Two Economies in Puerto Rico: IP-Attributed Returns, Transfer Dependence, and Accounting Closure, 2002–2025

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Abstract

Puerto Rico exhibits a sharp divergence between territorial production and resident welfare. This paper documents and quantifies two interacting structural conditions over 2002–2025. First, non-resident primary-income outflows: multinational firms book large IP-attributed returns that elevate measured GDP ($129.4 billion in FY2025) while the associated property income accrues to non-resident owners, leaving gross national product at $87.6 billion—a $41.8 billion gap. Foreign direct investment (FDI) income debits of $43.2 billion exceed the measured FDI liability position of $35.2 billion, implying return rates difficult to reconcile with conventional real-capital explanations. Second, transfer dependence: resident income is insufficient to sustain household consumption without federal transfer payments that constitute about 40 percent of personal income (approximately $38.8 billion in FY 2025), and the household accounts imply persistent negative saving alongside a financing residual consistent with unmeasured flows or coverage and classification gaps. Using national accounts, balance-of-payments and international investment position tables, and trade and household-finance series, the paper reconciles production, income allocation, external balances, and household closure within a single integrated accounting system. Throughout, the shorthand labels "extraction" and "dependency" describe observed patterns of income incidence and ownership allocation; they do not imply fictitious output or intentional design by any actor.

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1 Introduction

Puerto Rico presents an unusually sharp divergence between territorial production and resident welfare. The island's official gross domestic product (GDP) is large—$129.4 billion in FY 2025 (July–June fiscal year)—and has grown in nominal terms; yet gross national product (GNP), the income accruing to residents, is only $87.6 billion, a $41.8 billion shortfall (32 percent of GDP). The capacity of the local labor market to sustain employment and the household balance implied by the national accounts point to persistent economic distress. This paper argues that the divergence is not a paradox of measurement but the arithmetic signature of two interacting macroeconomic systems operating on the same territory. The first is an *extraction economy*[1]: multinational firms book large intangible-asset (IP) returns in Puerto Rico's production accounts, elevating measured GDP while the corresponding property income is ultimately allocated to non-resident owners. The second is a *dependency economy*: the resident income base is structurally insufficient to sustain observed household consumption without large and persistent federal transfers, and even with these transfers the household sector exhibits chronic dissaving.

The non-resident appropriation mechanism is implied by the national accounting identity linking domestic and national aggregates. Gross national product (GNP)—the income earned by residents—equals GDP less primary incomes payable to the rest of the world (non-residents, including U.S. mainland owners) plus primary incomes receivable from abroad (see European Commission et al. (2009); see also Bureau of Economic Analysis (2024) for the domestic–national distinction in U.S. accounts). In economies where foreign-controlled corporations retain and remit large profits, GDP can be territorially correct yet welfare-misleading: the same accounting rules that allocate value added to the territory also allocate the associated profits to their ultimate owners through the allocation of primary income (see European Commission et al. (2009) and Lequiller and Blades (2014)). Global evidence shows that such wedges are a defining feature of profit-shifting regimes in which reported profitability becomes detached from local wages, employment, and the scale of the domestic economy (Clausing, 2016; Tørsløv et al., 2022; Damgaard et al., 2024). Puerto Rico represents an unusually pronounced instance of this pattern.

The 2017 Tax Cuts and Jobs Act (TCJA) altered U.S. multinational incentives regarding the location and reporting of intangible returns through the Global Intangible Low-Taxed Income (GILTI) framework, which applies a minimum-tax logic to foreign earnings above

[1]Throughout this paper, "extraction" and "dependency" are shorthand labels for observed patterns of income incidence and ownership allocation in the national accounts. They describe where recorded value added accrues, not whether the underlying production is real or whether any actor deliberately engineers the outcome.

a benchmark tied to tangible assets (Gravelle, 2024; Gravelle and Marples, 2025; Dobridge et al., 2025; Santacreu and Stewart, 2025). Because Puerto Rico–based subsidiaries are treated as controlled foreign corporations (CFCs) for U.S. tax purposes, GILTI applies directly to their reported earnings. These institutional changes create conditions under which one would expect the GDP–GNP wedge to widen after 2017 if a large share of Puerto Rico's recorded value added reflects mobile IP returns rather than returns to locally deployed tangible capital.

The dependency mechanism is visible not in production accounts but in the household sequence from income to consumption to saving. When disposable personal income is persistently below personal consumption expenditures and the implied dissaving is not matched by recorded borrowing, the accounts require a residual financing source. One possibility is sustained net liquidation of assets; another is statistical error. A third, consistent with the international national accounts literature, is that a portion of household economic activity is *non-observed* by standard data collection—a lower bound "non-observed economy floor" that enters the economy as consumption rather than recorded income (Alexander et al., 2021; Eurostat, 2021; OECD, 2002; Schneider and Enste, 2000). In this sense, the dependency economy is not merely a story about transfers: it is an accounting closure problem in which transfers bridge a large share of the gap between resident earned income and observed consumption, and the remainder must be reconciled through dissaving, hidden income flows, or both.

This paper quantifies the full system over FY 2002–2025 using three linked datasets: (i) Puerto Rico's official national accounts and household accounts from the Puerto Rico Planning Board's statistical releases (Junta de Planificación de Puerto Rico, 2014, 2022, 2025a, 2026), (ii) balance-of-payments (BoP) tables and the international investment position from the Planning Board's BoP releases, complemented by the accounting definitions in the System of National Accounts (Junta de Planificación de Puerto Rico, 2020a, 2023a, 2025b; European Commission et al., 2009; Bureau of Economic Analysis, 2024), and (iii) merchandise trade statistics that isolate the pharmaceutical and chemical channel (Junta de Planificación de Puerto Rico, 2020b, 2023b, 2025c). The empirical strategy is triangulation. I first document the GDP–GNP wedge and show that it is concentrated in manufacturing and accelerates after 2017, consistent with a profit-shifting mechanism. I then test a set of falsifiable implications that distinguish IP-attributed activity from plausible high-productivity real-capital returns: implausible implied returns on FDI positions, an income–stock inversion inconsistent with real investment, and industry and partner concentration in trade and income flows (Damgaard et al., 2024; Albori et al., 2024; Tørsløv et al., 2022). Finally, I map the non-resident appropriation pattern into the external accounts and show that the

apparent stability of Puerto Rico's current account depends mechanically on large secondary-income inflows, and that removing these transfers reveals a structural external deficit of a magnitude incompatible with self-sustaining resident consumption.

The contributions are threefold. First, I provide an integrated accounting of Puerto Rico's two macroeconomies that reconciles production, income allocation, external balances, and household finance within a single closed system grounded in the System of National Accounts (European Commission et al., 2009; van de Ven and Fano, 2017). Second, I operationalize a resident-relevant concept of production—a "resident-relevant gross product"—by stripping non-resident appropriated value added from territorial GDP in a manner consistent with the primary-income allocation implied by FDI accounting (European Commission et al., 2009; Lequiller and Blades, 2014). Third, I bound the scale of non-observed household activity using a transparent residual method and benchmark the resulting magnitudes against international evidence on informality (Alexander et al., 2021; Schneider et al., 2010). Taken together, these results show how Puerto Rico can simultaneously exhibit a large measured GDP, weak resident income growth, persistent labor market contraction, and stable aggregate demand sustained by external fiscal support.

The remainder of the paper proceeds as follows. Section 2 documents the GDP–GNP puzzle and derives testable predictions of an IP-driven profit-shifting mechanism. Section 3 states the accounting logic and identifying assumptions. Sections 4–6 triangulate the mechanism using BoP primary income, FDI income and positions, and trade statistics, and derive the external-account consequence. Section 7 formalizes the decomposition and defines resident-relevant production. Part II turns to the resident economy: Section 8 describes labor market constraints, Section 9 quantifies transfers as income, and Sections 10–11 establish and bound the household residual. Part III synthesizes the system and evaluates why major federal intervention episodes altered levels temporarily without changing the underlying structure.

Part I

The Production–Income Wedge: Non-Resident Profit Attribution and GDP

2 The GDP–GNP Puzzle

Puerto Rico's national accounts exhibit a persistent and widening wedge between measured territorial production and income accruing to residents. In the System of National Accounts, GDP is the balancing item of production within the territory, while GNP—equivalent to gross national income (GNI) in current SNA terminology—is the balancing item of primary income accruing to residents; the difference between the two is therefore mechanically generated by cross-border primary income flows (European Commission et al., 2009; Lequiller and Blades, 2014). In Puerto Rico, that wedge is large enough to reverse the usual interpretive logic that treats GDP growth as evidence of welfare improvement. The central empirical pattern documented in this paper is that Puerto Rico's GDP can rise while resident income remains flat, consistent with a sizeable share of recorded value added being allocated to non-resident owners and is ultimately recorded as primary income payable to the rest of the world.

Figure 1 documents the wedge from FY 2005 to FY 2025 using the Junta de Planificación statistical tables. Panel A plots GDP and GNP in current dollars and the implied gap, showing that the gap widens from $29.1 billion in 2005 to $34.4 billion by 2017 ($0.4 billion per year) and then accelerates to $41.8 billion by 2025 ($0.9 billion per year) (Junta de Planificación de Puerto Rico, 2014, 2022, 2025a). Panel B decomposes the divergence by sector and shows that it is concentrated in manufacturing, and in particular in the pharmaceutical and chemical subsector, which accounts for 89–94 percent of FDI income debits in the pre-TCJA period (2011–2016) and recovers to similar levels by 2024–2025, though the share dips to 71–89 percent during 2017–2022 as the composition of booked income shifts (computed from the BoP direct investment income by industry tables in Junta de Planificación de Puerto Rico 2020a, 2025b). This sectoral concentration matters: if the wedge reflected broad-based productivity differences, measurement error, or economy-wide cyclical effects, it would not appear primarily in a single, capital-intensive, IP-heavy industry. The puzzle can be stated in operational terms. If measured manufacturing output is rising and GDP is elevated, why does manufacturing employment fall and why does resident income stagnate?

Why does a production boom fail to appear in local wages and labor demand? The non-resident appropriation hypothesis answers these questions by treating GDP as territorially correct but distributionally misleading in an economy dominated by foreign-controlled firms whose reported profits are decoupled from local factor payments.

[Figure 1 about here.]

The post-2017 inflection is not an arbitrary break. The U.S. Tax Cuts and Jobs Act (TCJA) replaced key elements of the prior international tax regime and implemented a minimum tax on Global Intangible Low-Taxed Income (GILTI) designed explicitly around the distinction between a normal return to tangible assets and residual returns associated with intangibles (Gravelle, 2024; Gravelle and Marples, 2025). By construction, GILTI focuses on "supernormal" returns above a benchmark tied to tangible capital (QBAI), precisely the category of returns that is most easily shifted across jurisdictions when ownership of intellectual property can be reassigned within an MNE group (Gravelle, 2024; Santacreu and Stewart, 2025). If Puerto Rico's GDP–GNP wedge is driven by profit shifting rather than real-capital returns, the incentive environment created by TCJA yields a testable prediction: acceleration of the wedge after 2017, especially in IP-intensive sectors. This is not a causal TCJA estimate; it is consistent timing within a multi-dataset signature test that disciplines the profit-shifting interpretation without requiring a quasi-experimental design.

These considerations yield a set of falsifiable predictions that discipline the empirical analysis. First, the GDP–GNP wedge should be concentrated in manufacturing rather than broadly distributed across services, construction, or government. Second, the wedge should accelerate after 2017, consistent with the TCJA's altered treatment of intangible returns (Gravelle, 2024; Gravelle and Marples, 2025; Dobridge et al., 2025). Third, manufacturing output should rise without commensurate employment, reflecting a shift toward booked profits rather than expanded local production capacity, consistent with evidence that real decisions (employment, investment) are less responsive to tax than accounting decisions (Clausing, 2016). Fourth, the same wedge should be simultaneously visible in three independent statistical systems: national accounts (GDP vs. GNP), the balance of payments (net primary income outflows), and external trade (an anomalous pharma surplus and partner concentration). The remainder of Part I evaluates these predictions and shows that a single mechanism matches all three data signatures.

3 Identification and Accounting Logic

This section makes the identifying assumptions explicit so that the triangulation in Sections 4–6 can be evaluated against them. The starting point is the national accounting identity linking domestic and national aggregates. Let primary income denote the sum of compensation of employees and property income (including distributed and reinvested earnings) between residents and non-residents. Then, by definition, GNP equals GDP less primary incomes payable to non-residents plus primary incomes receivable from non-residents (European Commission et al., 2009; Lequiller and Blades, 2014). In the SNA, reinvested earnings on direct investment are treated as if they were distributed to the foreign direct investor and then reinvested, so large retained profits of foreign-controlled affiliates generate primary income outflows even absent cash dividends (European Commission et al., 2009; van de Ven and Fano, 2017). This accounting treatment is not a model assumption; it is definitional. Puerto Rico's official social-accounts methodology adopts these definitions and organizes the system around an explicit resident/non-resident split in income flows (Junta de Planificación de Puerto Rico, 2018).

The observed GDP–GNP gap is therefore equivalent to a net primary income debit (up to statistical discrepancy and classification differences). The paper's claim is that the bulk of this debit reflects a specific mechanism: IP-attributed value added booked within Puerto Rico's production account and allocated to non-resident owners through primary income outflows. This mechanism corresponds to the broader international literature on pass-through investment and profit shifting, where profits recorded in low-tax jurisdictions become detached from local wages, employment, and tangible capital (Damgaard et al., 2024; Tørsløv et al., 2022; Albori et al., 2024). It also accords with transfer pricing guidance emphasizing that legal ownership of intangibles need not align with value creation functions, and that pricing unique intangibles is inherently difficult due to the lack of reliable comparables (OECD, 2014, 2022).

The identification strategy is a joint-signature test rather than a single-indicator inference. If the wedge is driven by tax-motivated profit shifting rather than normal returns to locally deployed tangible capital, three conditions should hold jointly. (P1) Implied returns on measured FDI positions should be implausibly high under any reasonable capital-productivity model, far above normal benchmarks documented for FDI returns. (P2) FDI income should rise while measured FDI stock falls, an income–stock inversion inconsistent with real-capital accumulation and depreciation dynamics. (P3) The wedge should be traceable to a narrow set of industries and counterpart jurisdictions consistent with IP holding and intra-group arrangements, rather than to diversified trading partners characteristic of

real export-led production. Any alternative explanation must match all three simultaneously. Sections 4–6 evaluate each condition using independent data sources.

4 Evidence: FDI Returns Exceed Plausible Benchmarks

I begin with the primary income channel. The balance of payments records the allocation of primary income between Puerto Rico and the rest of the world; in the SNA architecture, this is the account where the GDP–GNP divergence must appear (European Commission et al., 2009; van de Ven and Fano, 2017). Figure 2 presents a three-panel triangulation of FDI income, FDI positions, and implied returns using the Junta de Planificación balance of payments and international investment position tables (Junta de Planificación de Puerto Rico, 2020a, 2023a, 2025b). Across three published BoP vintages (2020, 2023, and 2025), the same pattern holds: FDI income debits rise from $32.9 billion in 2011 to $43.2 billion in 2025, while the measured FDI liability position declines from a 2019 peak of $103.7 billion to just $35.2 billion by 2025. The implied return rate—FDI income divided by measured FDI stock—rises from 41 percent in 2011 to 123 percent in 2025, far above any plausible real-capital benchmark.

[Figure 2 about here.]

The logic is simple. Let Y^{FDI} denote direct investment income payable to non-residents and let K^{FDI} denote the corresponding direct investment position (book value). The implied return rate is $r^{imp} = Y^{FDI}/K^{FDI}$. If direct investment income primarily reflected returns to productive tangible capital, r^{imp} should lie in a range comparable to normal FDI returns, and movements in Y^{FDI} should co-move with movements in K^{FDI} over time. Instead, Puerto Rico displays what the global FDI literature identifies as a hallmark of intangible-holding and pass-through structures: recorded profits can substantially exceed plausible returns to local tangible capital when activity involves IP ownership arrangements, even though the capacity to absorb real investment is limited (Damgaard et al., 2024; Albori et al., 2024). The resulting income can be booked in the host jurisdiction's accounts without commensurate local employment, wages, or capital deepening, consistent with evidence that reported profitability in such jurisdictions can reach multiples of local labor compensation (Tørsløv et al., 2022; Clausing, 2016).

The inference is not sensitive to plausible measurement adjustments. Even multiplying the measured FDI position by a factor of two or three—well beyond any reasonable undermeasurement—would still leave implied returns far above normal FDI benchmarks; lagging positions by one or two years to accommodate deployment timing shifts the ratio

only modestly. The discrepancy is orders of magnitude, not a borderline case: it is more consistent with an IP profit-shifting mechanism than with any real-capital explanation.

5 Trade Corroboration and Counterparty Concentration

The non-resident appropriation pattern implied by the primary income account should also be visible in external trade if the wedge is driven by a specific industry and a narrow set of counterpart jurisdictions associated with IP holding and intra-group supply chains. Figure 3 provides this corroboration using the Junta de Planificación merchandise trade statistics that isolate the pharmaceutical and chemical channel (Junta de Planificación de Puerto Rico, 2020b, 2023b, 2025c). The central empirical relationship is that the net pharmaceutical surplus co-moves with the GDP–GNP wedge through the pre-TCJA period; the two series diverge somewhat after 2017 as the composition of booked income shifts, but the pharmaceutical channel remains the dominant single-sector contributor. This is consistent with the interpretation that the same sector associated with elevated territorial production is the sector through which external imbalances manifest (Junta de Planificación de Puerto Rico, 2014, 2022, 2025a, 2020b, 2023b, 2025c).

[Figure 3 about here.]

This pattern matches international evidence on profit shifting and IP-attributed production. When transfer prices and intangible ownership structures reallocate profits across jurisdictions, they mechanically reallocate measured value added and trade balances as well (European Commission et al., 2009; Lequiller and Blades, 2014; Tørsløv et al., 2022). The OECD transfer pricing framework emphasizes that unique intangibles often lack reliable comparables and that contractual allocations of intangible ownership may diverge from the locus of value-creating functions (OECD, 2014, 2022). In such settings, the geographical distribution of recorded profits and the direction of associated service and royalty flows can become concentrated in a small set of favorable jurisdictions. Evidence from global FDI networks similarly shows that pass-through positions and structures lead to bilateral linkages unrelated to the size of the local economy (Damgaard et al., 2024; Albori et al., 2024). The Puerto Rico pattern fits this description: concentration by industry and counterpart is expected under profit shifting and unlikely under a broad-based export expansion.

6 The External Account Consequence

A central implication of large non-resident profit outflows is that they alter the interpretation of Puerto Rico's external balance. The current account is often used as a diagnostic of sustainability: persistent deficits can signal excessive external borrowing, while balance or surplus can appear reassuring. In an economy with large non-resident profit outflows, however, apparent balance can be an artifact of offsetting flows. Figure 4 shows that Puerto Rico's current account appears near balance in aggregate, but this surface stability masks a structural deficit that emerges once secondary income inflows are removed (Junta de Planificación de Puerto Rico, 2020a, 2023a, 2025b).

[Figure 4 about here.]

The counterfactual is purely accounting-based. In the balance of payments identity, the current account equals the trade balance plus the primary income balance plus net secondary income. Secondary income includes current transfers such as social benefits and other federal transfers recorded as credits. Removing this component yields a structural current account measure that answers a specific question: what would the external balance be absent transfers? Because this is constructed by deleting an observed line item rather than simulating behavior, it is not model-dependent. The result is that the structural balance becomes sharply negative——−$16.2 billion in 2011, widening to −$50.4 billion by 2025—reflecting the fact that non-resident profit appropriation generates large net primary income debits while the resident economy lacks an export base sufficient to offset them. In this sense, the external accounts already imply a structural dependence on transfers: stability requires continuous external fiscal inflows.

This logic connects directly to the broader framework of integrated non-financial and financial accounts. In the SNA sequence, net lending/borrowing of the domestic economy must have a counterpart of equal magnitude and opposite sign in the rest-of-world account (van de Ven and Fano, 2017; European Commission et al., 2009). When the resident sector cannot generate sufficient saving to finance domestic absorption and primary income outflows, external transfers and financial flows must reconcile the difference. Section 9 returns to this closure from the household side; here the point is that the current account balance, taken at face value, can conceal the dependence on transfers that makes the system internally coherent.

7 Formal Decomposition and Resident-Relevant Production

The preceding sections establish that Puerto Rico's GDP–GNP wedge is not a statistical curiosity but the measurable imprint of a specific allocation mechanism: a large share of recorded value added accrues to non-resident owners and is recorded as primary income payable abroad. This section formalizes the implication for welfare-relevant production. The key distinction is between territorial production (GDP) and the subset of production that plausibly supports resident factor incomes and domestic demand. International guidance emphasizes that GDP is a production measure and that national income and consumption measures are often better proxies for welfare in economies with large cross-border income flows (European Commission et al., 2009; Lequiller and Blades, 2014). In the presence of large profit shifting, global evidence also shows the need to adjust standard statistics to separate resident-relevant from non-resident-attributed activity (Damgaard et al., 2024; Tørsløv et al., 2022).

I therefore define a resident-relevant gross product (RRGP) as GDP net of non-resident appropriated value added, VA_{NR}, where VA_{NR} denotes value added accruing to non-resident owners with minimal local factor payments or retained earnings available to residents. RRGP is a constructed welfare-relevant production proxy, not a new SNA aggregate; its purpose is to approximate the portion of territorial output that plausibly sustains resident factor incomes. Operationally, VA_{NR} is bounded below by the portion of primary income outflows in excess of any plausible normal return on measured FDI positions. Using a conservative benchmark return rate for normal capital income provides a lower bound on the non-resident-appropriated component; alternative benchmarks shift the bound only modestly because the observed magnitudes are large. Figure 5 presents the decomposition. The central result is that once non-resident appropriated value added is stripped from the production account and the corresponding primary income outflows are stripped from the allocation of income account, the implied gap between resident-relevant production and resident income collapses. In this sense, the accounts are internally consistent: the same mechanism that elevates measured GDP also generates primary income debits, and removing the non-resident component from both sides leaves GNP largely unchanged, consistent with the definitional treatment of reinvested earnings and foreign-controlled enterprise saving in the SNA (European Commission et al., 2009; van de Ven and Fano, 2017).

[Figure 5 about here.]

The key message is interpretive rather than accusatory. GDP is not "wrong"; it measures

territorial production as defined. The problem arises when GDP is treated as a proxy for resident welfare in an economy where a large fraction of measured value added is appropriated abroad through the primary income account. This distinction motivates Part II, which turns from territorial production to the resident economy and asks what the remaining productive base can sustain, how transfers enter as income, and what the household accounts imply about hidden activity and dissaving.

Part II

The Dependency Economy: Transfers, Dissaving, and the Household Residual

8 The Labor Market Reality

If Part I establishes that a large share of Puerto Rico's measured GDP is non-resident appropriated, the next question is what the remaining resident-relevant economy can sustain. The labor market provides the most direct evidence on this constraint because employment and wages reflect realized factor use rather than booked profits. Puerto Rico's labor market has not recovered to its mid-2000s levels. Total nonfarm employment averaged 958,000 in FY 2025 compared with 1,052,000 in FY 2006, a loss of 94,000 jobs (−9 percent); manufacturing employment fell from 113,000 to 84,000 (−26 percent) over the same period. The labor force itself contracted by 179,000 persons (−13 percent), driving the participation rate from 48.6 to 44.8 percent and masking the employment shortfall behind a lower unemployment rate (PRPB *Indicadores Económicos*, seasonally adjusted FY averages; Junta de Planificación de Puerto Rico 2026). The adjustment has been characterized by persistent non-employment, reduced participation, and weak wage growth. These outcomes are consistent with a production structure in which the high-value-added components of manufacturing are not locally labor intensive and in which the contraction of the high-wage manufacturing base left a predominantly low-wage service economy. More generally, the labor market pattern aligns with the established hierarchy in multinational responses to tax regimes: accounting allocations of profits can be highly responsive to tax incentives even when real decisions about employment and investment are not (Clausing, 2016).

The historical context reinforces this interpretation. The phase-out and repeal of IRS Section 936 removed a large, targeted subsidy to capital-intensive multinationals, especially in pharmaceuticals, and is associated with a decline in manufacturing establishments and wages relative to comparable U.S. states (Feliciano and Green, 2019). In the longer-run legal history, the post-936 regime is characterized by corporate restructuring that preserved preferential tax positions through controlled foreign corporation arrangements and other mechanisms that sustain large recorded profits without a commensurate local employment base (Dick, 2015; President's Task Force on Puerto Rico's Status, 2011). Against this background, Figure 6 summarizes the labor-market constraint that conditions the remainder of Part II: the resident economy operates with a diminished employment base, and the wage bill implied by that base is too small to sustain observed consumption without external income sources.

[Figure 6 about here.]

9 When Transfers Become Income

The second defining feature of Puerto Rico's resident economy is the scale of federal transfers. In the SNA sequence of accounts, transfers enter the redistribution of income account and flow into disposable income, thereby supporting household consumption without being generated by local production (European Commission et al., 2009; Lequiller and Blades, 2014). Figure 7 shows that transfer payments to individuals—the PRPB category that includes Social Security, Medicare, nutritional assistance, and other federal cash and in-kind benefits (Appendix Table 21 in Junta de Planificación de Puerto Rico 2025a)—have risen from $9.7 billion in FY 2005 (19 percent of personal income) to $38.8 billion in FY 2025 (40 percent of personal income; preliminary), shifting from a supplementary component of household resources to a structural pillar of personal income. The transfer share increases steadily over time, with large temporary spikes associated with major federal intervention episodes (U.S. Government Accountability Office, 2021; Webster et al., 2020), but the underlying trend is upward even outside emergency years.

[Figure 7 about here.]

This pattern has an accounting implication. When transfers constitute a large fraction of personal income, the observed level of household consumption becomes less informative about the productive capacity of the resident economy and more informative about the scale of external redistribution. The external accounts in Part I already show the macro counterpart:

secondary income inflows are the line item that prevents Puerto Rico's current account from revealing a structural deficit. Here, the same fact is expressed from the household side: transfers are not a cyclical supplement but a permanent bridge between earned income generated by the resident-relevant economy and the level of consumption observed in the household accounts.

Transfers also interact with labor-market behavior. The shadow-economy literature emphasizes that generous transfers can create strong marginal disincentives for formal labor market participation when benefits are withdrawn rapidly with earned income, potentially increasing the attractiveness of informal work (Schneider and Enste, 2000). This does not imply that transfers are undesirable; it implies that in an economy with limited formal job opportunities and low wages, transfer dependence and informality can become jointly reinforcing features of household survival strategies, consistent with international guidance that household production and informal activity can substitute for formal income in sustaining consumption (Alexander et al., 2021; Eurostat, 2021).

10 The Household Paradox

The central empirical anomaly on the resident side is that even after accounting for transfers, Puerto Rico's household accounts imply chronic dissaving. In the SNA, household saving is the balancing item between disposable income and final consumption expenditures; persistent negative saving indicates that households are financing consumption by running down assets, increasing liabilities, receiving unrecorded income, or some combination of these (European Commission et al., 2009; van de Ven and Fano, 2017). Figure 8 documents three nested observations. First, transfers are the dominant source of growth in household resources. Second, the household saving rate is chronically negative—disposable personal income fell short of consumption by \$3.6 billion (−5.6 percent) in FY 2019 and by \$7.6 billion (−8.1 percent) in FY 2025 (PCE \$101.8B − DPI \$94.2B; preliminary)—outside a small number of emergency infusion years. Third, in recent years the \$7.6 billion of dissaving implied by the FY 2025 income–consumption gap is not matched in the available consumer-credit series: net new consumer debt (total consumer debt stock, PRPB Appendix Table 17 in Junta de Planificación de Puerto Rico 2025a) that year was just \$43 million, implying a financing gap of approximately \$7.6 billion that requires a residual source.

[Figure 8 about here.]

This is an accounting closure problem, not a behavioral claim. Let DPI denote disposable personal income and PCE denote personal consumption expenditures. Official saving

is $S = DPI - PCE$. When $S < 0$ and net new borrowing is small, the accounts require a residual source: asset drawdown, unrecorded income, or measurement and coverage gaps in the income series. Persistent residuals of this magnitude would imply systematic mismeasurement rather than transitory noise (OECD, 2002). The remainder of this paper treats the residual as informative: the published accounts, while internally coherent, do not fully observe the income sources that support consumption.

11 The Non-Observed Economy Floor

I bound the scale of non-observed household activity by exploiting the residual between dissaving and recorded borrowing. The logic follows internationally recognized indirect approaches to measuring the informal or non-observed economy, which treat discrepancies between independently measured income and expenditure aggregates as indicators of unrecorded activity (Alexander et al., 2021; Eurostat, 2021; Schneider and Enste, 2000). Official guidance explicitly recognizes discrepancy methods as macroeconomic tools for estimating informal-sector activity and distinguishes such production from illegal or purely underground activity (Eurostat, 2021; OECD, 2002). The goal here is not to recover a complete estimate of informality, but to construct a transparent lower bound on the unobserved income (or in-kind production) required to reconcile observed consumption with recorded income and borrowing.

Operationally, define the annual household financing gap as

$$G_t \equiv \max\{0,\, (PCE_t - DPI_t) - \Delta Debt_t\},$$

where $\Delta Debt_t$ denotes net new consumer borrowing measured as the annual change in total consumer debt stock (PRPB Appendix Table 17 in Junta de Planificación de Puerto Rico 2025a). This series covers bank-intermediated consumer credit; it excludes mortgages, student debt, trade credit, and informal lending, so G_t is a lower bound on unexplained financing given the included debt categories. The floor is further conservative because it sets $G_t = 0$ in positive-saving years where informal income may still exist, and it does not account for simultaneous asset accumulation—commercial bank deposits grew by approximately \$10.8 billion over FY 2016–2025 despite chronically negative saving rates.[2] This observation provides a diagnostic: if the financing residual were dominated by asset liq-

[2]Computed from PRPB Appendix Table 16 (Personal Financial Assets) in Junta de Planificación de Puerto Rico 2025a: deposits in commercial banks rose from \$21.4 billion in FY 2016 to \$32.3 billion in FY 2025 (preliminary). Part of the deposit growth could reflect portfolio reallocation rather than net new saving, but the magnitude is nonetheless difficult to reconcile with the recorded income–consumption gap.

uidation, household financial balances should contract broadly; instead, the deposit series shows simultaneous accumulation, which is more consistent with unobserved income inflows than with net drawdown of wealth. Figure 9 reports G_t over time and presents diagnostic checks against the measurement-error critique. The scale is economically meaningful relative to disposable income, the persistence is inconsistent with a zero-mean noise process, and the pattern aligns with periods in which formal labor market opportunities were weak and household support relied more heavily on transfers and informal activity. International benchmarks further imply that a residual on the order of a few percent of income is not prima facie implausible; if anything, it represents a conservative floor relative to shadow-economy estimates in comparable settings (Schneider et al., 2010).

[Figure 9 about here.]

Two caveats are important. First, the residual method does not distinguish among types of non-observed activity: it may reflect informal market work, underreported earnings, remittances not captured in measured income, or household production for own use that substitutes for market purchases, all of which fall within the broader non-observed economy taxonomy (OECD, 2002; Alexander et al., 2021). Second, the method does not claim that the entire gap is informality; it claims only that the published accounts require a residual financing source that is not explained by recorded borrowing, and that international statistical guidance treats such discrepancies as legitimate signals of non-observed activity when they are large and persistent. With these caveats, the non-observed economy floor provides the missing piece needed to close the resident-side arithmetic in Part III: after stripping non-resident-appropriated production from GDP, resident earned income remains insufficient to sustain consumption, and the resulting gap is bridged by a combination of federal transfers, dissaving, and non-observed resources.

Part III

Synthesis: The Arithmetic of Structural Equilibrium

12 The Closed System

Parts I and II establish two facts that, taken separately, can appear contradictory. On the one hand, Puerto Rico records a large GDP driven by a highly productive manufacturing sector.

On the other hand, the resident economy exhibits weak labor market outcomes, high transfer dependence, and household accounts that imply persistent dissaving and a residual financing gap. The purpose of this section is to show that these facts are not inconsistent—they are reconciled by a single closed accounting system that links (i) production and national income, (ii) the external balance, and (iii) household finance. They are the mechanical consequences of a system in which (a) a large share of recorded production is appropriated by non-resident owners through the primary income account and (b) the remaining resident income base is insufficient to finance observed domestic absorption without large external transfers and non-observed resources. In FY 2025, the magnitudes are stark: the GDP–GNP gap reaches \$41.8 billion, FDI income debits of \$43.2 billion exceed the entire measured FDI stock of \$35.2 billion, the structural current account deficit is −\$50.4 billion, transfer payments to individuals of \$38.8 billion constitute 40 percent of personal income, and the DPI shortfall relative to PCE totals \$7.6 billion.[3]

The closure can be stated as a sequence of linked identities. GDP is the value of production within the territory, regardless of ownership, while GNP is the income accruing to residents and differs from GDP only through net primary income flows with the rest of the world (European Commission et al., 2009; Lequiller and Blades, 2014). Part I shows that the GDP–GNP wedge in Puerto Rico reflects a non-resident appropriated component of value added that is recorded as primary income payable abroad, consistent with the treatment of reinvested earnings on foreign direct investment (European Commission et al., 2009; van de Ven and Fano, 2017). Subtracting this component yields a resident-relevant production measure that moves substantially closer to resident income because the same adjustment applies on both the production side and the allocation of income side (the remaining gap reflects statistical discrepancy and other primary income components).

From the resident side, disposable income is obtained by adding transfers and subtracting current taxes from primary incomes (European Commission et al., 2009). Household consumption is then financed by disposable income, net borrowing, net asset drawdowns, and any non-observed resources. The household paradox documented in Part II implies that disposable income plus recorded borrowing is insufficient to finance observed consumption in many years. The non-observed economy floor provides a transparent lower bound on the non-observed component required for closure, while residual dissaving captures the portion financed by other means (including asset liquidation). The result is a full reconciliation: the resident economy's observed standard of living is sustained not by the resident-relevant productive base alone, but by a portfolio of external redistribution and non-observed resources

[3]National-accounts aggregates (GDP, GNP, personal income, consumption) are on the PRPB fiscal-year basis (July–June); BoP and IIP figures follow the BoP reporting calendar. FY 2025 values are preliminary.

that compensates for the narrowness of the local wage base.

The same closure appears in the external accounts. In an integrated SNA system, the net lending/borrowing of the domestic economy is equal to the net lending/borrowing of the rest of the world with the opposite sign (van de Ven and Fano, 2017; European Commission et al., 2009). Puerto Rico's primary income debits generated by non-resident profit appropriation must therefore be matched by some combination of trade surpluses, secondary income inflows, and financial flows. Part I shows that once secondary income is removed, the current account becomes structurally negative, implying that the observed stability of the external balance depends on continuous transfers. Part II shows the household counterpart: the same transfers that stabilize the current account are what enter disposable income and support consumption. In this sense, the system constitutes a structural equilibrium in the narrow accounting sense—identities balance each year—not a welfare optimum: stability is achieved by external fiscal flows that reconcile an internal imbalance rather than by endogenous adjustment of the resident productive base.

Two interpretive points follow. First, Puerto Rico's macroeconomic condition cannot be inferred from GDP alone. GDP correctly measures territorial production, but in an economy with a large non-resident appropriated component it is not a welfare proxy, a point emphasized in both the SNA and the broader "beyond GDP" national accounts literature (European Commission et al., 2009; Lequiller and Blades, 2014). Second, the resident economy's dependence is not an episodic outcome of shocks; it is a structural feature of the post-2006 regime in which tax architectures and corporate structures sustain large booked profits while the local labor market and wage base remain constrained (Feliciano and Green, 2019; Dick, 2015; President's Task Force on Puerto Rico's Status, 2011). The structural-equilibrium characterization is therefore precise: the system can persist without collapse because the accounting closure is achieved annually, but it is not self-sustaining because closure requires large external inflows.

13 What Three Interventions Did Not Fix

Puerto Rico experienced three major federal intervention episodes during the sample period: the American Recovery and Reinvestment Act (ARRA, post-2009), the post-Hurricane Maria disaster response (post-2017), and the American Rescue Plan (ARP) era (post-2021). Each episode injected large temporary resources that raised measured incomes and supported consumption. In the national accounts, ARRA and ARP appear primarily as increases in secondary income (transfer payments to individuals); the Maria response appears in both secondary income and capital-account disaster grants (U.S. Government Accountability Of-

fice, 2021; Webster et al., 2020). In the household accounts, all three episodes register as temporary improvements in saving relative to the chronically negative baseline. Yet none of the episodes altered the structural conditions documented in Parts I and II. The non-resident appropriation pattern persisted because the institutional structure governing intangible returns and transfer pricing remained intact, and in the post-2017 period the U.S. international tax regime continued to apply differential treatment to intangible-related returns, leaving the incentives for profit shifting largely in place (Gravelle, 2024; Gravelle and Marples, 2025; Santacreu and Stewart, 2025). The dependency mechanism persisted because the resident labor market did not regain a high-wage manufacturing base at scale and because the transfer share of personal income remained high even outside the spikes.

The point is not that interventions were ineffective at their proximate goals. Rather, they primarily operated through level effects: they raised disposable income and stabilized aggregate demand temporarily. The accounting evidence indicates that they did not break the invariances that define the two-economy system: the GDP–GNP wedge remained large, primary income debits remained substantial, and the household sector returned to dissaving once emergency inflows receded. In the language of this paper's framework, interventions sustained the system without transforming it (U.S. Government Accountability Office, 2021).

14 Conclusion

This paper documents and quantifies Puerto Rico's two macroeconomies over FY 2002–2025. The first is a non-resident appropriation pattern in which a large share of recorded territorial production is allocated to non-resident owners through the primary income account, producing a persistent GDP–GNP wedge visible simultaneously in the national accounts, the balance of payments, and trade statistics. The second is a dependency economy in which resident earned income is insufficient to sustain observed consumption without large federal transfers, and in which household accounts imply persistent dissaving and a non-observed financing residual. These two economies are not independent: the same fiscal and corporate architecture that makes Puerto Rico attractive for booking intangible returns elevates measured GDP without proportionately expanding the resident wage base, and the resulting gap is bridged through redistribution.

Two implications follow for research and policy. Statistically, Puerto Rico illustrates the limits of relying on GDP as a welfare metric in highly globalized, profit-shifting environments. The SNA itself emphasizes that national income and consumption measures often better track welfare when cross-border income flows are large (European Commission et al., 2009; Lequiller and Blades, 2014). In such cases, decompositions that separate resident-relevant

production from non-resident appropriated value added become essential for interpretation. Substantively, Puerto Rico's apparent macro stability is achieved through continuous external fiscal support. Treating GDP growth as the primary objective risks optimizing for a metric dominated by non-resident-appropriated components, potentially worsening the dependency condition if it does not expand resident factor incomes and employment.

The broader lesson is that transfer-sustained equilibria can be stable in accounting terms while remaining structurally fragile. Puerto Rico's accounts close each year because transfers, financial flows, and non-observed resources reconcile a system in which territorial production and resident welfare are decoupled. Recognizing and measuring that decoupling is a prerequisite for any policy evaluation that aims to improve resident living standards rather than merely raise reported GDP.

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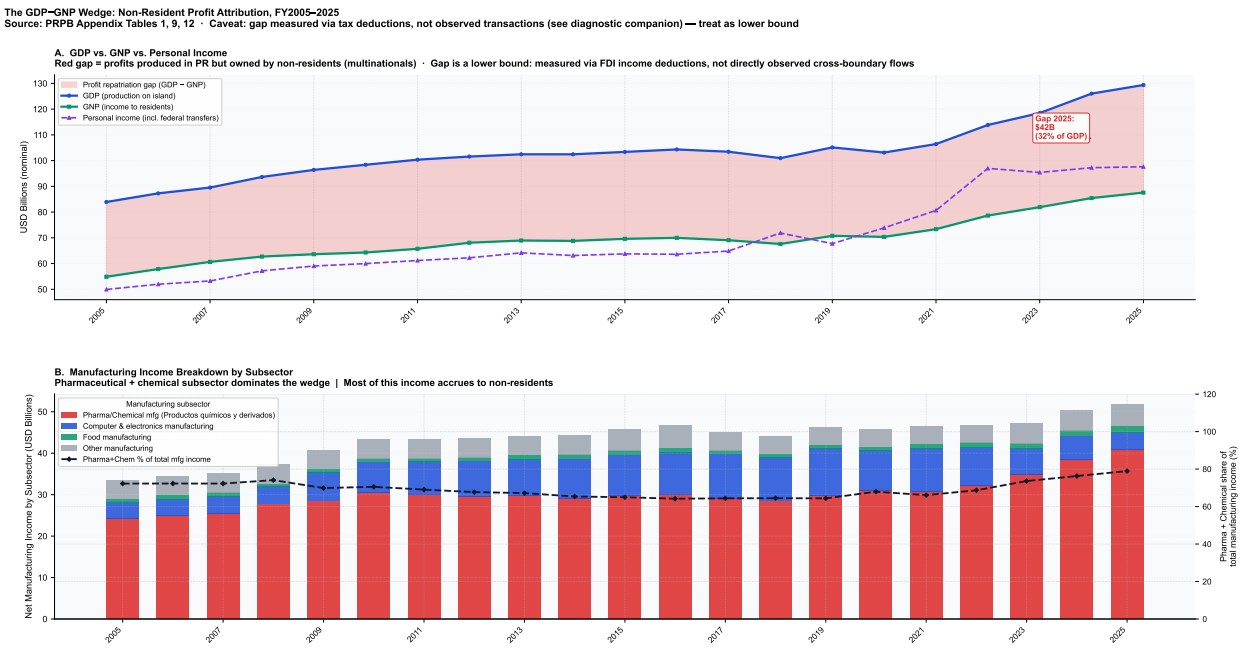

Figure 1: The GDP–GNP wedge, FY 2005–2025. Current USD billions, fiscal-year basis (July–June). Panel A: GDP, GNP, and personal income; shaded area marks the post-2017 period. Panel B: manufacturing income by subsector, with pharmaceutical/chemical share on right axis. Source: PRPB statistical appendix, Tables 1, 9, and 12 (Junta de Planificación de Puerto Rico, 2025a).

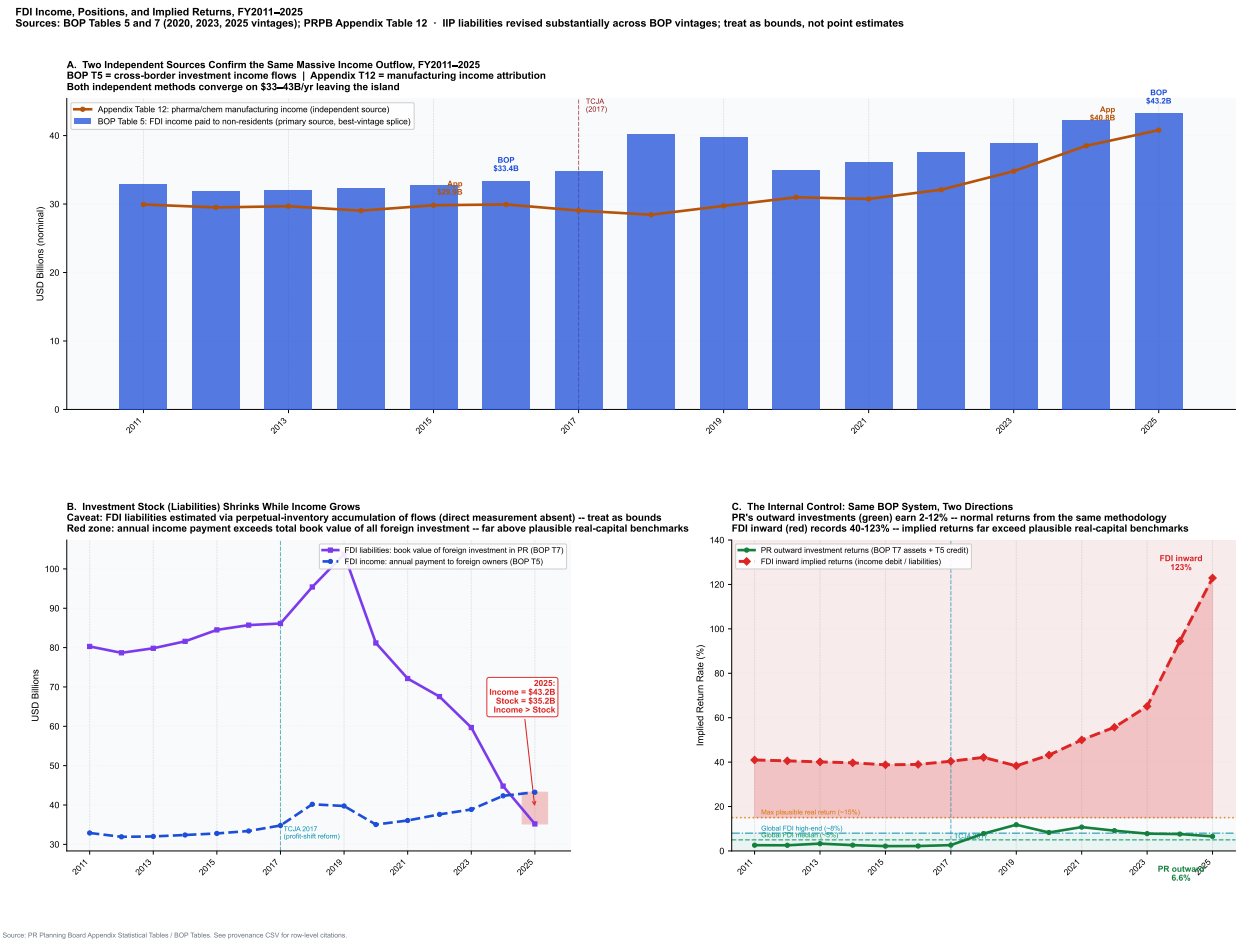

Figure 2: FDI income, positions, and implied returns, FY 2011–2025. Panel A: FDI income debits (current USD billions). Panel B: FDI liability position (end-of-period book value, current USD billions); note the income–stock inversion after 2019. Panel C: implied return rate (FDI income ÷ FDI position). Source: PRPB BoP and IIP tables (Junta de Planificación de Puerto Rico, 2025b).

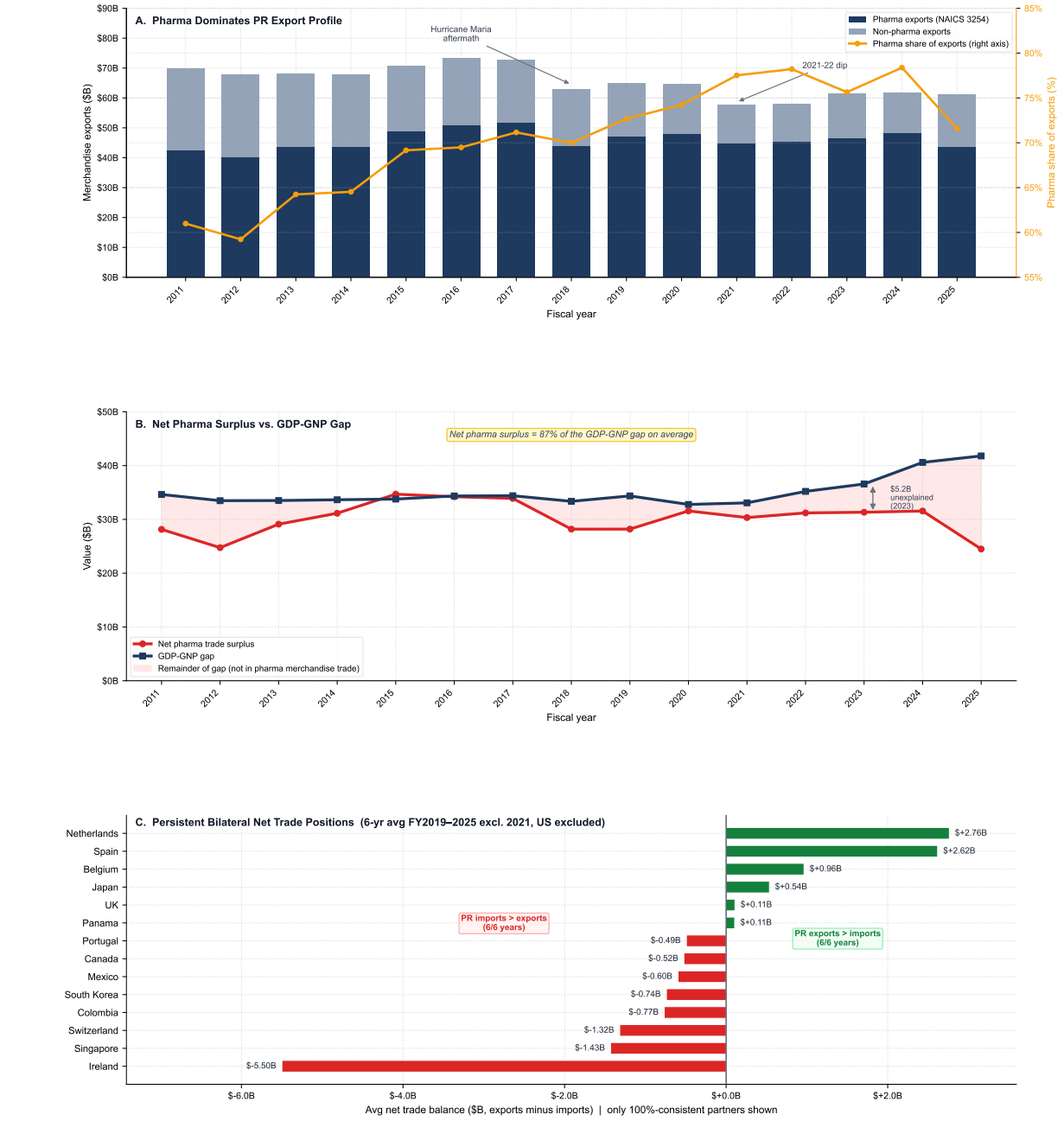

Figure 3: Trade–gap nexus: pharmaceutical surplus and the GDP–GNP wedge, FY 2002–2025. Current USD billions, fiscal-year basis. Source: PRPB external trade tables (Junta de Planificación de Puerto Rico, 2025c) and statistical appendix (Junta de Planificación de Puerto Rico, 2025a).

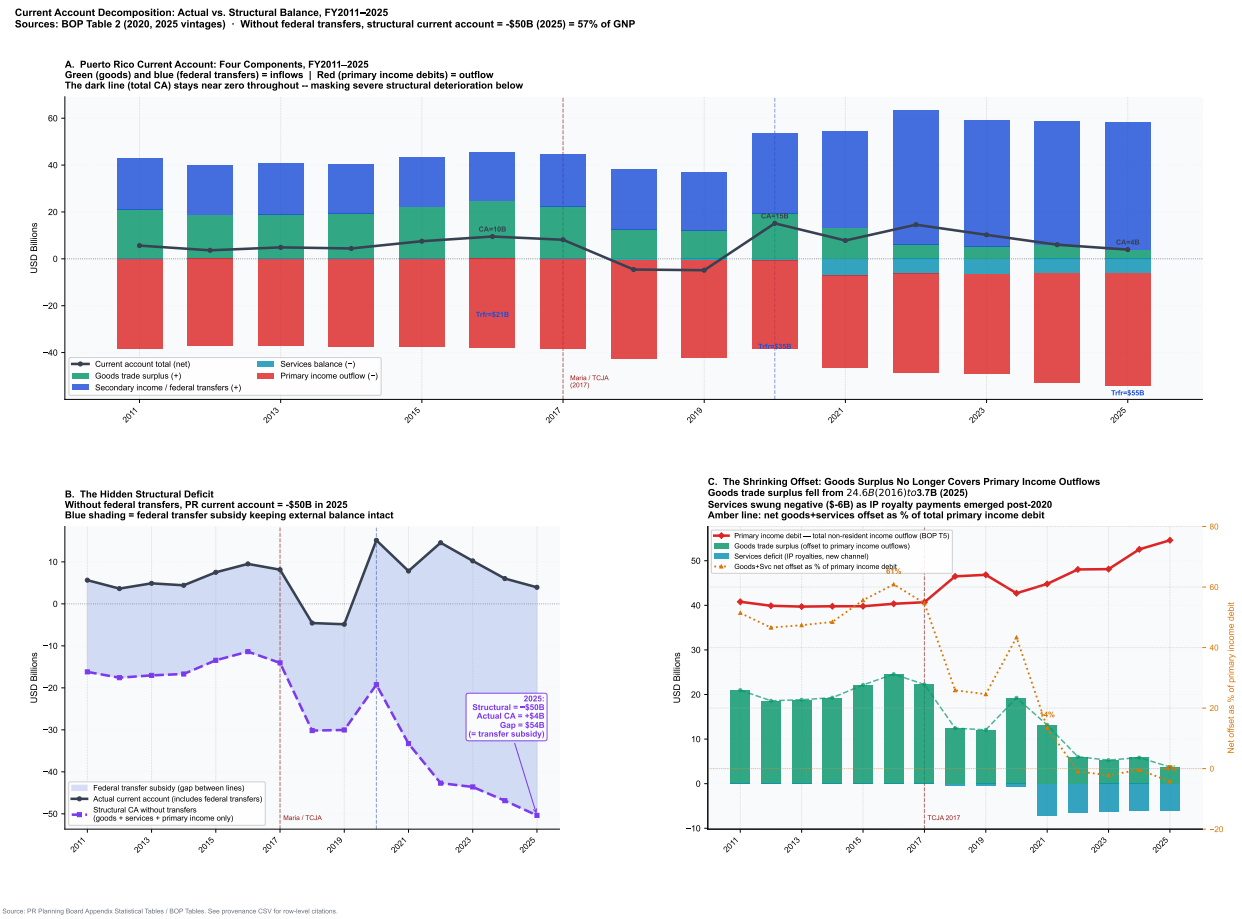

Figure 4: Current account decomposition: actual vs. structural balance, FY 2005–2025. Current USD billions, fiscal-year basis. The structural balance removes all secondary income (current transfers, including federal social benefits) from the current account identity. Source: PRPB BoP tables (Junta de Planificación de Puerto Rico, 2025b).

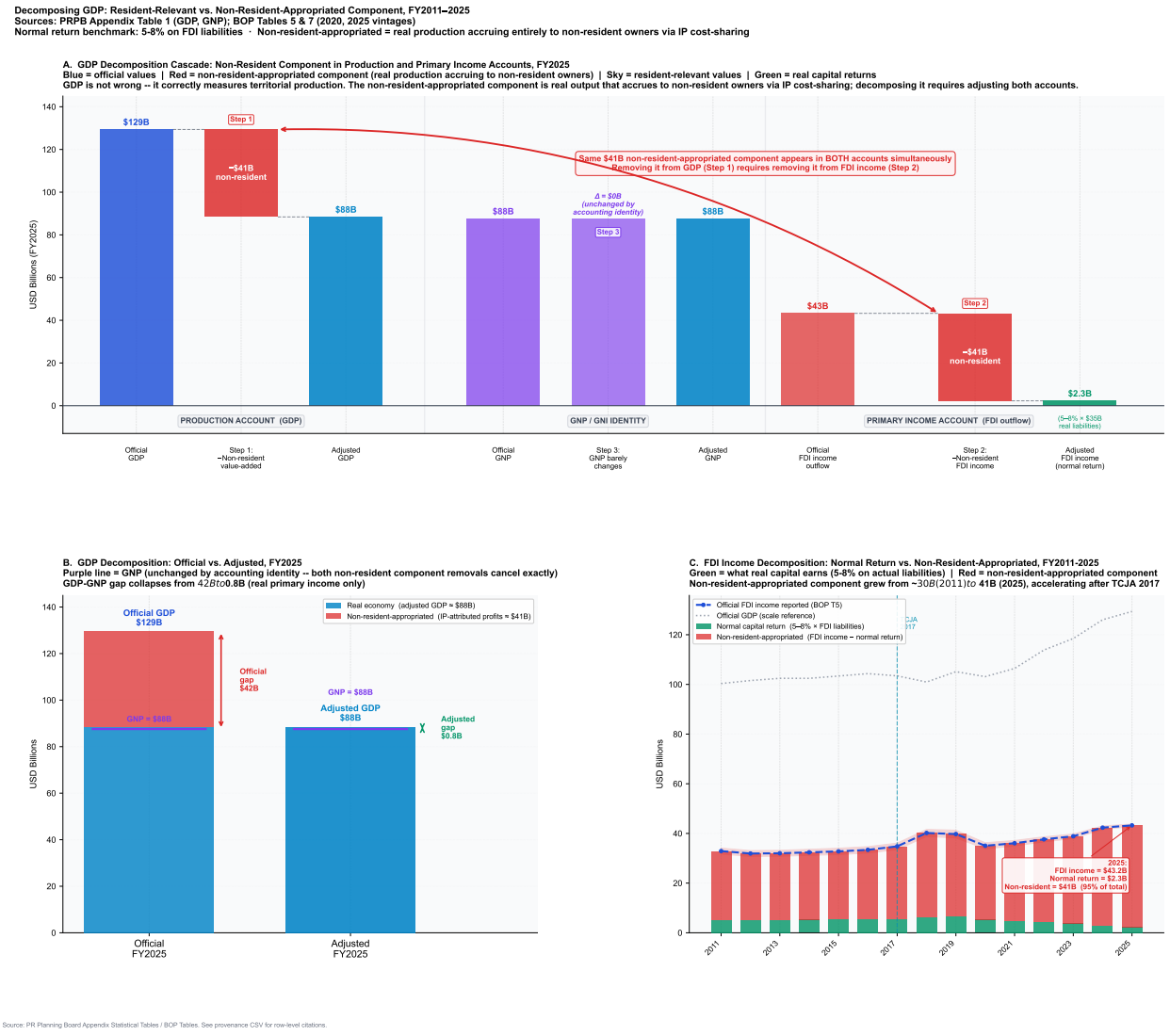

Figure 5: National accounts correction: resident-relevant gross product (RRGP), FY 2011–2025. Current USD billions, fiscal-year basis. RRGP strips non-resident-appropriated value added from GDP using a conservative benchmark return on measured FDI positions. Source: PRPB statistical appendix (Junta de Planificación de Puerto Rico, 2025a) and BoP/IIP tables (Junta de Planificación de Puerto Rico, 2025b).

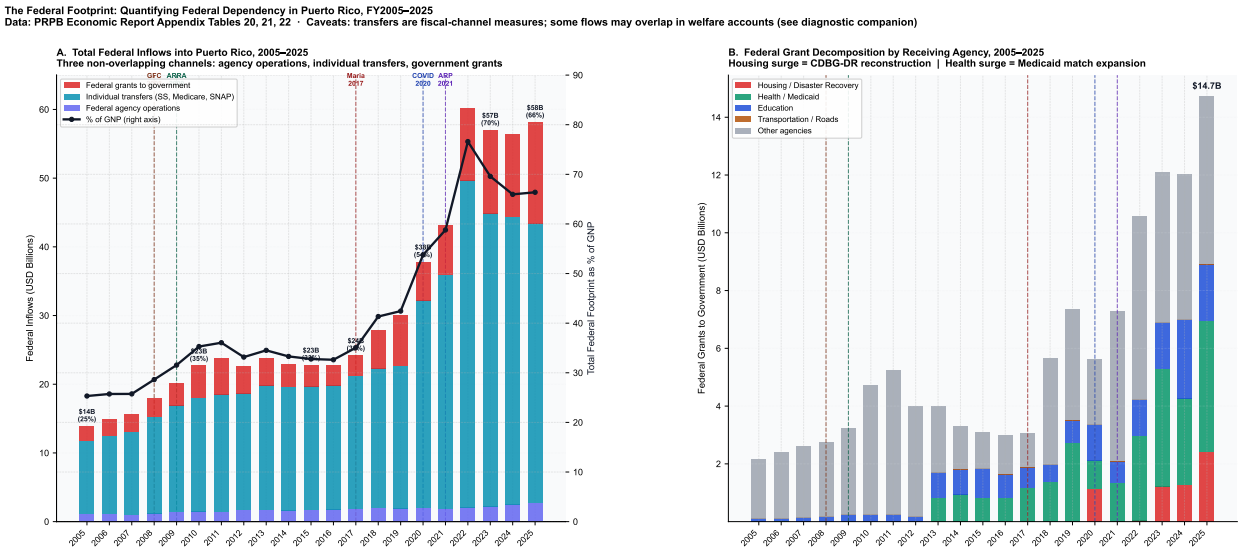

Figure 6: The federal footprint and the labor market constraint, FY 2005–2025. Current USD billions, fiscal-year basis. Left panel: federal income channels (agency operations, transfer payments to individuals, and grants to government) as absolute values and as share of GNP. Right panel: grant decomposition by program category. Source: PRPB statistical appendix, Tables 20, 21, and 22 (Junta de Planificación de Puerto Rico, 2025a). FY 2025 values are preliminary.

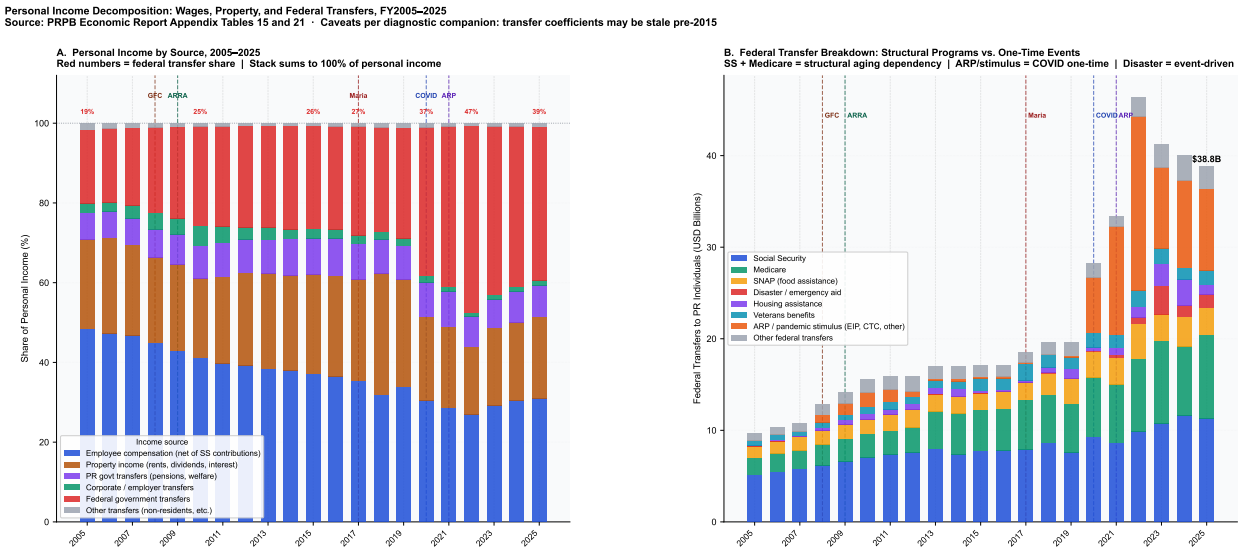

Figure 7: Income decomposition: federal transfers as personal income, FY 2005–2025. Current USD billions, fiscal-year basis. Left panel: personal income by source (Table 15). Right panel: transfer payments to individuals by federal program (Table 21). Source: PRPB statistical appendix (Junta de Planificación de Puerto Rico, 2025a). FY 2025 values are preliminary.

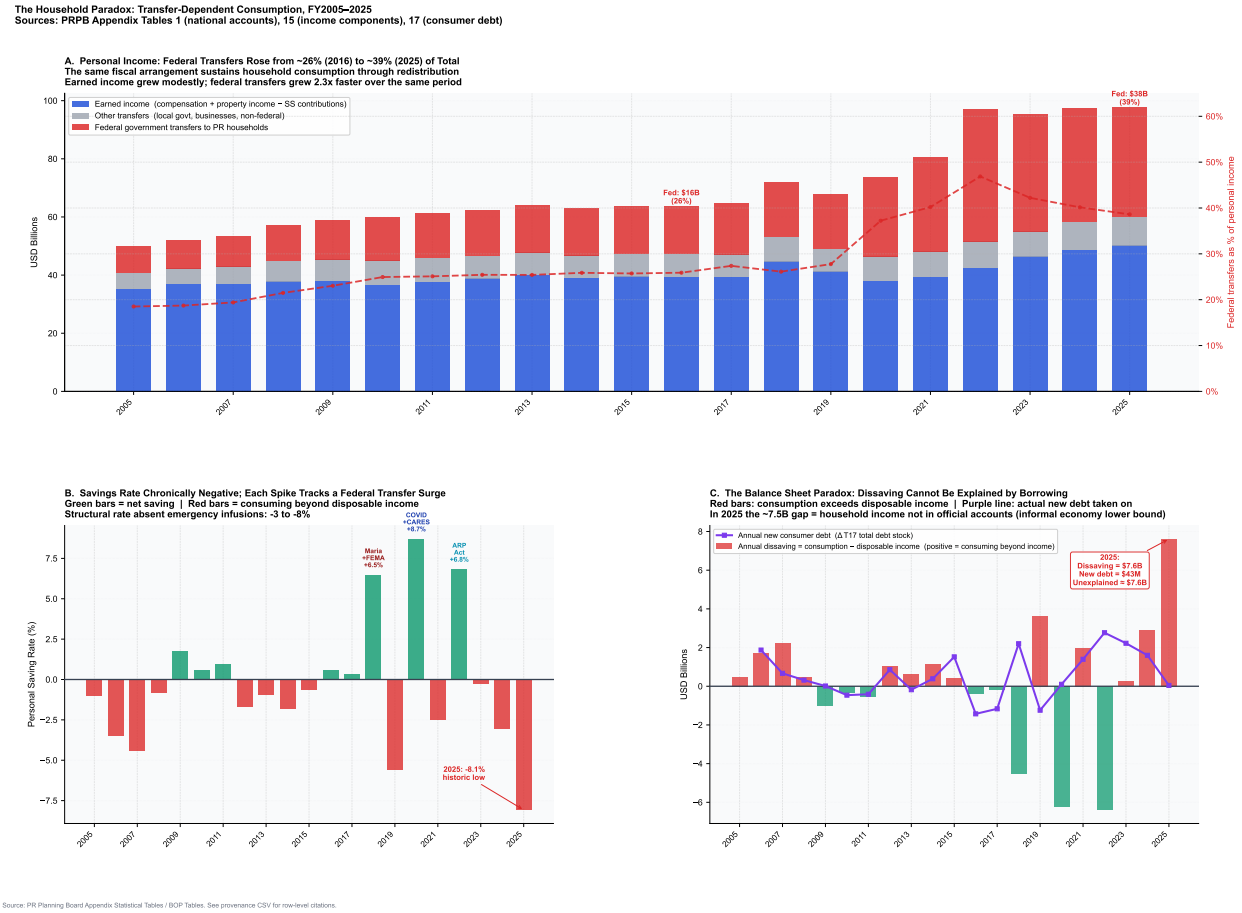

Figure 8: The household paradox: dissaving and the financing gap, FY 2005–2025. Current USD billions, fiscal-year basis. Panel A: personal income composition (earned vs. transfer). Panel B: saving rate (DPI − PCE as share of DPI). Panel C: annual dissaving vs. net new consumer debt (Table 17 total consumer debt stock). Source: PRPB statistical appendix, Tables 1, 15, and 17 (Junta de Planificación de Puerto Rico, 2025a). FY 2025 values are preliminary.

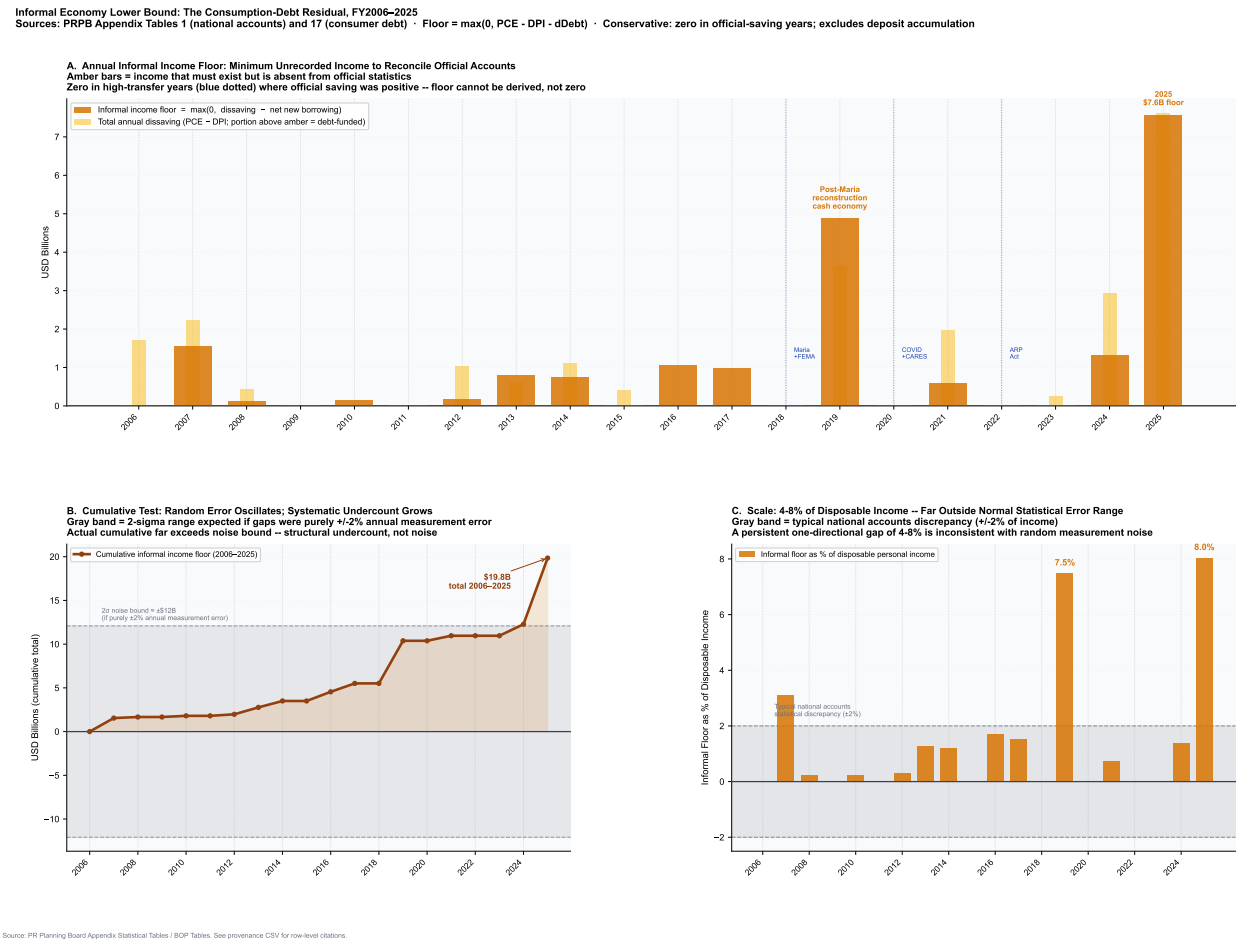

Figure 9: The non-observed economy floor, FY 2006–2025. $G_t = \max\{0, (PCE_t - DPI_t) - \Delta Debt_t\}$, current USD billions, fiscal-year basis. $\Delta Debt_t$ is the annual change in total consumer debt (PRPB Table 17). Source: PRPB statistical appendix, Tables 1 and 17 (Junta de Planificación de Puerto Rico, 2025a). FY 2025 values are preliminary.