, 87.7 percent of the difference from the European benchmark is the size of general government, 39.6 percent is the design of unemployment insurance, and the tax system works slightly in Vietnam's favor.

The contribution is threefold: the first semi-elasticity estimate for Vietnam with full uncertainty propagation, an analytical framework that insulates the argument from the imprecision of short annual samples in the specific sense that its central claims rest on bounds and shares rather than on point estimates, and a decomposition that relocates the source of weak automatic stabilization from the cyclicality of taxes, where the earlier literature and an earlier version of this paper looked for it, to the scale of the budget and the reach of unemployment insurance.

The study has limitations that qualify how far the estimates travel. The Vietnamese fiscal series required splicing across a major national accounts revision and are short by the standards of the methods applied, which is why inference relies on simulated small-sample critical values, bootstrap procedures, and bounds. The output gap is difficult to estimate for a fast-growing economy subject to large supply shocks, and although every cyclical estimate is reported under four measures, all four are statistical constructs. The expenditure side beyond unemployment insurance is treated as acyclical in money terms by convention rather than estimated. And the analysis is macroeconomic: it measures what the budget absorbs, not who is protected. Two extensions follow naturally: a household-level microsimulation of Vietnamese stabilizers on the Household Living Standards Survey, which would measure the effectiveness that

this paper deliberately does not claim, and a structural model with an informal sector calibrated to Vietnamese conditions, which would allow the positive analysis here to support normative design. Both build on the empirical baseline that this paper set out to establish.

Declaration of Generative AI and AI-assisted Technologies in the Writing Process

During the preparation of this work, the author(s) utilized artificial intelligence (AI) technologies solely for the purpose of linguistic refinement and grammatical correction. Following the application of these tools, the author(s) comprehensively reviewed, verified, and edited the resulting text. The author(s) maintain full accountability and responsibility for the accuracy, integrity, and final content of the publication.

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Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

- Ha Thi Doan Trang conceived the study, formulated the research question, designed the overall methodology and the identification strategy, wrote the manuscript, revised it in response to the reviewers, and served as corresponding author.
- Bui Tien Hanh derived the semi-elasticity from the budget identity, formulated and proved the three propositions in Appendix A, and took part in the revision and final approval of the manuscript..
- Pham Quynh Mai carried out the literature review, the institutional analysis of the Vietnamese revenue, social protection, and labor market systems, compiled the tax reform history in Appendix B, and assembled the fiscal and macroeconomic data.
- Pham Thu Huyen assembled and verified the data, constructed the Asia-Pacific panel, and carried out the estimation, the robustness checks, the bootstrap and simulation exercises, and the Python code that reproduces the tables and figures.

All authors have read and approved the final version of the manuscript.

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Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

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APPENDIX

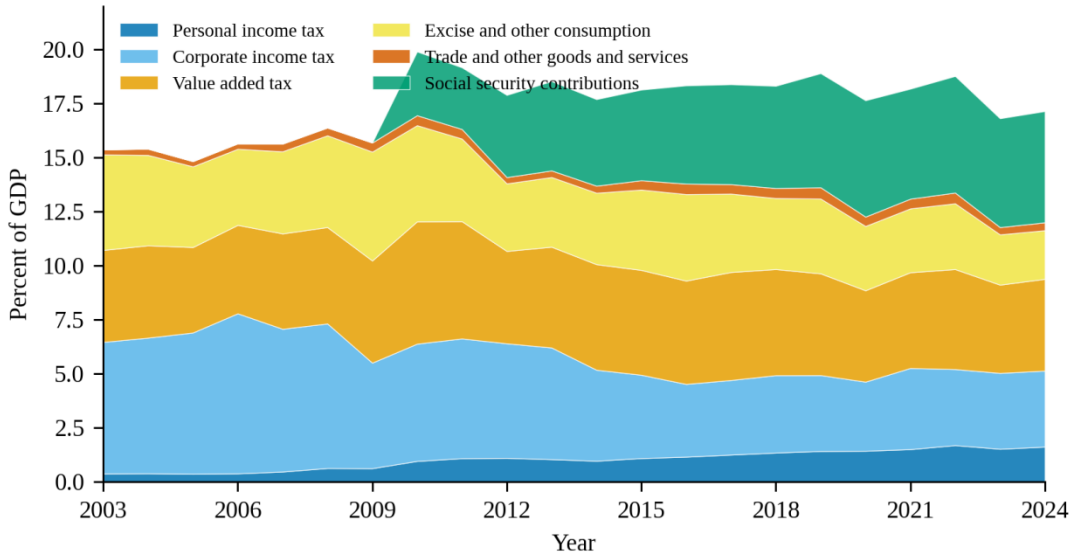


Fig. 1: Composition of Vietnamese tax revenue by category, percent of GDP, 2003 to 2024, general government, OECD Revenue Statistics classification [17]. Social security contributions are reported separately only from 2010, which accounts for the discontinuity in the uppermost band. Reproduced by Python Code du-lieu/gd6_01_hinh_ve.py from du-lieu/vietnam_afs_v4.csv

Source: created by the authors

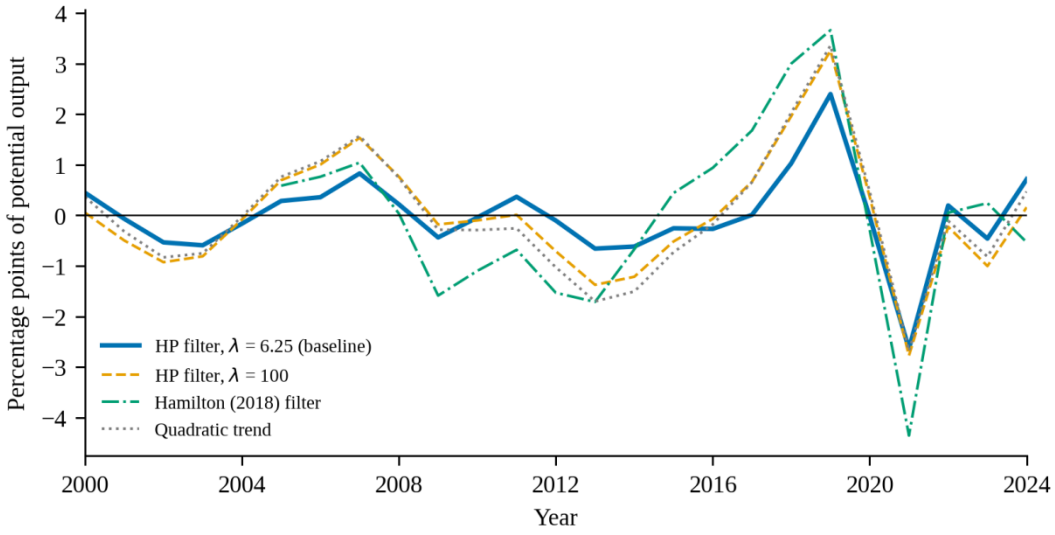


Fig. 2: Four estimates of the Vietnamese output gap, in percentage points of potential output, annual data 2000 to 2024. Real GDP from the World Bank World Development Indicators [23], extended with April 2026 World Economic Outlook forecasts [22] before filtering to limit end-of-sample bias. Reproduced by Python Code du-lieu/gd6_01_hinh_ve.py from du-lieu/vietnam_afs_v4.csv

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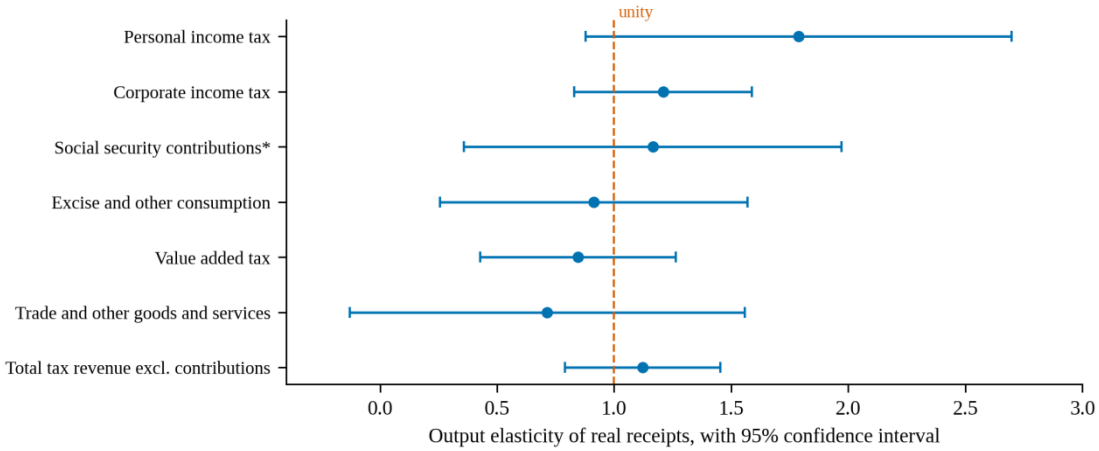


Fig. 3: Reform-adjusted output elasticities of Vietnamese revenue categories with 95 percent confidence intervals, 2003 to 2024 (social security contributions, marked with an asterisk, 2010 to 2024). The dashed line marks unity, the threshold above which a category raises the cyclical sensitivity of the balance ratio in equation (1). Reproduced by Python Code du-lieu/gd6_01_hinh_ve.py from du-lieu/gd3_bang_C3_donoi_cogian.csv
Source: created by the authors

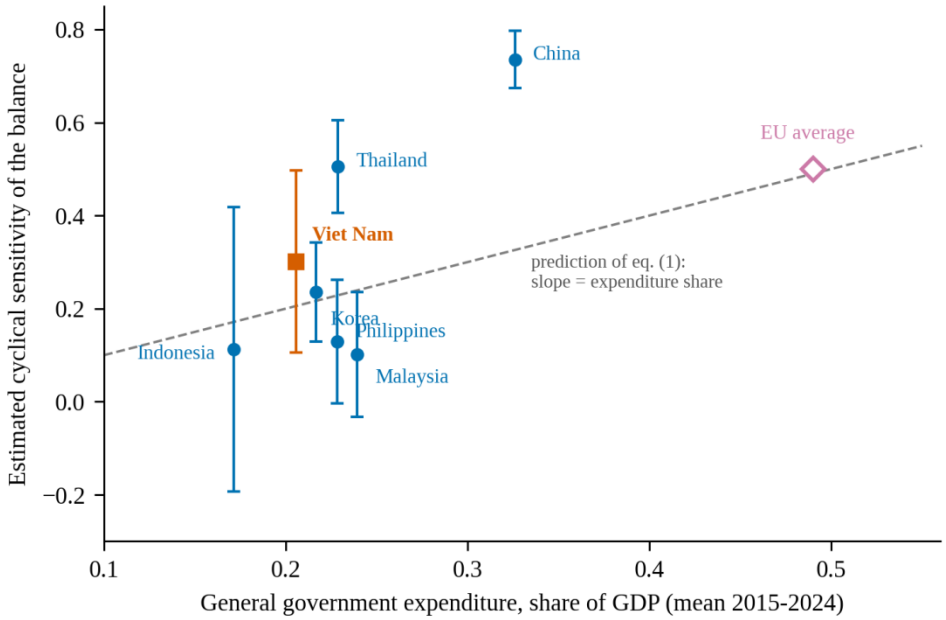


Fig. 4: The size of government and the cyclical sensitivity of the budget balance, seven Asia-Pacific economies, 2000 to 2024. Vertical bars are 95 percent confidence intervals from cluster standard errors on the country-specific slopes of the fully interacted panel specification with stimulus indicators (Appendix E, Table E3); the horizontal axis is total general government expenditure as a share of GDP, mean of 2015 to 2024, from the April 2026 Fiscal Monitor [27]. The dashed line is the prediction of equation (1) when the revenue-side and cyclical transfer terms are set to zero, so that the semi-elasticity equals the expenditure share. The open diamond marks the European Union average: expenditure at 49 percent of GDP [28] and a balanced semi-elasticity of 0.50 [14]. Reproduced by Python Code du-lieu/gd6_01_hinh_ve.py from du-lieu/gd5_bang_E5_doi_chieu_D5.csv
Source: created by the authors

Table 1. Descriptive statistics for the main Vietnamese fiscal and macroeconomic variables. Revenue categories follow the OECD Revenue Statistics classification, general government [17]; social security contributions are reported separately only from 2010, and total tax revenue excluding contributions uses the inclusive series for the years before 2010, when contributions were not reported separately. Output gap as defined in Section 4.3. Reproduced by Python Code du-lieu/gd6_01_hinh_ve.py.

Variable	Unit	Window	N	Mean	SD	Min	Max
Personal income tax	% of GDP	2003-2024	22	1.02	0.44	0.36	1.69
Corporate income tax	% of GDP	2003-2024	22	4.79	1.36	3.19	7.40
Value-added tax	% of GDP	2003-2024	22	4.59	0.43	3.95	5.66
Excise and other consumption taxes	% of GDP	2003-2024	22	3.57	0.68	2.25	5.04
Trade and other goods and services taxes	% of GDP	2003-2024	22	0.38	0.09	0.23	0.52
Social security contributions	% of GDP	2010-2024	15	4.48	0.82	2.85	5.40
Total tax revenue excluding contributions	% of GDP	2003-2024	22	14.39	1.45	11.81	17.01
Real GDP growth	% per year	2003-2024	22	6.11	1.37	2.52	8.19
Output gap, HP filter, $\lambda = 6.25$	% of potential	2003-2024	22	0.01	0.90	−2.64	2.40
Unemployment insurance benefits	% of GDP	2010-2024	15	0.15	0.13	0.02	0.56
State budget expenditure	% of GDP	2014-2024	11	20.63	1.51	18.20	22.45

Source: created by the authors

Table 2. Buoyancy and reform-adjusted elasticity of Vietnamese revenue categories, 2003 to 2024, annual data. Buoyancy is the raw response of real receipts to output; elasticity nets out legislated changes with the reform indicators listed in Appendix B. Each entry is the product of the response of receipts to the category base and of the base to output, estimated in first differences of logarithms; standard errors, in parentheses, are HAC with one lag, composed across the two steps by the delta method. Shares of GDP are sample means. Contribution equals the share times the elasticity minus one. Social security contributions, observable only from 2010, are excluded from ε_R; the residual is total tax revenue less the five listed categories, and Appendix C shows that varying its assumed elasticity from 0.5 to 1.5 moves ε_R by 0.0004. Sample windows of 2010-2024 and of 2003-2024 excluding 2020-21 are reported in Appendix C. Reproduced by Python Code du-lieu/gd3_03_donoi_cogian.py.

Category	Buoyancy (SE)	Elasticity (SE)	Share of GDP	Contribution to ε_R
Personal income tax	1.802 (0.472)	1.788 (0.464)	0.0102	+0.008
Corporate income tax	1.419 (0.247)	1.210 (0.194)	0.0479	+0.010
Value-added tax	0.831 (0.211)	0.846 (0.213)	0.0459	−0.007
Excise and other consumption taxes	0.907 (0.334)	0.914 (0.335)	0.0357	−0.003
Trade and other goods and services taxes	0.714 (0.430)	0.714 (0.430)	0.0038	−0.001
Residual revenue		1 (assumed)	0.0004	0.000
Total tax revenue excluding contributions	1.142 (0.165)	1.122 (0.169)	0.1439	+0.007
Memo: social security contributions, 2010-2024	1.160 (0.401)	1.166 (0.412)	0.0448	excluded

Source: created by the authors

Table 3. Semi-elasticity of the Vietnamese budget balance under alternative expenditure concepts, computed as $\varepsilon_B = \varepsilon_R + s_G - s_U \eta_U$ with the full-sample revenue estimate and the unemployment insurance elasticity of the post-break specification. The general government rows add the expenditure of the extrabudgetary funds and Vietnam Social Security, placed between 5.1 and 6.4 percent of output by the IMF staff tables documented in Appendix B. Intervals are from 100,000 simulation draws combining the bootstrap distribution of ε_R with the estimation error of the unemployment insurance elasticity; expenditure ratios are treated as measured. The ratio to the EU mean uses the unweighted average balance semi-elasticity of 0.50 across Member States [14]. The full grid of twelve variants, crossing three revenue windows with the alternative unemployment insurance specification, is reported in Appendix D. Reproduced by Python Code du-lieu/gd4_02_bandocogian_candoi.py.

Expenditure concept	s_G	ε_R	ε_B	95% interval	Ratio to EU mean of 0.50
State budget, 2025 vintage, mean 2021-2024	0.191	+0.007	0.197	[0.137, 0.258]	0.39
General government, lower bound	0.242	+0.007	0.248	[0.188, 0.309]	0.50
General government, midpoint	0.248	+0.007	0.255	[0.194, 0.315]	0.51
General government, upper bound	0.265	+0.007	0.272	[0.211, 0.332]	0.54

Source: created by the authors

Table 4. General government net lending as a percent of GDP regressed on the output gap, seven Asia-Pacific economies, 2000 to 2024. Balance from the April 2026 World Economic Outlook [22]; output gaps as in Section 4.3. Cluster standard errors use the t distribution with six degrees of freedom; the wild cluster bootstrap in [26] imposes the null with 9,999 Rademacher draws, random seed 20260813, and is the p-value the reader is asked to rely on with seven clusters. Newey-West standard errors, exact cluster p-values, and confidence intervals for every row are reported in Appendix E. Reproduced by Python Code du-lieu/gd5_03_panel_est.py.

Specification	Coefficient	SE cluster	SE Driscoll-Kraay	p, wild cluster	Within R^2	N
(1) Pooled OLS, no fixed effects	+0.522	0.086	0.136	0.014	0.144	175
(2) Country fixed effects	+0.509	0.085	0.111	0.014	0.144	175
(3) Adds stimulus indicators, 2009 and 2020-21	+0.246	0.097	0.095	0.026	0.244	175
(4) Adds year fixed effects	+0.269	0.130	0.107	0.038	0.435	175
(3) with HP filter, $\lambda = 100$	+0.246	0.084	0.081	0.046	0.274	175
(3) with Hamilton filter	+0.276	0.073	0.083	0.023	0.337	140
(3) with quadratic trend	+0.247	0.088	0.077	0.063	0.302	175
(3) without the forecast splice	+0.241	0.103	0.095	0.016	0.243	175

Source: created by the authors

Table 5. Decomposition of the difference between the Vietnamese and the average European balance semi-elasticity, on identical definitions. European entries for the two expenditure components are the published contributions for the EU28 treated as a single economy [14]; the revenue entry is the residual required to reproduce the Member State average of 0.50 and is consistent with the published statement that direct taxes contribute 0.10 with the remaining revenue categories negative. Vietnamese entries from Tables 2 and 3 at the general government midpoint. Shares of the gap do not sum to one hundred percent because the revenue term works in the opposite direction. Each counterfactual changes one term only. Reproduced by Python Code du-lieu/gd4_02_bandocogian_candoi.py.

Component	Vietnam	European Union	Difference	Share of the gap
Revenue-side semi-elasticity, ε_R	+0.007	−0.060	+0.067	−27.2%
Expenditure other than unemployment-related, s_G − s_U	+0.245	+0.460	−0.215	87.7%
Unemployment related expenditure, s_U (1 − η_U)	+0.003	+0.100	−0.097	39.6%
Balance semi-elasticity, ε_B	+0.255	+0.500	−0.245	
Counterfactual 1: EU size of non-unemployment expenditure only	+0.470	+0.500	−0.030	
Counterfactual 2: EU unemployment insurance system only	+0.352	+0.500	−0.148	
Counterfactual 3: both	+0.567	+0.500	+0.067	

Source: created by the authors