Risk Sharing across U.S. States and EU Countries*

Martin Gervais
University of Georgia

Roozbeh Hosseini
University of Georgia

This version: March 12, 2026

First version: May 2022

Abstract

The capital-market channel in regional risk-sharing decompositions—widely interpreted as household portfolio diversification—is in fact dominated by a corporate buffer: firms absorb local output shocks through their profit margins, and the residual accrues to nationally diversified shareholders. We show this by decomposing the Asdrubali et al. (1996) capital-market coefficient for U.S. states (1985–2022) into corporate, earnings-adjustment, and property-income components; the corporate buffer accounts for 85–93% of the total. Bartik instruments confirm that the buffer reflects absorption of exogenous shocks, and multi-horizon regressions show that about 55% persists permanently while the rest dissipates within a few years. Extending the analysis to 27 EU countries (1995–2023) reveals a fourfold US–EU risk-sharing gap driven almost entirely by cross-border corporate ownership; a simple model accounts for three-quarters of this gap. These findings imply that deeper corporate integration across borders, rather than broader household equity participation, is the key margin for risk sharing in monetary unions.

JEL Classification: E21, F36, F45, G15

Keywords: Risk sharing, consumption smoothing, fiscal federalism, capital market integration, European monetary union

*We thank Mathias Hoffmann for sharing replication files, Larry Warren, as well as various seminar participants. We also thank Bob and Joe for stimulating discussions. All errors are our own.

1 Introduction

How much consumption risk do households bear when their region experiences an adverse economic shock? In a world of complete markets, idiosyncratic regional shocks would be fully insured: consumption in any given state or country would depend only on aggregate conditions, not on local output fluctuations (Cochrane 1991; Mace 1991). In practice, a variety of mechanisms—capital market diversification, fiscal transfers, and credit markets—provide partial insurance, but a substantial fraction of output risk typically remains unsmoothed (Obstfeld 1994; Lewis 1999).

We update the variance decomposition of Asdrubali et al. (1996) (henceforth ASY) for U.S. states through 2022 and apply the same four-channel decomposition to 27 EU member countries using World Bank World Development Indicators (WDI) data from 1995 to 2023. The ASY framework decomposes output variance into shares absorbed by capital markets (β_K), fiscal transfers (β_F), credit markets (β_C), and a residual that remains uninsured (β_U), with $\beta_K + \beta_F + \beta_C + \beta_U = 1$. The U.S.–EU comparison reveals a stark contrast: the U.S. insures roughly four times as much output risk as the EU, and the gap is driven almost entirely by the capital-market channel. Since the Global Financial Crisis (GFC), credit markets have emerged as a significant smoothing channel of similar magnitude in both regions, yet the U.S. retains its advantage through capital-market smoothing. But what the capital-market channel actually measures—and whether it truly reflects household portfolio diversification—has not been directly examined.

Our main contribution is a decomposition of β_K that reveals what this dominant channel actually captures. The existing literature has interpreted β_K as reflecting household portfolio diversification—cross-ownership of productive assets via equity markets.[1] While it has been recognized that the output-to-income wedge may include components beyond portfolio returns, no prior study has isolated or quantified the mechanisms within β_K. Using intermediate Bureau of Economic Analysis (BEA) aggregates, we decompose the wedge between gross state product and state income into three components: a *corporate buffer* (output to earnings), an *earnings adjustment* (place of work to place of residence), and *property income diversification* (net earnings to state income). We find that 85–93% of β_K is driven by the corporate buffer: when state output rises, corporate profits absorb a disproportionate share of the

[1]See, e.g., Asdrubali et al. (1996), Kalemli-Özcan et al. (2003), Demyanyk et al. (2007), and Balli et al. (2012).

shock, and these profits accrue to a nationally diversified shareholder base. Property income diversification—the channel traditionally associated with β_K—accounts for only 5–16%.

This finding reinterprets the U.S.–EU contrast. The corporate buffer mechanism operates within every EU country—French and German firms also have procyclical profit margins—but EU shareholders are predominantly domestic, so the buffer keeps income shocks within national borders rather than dispersing them across Europe.[2]

We also provide evidence on the identification and welfare implications of the corporate buffer. Instrumenting with Bartik shift-share predictors shows that β_{corp} is, if anything, *larger* when only supply-driven variation is used. Multi-horizon regressions reveal that about 55% of the one-year buffer persists permanently—consistent with genuine insurance through nationally diversified ownership—while the rest dissipates within a few years as wages adjust. A welfare-relevant measure that weights multi-horizon smoothing by the household discount factor puts the welfare value of capital-market smoothing at roughly 57% of the one-period estimate. Finally, a simple model maps β_K to a structural parameter ϕ—the degree of income diversification—and accounts for roughly three-quarters of the US–EU gap through differences in corporate ownership.

These findings overturn the prevailing interpretation of the ASY capital-market channel. Asdrubali et al. (1996) interpreted β_K as reflecting "cross-ownership of productive assets," and subsequent work built on this to argue that portfolio diversification enables industrial specialization (Kalemli-Özcan et al. 2003) and that banking deregulation improved β_K by facilitating cross-state equity holdings (Demyanyk et al. 2007). Our decomposition shows that the primary mechanism is *corporate*, not *household*: smoothing occurs because nationally owned firms absorb local output shocks through their profit margins before they reach workers' paychecks. For Kalemli-Özcan et al. (2003), this means the channel enabling specialization is national corporate ownership, not household equity portfolios. For Demyanyk et al. (2007), it suggests that banking deregulation improved risk sharing through cross-state corporate expansion rather than broader household portfolios. The policy implication shifts accordingly: improving European risk sharing requires deeper cross-border corporate integration, as envisioned by the European Capital Markets Union,[3] rather than broader household equity participation. More broadly, researchers should not read β_K as a direct measure of household

[2]Cross-border equity holdings within the eurozone remain far below full diversification (Lane and Milesi-Ferretti 2007; Coeurdacier and Rey 2013); see Section 5.3 for details.

[3]See European Commission (2015).

financial integration without further decomposition: the statistic that has anchored three decades of risk-sharing research primarily reflects corporate ownership structure.

Our work also relates to several other strands of the literature. Sørensen and Yosha (1998) applied the ASY decomposition to OECD and EU countries; our EU analysis updates and extends their findings (see also Furceri and Zdzienicka 2015; Milano 2017; Asdrubali et al. 2023). Atkeson and Bayoumi (1993) provided early evidence that capital markets smooth regional risk better in the U.S. than in Europe. Crucini (1999) found that Canadian provinces share risk at levels between U.S. states and international. Hoffmann and Shcherbakova-Stewen (2011) proposed a cross-sectional variant of the uninsured-risk regression; we adopt their approach but focus on decomposing what β_K captures rather than why it fluctuates. Our finding that multi-state firms drive capital-market smoothing connects to Giroud and Mueller (2019), who show that firms' internal networks absorb local shocks, and to Guiso et al. (2005), who document the micro-level analogue of our corporate buffer using Italian employer-employee data.

The paper proceeds as follows. Section 2 presents the framework, including the ASY variance decomposition, our decomposition of the capital-market channel, and a simple model of income diversification. Section 3 documents the results for U.S. interstate risk sharing. Section 4 tests the corporate-buffer mechanism using instrumental variables, multi-horizon regressions, and a welfare framework. Section 5 extends the analysis to European countries and calibrates the model to explain the US–EU gap. Section 6 concludes.

2 Framework

We begin with the variance decomposition of Asdrubali et al. (1996), which decomposes output fluctuations into four risk-sharing channels. We then introduce a decomposition of the capital-market channel using intermediate BEA income aggregates. A simple model of income diversification provides a structural interpretation of the decomposition, and we close the section with the panel regression framework used to estimate the channel coefficients.

2.1 Variance Decomposition

Let $Y_{i,t}$ denote per-capita output of region i in year t. The key identity is:

$$Y_{i,t} \equiv \frac{Y_{i,t}}{YN_{i,t}} \times \frac{YN_{i,t}}{YD_{i,t}} \times \frac{YD_{i,t}}{C_{i,t}} \times C_{i,t}, \tag{1}$$

where $YN_{i,t}$ is net income (output minus net factor income flowing to other regions), $YD_{i,t}$ is disposable income (net income minus net intergovernmental transfers), and $C_{i,t}$ is consumption expenditure. In the U.S. application, Y is gross state product (GSP), YN is state income (SI), and YD is disposable state income (DSI); in the European application, Y is gross domestic product (GDP), YN is gross national income (GNI), and YD is gross national disposable income (GNDI).

Taking logs and first-differencing, then computing the cross-sectional covariance of each component with $\Delta \log Y_{i,t}$ and dividing by $\text{Var}(\Delta \log Y_{i,t})$, we obtain:

$$\underbrace{\beta_{K,t}}_{\text{capital}} + \underbrace{\beta_{F,t}}_{\text{fiscal}} + \underbrace{\beta_{C,t}}_{\text{credit}} + \underbrace{\beta_{U,t}}_{\text{uninsured}} = 1. \tag{2}$$

Each β captures the fraction of cross-sectional output variance absorbed by the corresponding channel in year t. A higher β_U indicates less risk sharing—a larger fraction of output fluctuations passes through to consumption.

2.2 Decomposition of the Capital-Market Channel

The capital-market channel β_K is the single largest component in the ASY decomposition for U.S. states.[4] To understand what this channel captures, we introduce a further decomposition using intermediate income aggregates.

The identity (1) defines β_K via the regression of $\Delta \log(Y_i/YN_i)$ on $\Delta \log Y_i$. In the U.S. application, Y_i is gross state product and $YN_i \equiv \text{SI}_i$ is state income (personal income of

[4] See Section 3.2 and Tables 1 and 2.

residents). We decompose the wedge between GSP and state income into three steps:

$$\underbrace{\Delta \log\left(\frac{Y_i}{\mathrm{SI}_i}\right)}_{\beta_K} = \underbrace{\Delta \log\left(\frac{Y_i}{\mathrm{Earn}_i}\right)}_{\beta_{\mathrm{corp}}} + \underbrace{\Delta \log\left(\frac{\mathrm{Earn}_i}{\mathrm{EarnRes}_i}\right)}_{\beta_{\mathrm{adj}}} + \underbrace{\Delta \log\left(\frac{\mathrm{EarnRes}_i}{\mathrm{SI}_i}\right)}_{\beta_{\mathrm{prop}}}, \tag{3}$$

where Earn_i is earnings by place of work (compensation of employees plus proprietors' income) and $\mathrm{EarnRes}_i$ is net earnings by place of residence, which adjusts for social insurance contributions, cross-state commuting, and residence adjustments.[5] Each component has a structural interpretation:

- β_{corp}: the **corporate buffer**—the wedge between gross output and earnings. When state output rises, corporate profits, depreciation allowances, and indirect business taxes absorb part of the increase, so earnings (wages and proprietors' income) rise less than one-for-one with GSP. To the extent that the claims on these non-earnings components (corporate equity, depreciation-funded replacement investment) are held by nationally diversified shareholders, this wedge constitutes interstate risk sharing.
- β_{adj}: the **earnings adjustment**—the wedge between earnings by place of work and net earnings by place of residence, reflecting cross-state commuting and social insurance contributions.
- β_{prop}: **property income diversification**—the wedge between net earnings and total state income, reflecting dividends, interest, and rent received by residents from assets located in other states. This is the channel traditionally associated with household portfolio diversification.

Regressing each sub-component on $\Delta \log Y_i$ in a panel regression with year fixed effects yields three sub-coefficients that sum to β_K by construction. This decomposition reveals the structural sources of capital-market smoothing and allows us to distinguish between corporate and household mechanisms.

[5] See Appendix A for exact variable definitions and sources.

2.3 A Model of Income Diversification

Consider an economy with a continuum of locations $i \in [0, 1]$. Output in location i is

$$Y_i = e^{\theta_i} K_i^{\alpha} L_i^{1-\alpha}, \tag{4}$$

where θ_i is an idiosyncratic productivity shock, independent across locations, and $\alpha \in (0, 1)$ is the capital share. Under competitive factor pricing, wages are $w_i = (1 - \alpha) Y_i / L_i$ and the return to capital is $r_i = \alpha Y_i / K_i$. Each location is populated by a unit mass of agents. We distinguish two types:

- **Locally dependent agents** work in their home state, own locally invested assets (real estate, small-business equity, bank deposits), and have no access to geographically diversified financial markets. Their income—wages plus local capital returns—tracks local output.
- **Integrated agents** hold diversified portfolios through mutual funds or pension plans and earn labor income attributed to other states—as interstate commuters, remote workers employed by out-of-state firms, or federal employees. Their income is largely insulated from local productivity shocks.

Total income produced in location i is Y_i. In the short run, a fraction $\tilde{\alpha}$ of the *marginal* change in output accrues to capital income (corporate profits, depreciation, indirect business taxes) and a fraction $(1-\tilde{\alpha})$ goes to earnings (compensation plus proprietors' income). This short-run marginal profit share $\tilde{\alpha}$ generally exceeds the long-run capital share α, so that corporate margins absorb a disproportionate share of output fluctuations.[6]

Two forms of geographic integration create a wedge between income *produced* in a state and income *received* by its residents:

1. **Capital diversification.** A fraction μ of capital income flows through nationally

[6]The average gross operating surplus share of GSP across U.S. states is approximately $\alpha = 0.38$, while the corporate buffer ($\beta_{\text{corp}} = 0.45$) implies $\tilde{\alpha} = \alpha + (1-\alpha)\beta_{\text{corp}} \approx 0.66$ (see Section 5.3 and Appendix B)—consistent with strongly procyclical profit margins. Several mechanisms can generate $\tilde{\alpha} > \alpha$. Appendix B develops two examples: predetermined wages, which generate a temporary buffer that reverses as wages adjust, and national wage setting by multi-state firms, which generates a permanent buffer. The two are observationally equivalent at a single horizon; the multi-horizon evidence in Section 4.2 helps distinguish them.

diversified claims (corporate equity held through mutual funds and pension plans, depreciation-funded replacement investment by national firms, corporate tax revenue redistributed by the federal government). When local output deviates from the national average, a fraction μ of the resulting capital income change accrues to out-of-state shareholders, dampening the pass-through to state income.

2. **Labor market integration.** A fraction λ of labor income is earned by workers whose compensation is attributed to a state other than where it is produced—interstate commuters, remote workers employed by out-of-state firms, and federal employees compensated from national rather than local budgets.

Linearizing around the symmetric steady state ($Y_i = \bar{Y}$ for all i), state income—income received by residents of location i—is approximately

$$\mathrm{SI}_i \;\approx\; (1-\phi)\, Y_i + \phi\, \bar{Y}, \tag{5}$$

where the **degree of income diversification** is

$$\phi \;\equiv\; \mu\, \tilde{\alpha} \;+\; \lambda\, (1-\tilde{\alpha}). \tag{6}$$

The parameter ϕ captures the share of total income that is decoupled from local economic conditions: $(1-\phi)$ of income is tied to the local economy (wages at local firms, small-business profits) while ϕ is nationally diversified (corporate dividends, wages earned across state lines, federal transfers).

It follows that

$$\Delta \log\left(\frac{Y_i}{\mathrm{SI}_i}\right) \;\approx\; \phi\, \Delta \log Y_i \qquad \Longrightarrow \qquad \beta_K \;=\; \phi. \tag{7}$$

The ASY capital-market channel directly estimates the degree of income diversification. With no fiscal transfers or credit markets in the model, the uninsured share is

$$\beta_U \;=\; 1-\phi. \tag{8}$$

Three benchmarks illustrate the range:

1. **No integration** ($\mu = \lambda = 0$, hence $\phi = 0$): all income is local. $\beta_K = 0$, $\beta_U = 1$.

2. **Capital diversification only** ($\mu = 1$, $\lambda = 0$, hence $\phi = \tilde{\alpha}$): capital income is fully diversified but labor income stays local. $\beta_K = \tilde{\alpha}$, $\beta_U = 1-\tilde{\alpha}$. This is the corporate-buffer benchmark.

3. **Full integration** ($\mu = \lambda = 1$, hence $\phi = 1$): all income is nationally pooled. $\beta_K = 1$, $\beta_U = 0$.

The corporate buffer coefficient $\beta_{\text{corp}} = 1 - \rho$ directly measures how much less than one-for-one earnings track output, where ρ is the short-run earnings elasticity (Appendix B). Two distinct mechanisms can generate $\rho < 1$.

First, short-run wage rigidity: if wages are partially predetermined, a positive output shock raises profits more than earnings. To the extent that the resulting profit losses are borne by out-of-state shareholders, this provides temporary interstate insurance, but it reverses as wages adjust and does not represent permanent interstate insurance.

Second, national wage setting: if a fraction of workers are employed by national firms that set compensation based on aggregate rather than local conditions, local earnings track national rather than state output. The resulting profit shock is borne by geographically diversified shareholders—genuine interstate risk sharing. Distinguishing between these mechanisms requires evidence beyond the cross-sectional decomposition; Sections 4.1 and 4.2 provide such evidence using instrumental variables and multi-horizon regressions.

2.4 Estimation

To estimate the average degree of risk sharing over a given period, we run panel regressions of the form

$$\Delta \log\left(\frac{X_{i,t}}{\bar{X}_t}\right) = \alpha_t + \beta_j \, \Delta \log\left(\frac{Y_{i,t}}{\bar{Y}_t}\right) + \varepsilon_{i,t}, \tag{9}$$

where $j \in \{K, F, C, U\}$ indexes the channel, $\bar{X}_t$ and $\bar{Y}_t$ denote the relevant aggregates (the U.S. national average or the EU-wide average), X denotes the relevant variable for each channel (Y/YN for β_K, YN/YD for β_F, YD/C for β_C, and C for β_U), and α_t are year fixed effects. The coefficient β_j gives the average fraction of region-relative output variance absorbed (or left uninsured) by channel j over the sample period.

Following Hoffmann and Shcherbakova-Stewen (2011), we also estimate β_U year by year from cross-sectional regressions:

$$\Delta \log\left(\frac{C_{i,t}}{\bar{C}_t}\right) = a_t + \beta_{U,t}\,\Delta \log\left(\frac{Y_{i,t}}{\bar{Y}_t}\right) + u_{i,t}. \tag{10}$$

The time series $\{\beta_{U,t}\}$ allows us to track how the degree of uninsured risk evolves over time.

The remainder of the paper proceeds in three steps. Section 3 applies the decomposition to U.S. states, documenting that the corporate buffer accounts for 85–93% of β_K. Section 4 then tests the mechanism: Bartik instruments confirm that the buffer absorbs exogenous shocks, and multi-horizon regressions separate permanent insurance from temporary delay. Finally, Section 5 uses the EU as an out-of-sample test: the same profit cyclicality exists within every EU country, but without cross-border corporate ownership it does not translate into risk sharing—and a simple calibration of the model accounts for three-quarters of the US–EU gap.

3 U.S. Interstate Risk Sharing

3.1 Data

We use per-capita data from the U.S. Bureau of Economic Analysis (BEA) for 50 states plus the District of Columbia from 1985 to 2022. Output is gross state product; state income is personal income of residents (earnings, property income, and transfers); disposable state income subtracts net federal taxes; and consumption is personal consumption expenditure by state, available from 1997 (retail sales are used as a proxy for earlier years). Appendix A.1 provides detailed variable definitions and sources.

3.2 Four-Channel Decomposition

Table 1 reports variance-weighted averages of the year-by-year cross-sectional covariance ratios for five sub-periods. Over the full sample (1985–2022), capital markets absorb roughly 59% of state output fluctuations ($\beta_K = 0.59$), with fiscal transfers accounting for about 8% ($\beta_F = 0.08$) and credit markets for 11% ($\beta_C = 0.11$). The residual fraction left uninsured is $\beta_U = 0.22$. The sub-periods reveal a non-monotonic pattern. In the earliest period (1985–

1995), capital markets dominate (0.66), credit markets contribute little (0.04), and $\beta_U = 0.21$. The 1996–2007 period sees β_U rise sharply to 0.43, driven by a negative credit-market channel (-0.15). The post-GFC decade (2010–2019)—our preferred post-crisis baseline, since it excludes the pandemic disruption—then shows a dramatic reversal: β_C rises to 0.36 while β_K falls to 0.42, and β_U drops to 0.15. Extending through 2022 lowers β_U further to 0.07, though the 2020–2021 observations are unusual: pandemic lockdowns, CARES Act transfers, and business support programs (PPP) likely distort the decomposition, which is why we treat 2010–2019 as the preferred baseline.

Table 1: Variance Decomposition of Interstate Risk Sharing

Period	β_K	β_F	β_C	β_U	Sum
1985–2022	0.59	0.08	0.11	0.22	1.00
1985–1995	0.66	0.08	0.04	0.21	1.00
1996–2007	0.65	0.07	-0.15	0.43	1.00
2010–2019	0.42	0.07	0.36	0.15	1.00
2010–2022	0.52	0.10	0.31	0.07	1.00

Notes: Each row reports variance-weighted averages of the year-by-year cross-sectional covariance ratios. By construction, $\beta_K + \beta_F + \beta_C + \beta_U = 1$. Sample: 50 states plus the District of Columbia.

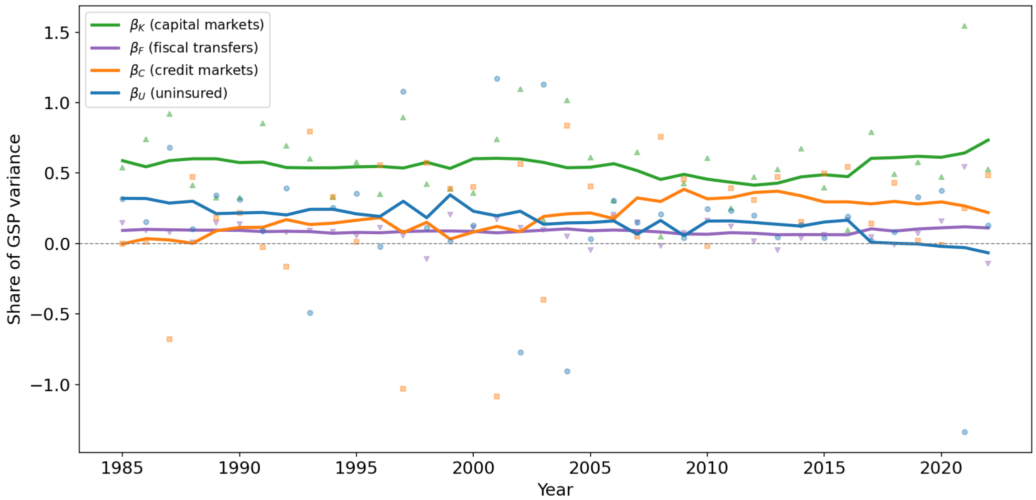
Figure 1 plots the year-by-year variance decomposition, showing the evolution of all four channels over time. Capital markets (β_K) dominate throughout the sample, while the post-GFC emergence of credit-market smoothing (β_C) is clearly visible.

Table 2 reports panel regression estimates of equation (9) with standard errors clustered by state. The point estimates match the variance decomposition, and β_K is highly significant in every sub-period. The key takeaway is that capital markets dominate: β_K ranges from 0.42 to 0.66 across sub-periods, dwarfing fiscal transfers ($\beta_F \approx 0.07$–0.10) and accounting for the bulk of observed smoothing.

3.3 Decomposing the Capital-Market Channel

We now apply the decomposition of Section 2.2 to U.S. states. Table 3 reports the results. The finding is striking: the corporate buffer accounts for 85–93% of β_K across all samples. Over the full sample (1998–2022), $\beta_{\text{corp}} = 0.45$ out of $\beta_K = 0.49$ (92%). The share is similar

Figure 1: Variance Decomposition of U.S. Interstate Risk Sharing, 1985–2022



Notes: Year-by-year cross-sectional covariance decomposition: β_K (capital markets), β_F (fiscal transfers), β_C (credit markets), β_U (uninsured). Dots show annual estimates; lines show 10-year centered moving averages. By construction, $\beta_K + \beta_F + \beta_C + \beta_U = 1$ each year. Source: U.S. Bureau of Economic Analysis (BEA).

Table 2: Panel Regressions: U.S. Interstate Risk Sharing

Period	β_K	β_F	β_C	β_U
1985–2022	0.59***	0.08***	0.11*	0.22***
	(0.06)	(0.01)	(0.06)	(0.05)
1985–1995	0.66***	0.08***	0.04	0.21*
	(0.11)	(0.02)	(0.09)	(0.09)
1996–2007	0.65***	0.07***	−0.15	0.43***
	(0.06)	(0.02)	(0.10)	(0.11)
2010–2019	0.42***	0.07***	0.36***	0.15***
	(0.04)	(0.02)	(0.04)	(0.04)
2010–2022	0.52***	0.10*	0.31***	0.07
	(0.09)	(0.04)	(0.08)	(0.15)

Notes: OLS regressions with year fixed effects. Standard errors clustered by state in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Sample: 50 states plus the District of Columbia.

Table 3: Decomposing the Capital-Market Channel: U.S. States

	Full sample		Pre-GFC		Post-GFC	
Channel	Coeff.	Share	Coeff.	Share	Coeff.	Share
β_K (total: GSP $\rightarrow$ SI)	0.49***		0.56***		0.42***	
	(0.07)		(0.07)		(0.04)	
β_{corp} (corporate buffer)	0.45***	92%	0.48***	85%	0.39***	93%
	(0.06)		(0.06)		(0.06)	
β_{adj} (earnings adj.)	−0.01	−1%	0.00	−1%	0.01	2%
	(0.01)		(0.02)		(0.01)	
β_{prop} (property income)	0.04	9%	0.09	16%	0.02	5%
	(0.08)		(0.06)		(0.06)	

Notes: Panel OLS regressions with year fixed effects. Standard errors clustered by state in parentheses. Full sample: 1998–2022; Pre-GFC: 1998–2007; Post-GFC: 2010–2019. Sample: 51 states (50 states plus D.C.). The three sub-channels sum to β_K by construction. Earnings data from BEA SAINC4; GSP data from BEA SAGDP2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

across sub-periods: $\beta_{\text{corp}} = 0.48$ out of $\beta_K = 0.56$ pre-GFC and 0.39 out of 0.42 post-GFC. Property income diversification—the channel emphasized in the existing literature—accounts for only 5–16% of β_K ($\beta_{\text{prop}} = 0.09$ pre-GFC, 0.02 post-GFC). The earnings adjustment channel is economically negligible.

To appreciate the magnitude of this finding, consider how a researcher would interpret $\beta_K = 0.49$ under the standard reading of the ASY framework. The entire coefficient would be attributed to household portfolio diversification—cross-ownership of productive assets through equity markets—implying that nearly half of all interstate insurance is provided by households holding geographically diversified financial portfolios. Our decomposition shows that this interpretation is largely wrong: 92% of β_K reflects corporate shock absorption, while the household portfolio channel accounts for at most 9%.

The dominance of the corporate buffer also has implications for the time-series pattern. The decline in β_K from 0.56 pre-GFC to 0.42 post-GFC is driven by both a smaller corporate buffer (β_{corp} falls from 0.48 to 0.39) and a decline in property income diversification (β_{prop} falls from 0.09 to 0.02, though neither estimate is significant).

More fundamentally, the corporate buffer implies that the *earnings-to-output elasticity* is well below unity. The coefficient β_{corp} directly measures one minus this elasticity: when state GSP rises by 1%, state earnings rise by only $1 - \beta_{\text{corp}} \approx 0.52\%$ pre-GFC (0.61% post-GFC). The remaining 0.48% (0.39%) is absorbed by corporate profits, depreciation, and indirect business taxes—components of GSP that flow to nationally diversified corporate shareholders rather than to local workers. Appendix C confirms that this wedge is driven almost entirely by gross operating surplus (GOS) rather than by taxes on production and imports (TOPI): a decomposition using the income-side identity GSP = Compensation + GOS + TOPI_{net} (Table 10) shows that TOPI accounts for less than 6% of the GSP-to-compensation wedge in every sub-period. National data on dividend smoothing further corroborate the buffer interpretation (Figure 6). The gross operating surplus share of GSP averages 38% across states and years, so the implied short-run marginal profit share $\tilde{\alpha} = \alpha + (1-\alpha)\,\beta_{\text{corp}} \approx 0.68$ pre-GFC substantially exceeds the average profit share—consistent with strongly procyclical profit margins (see Section 5.3 for a formal derivation).[7]

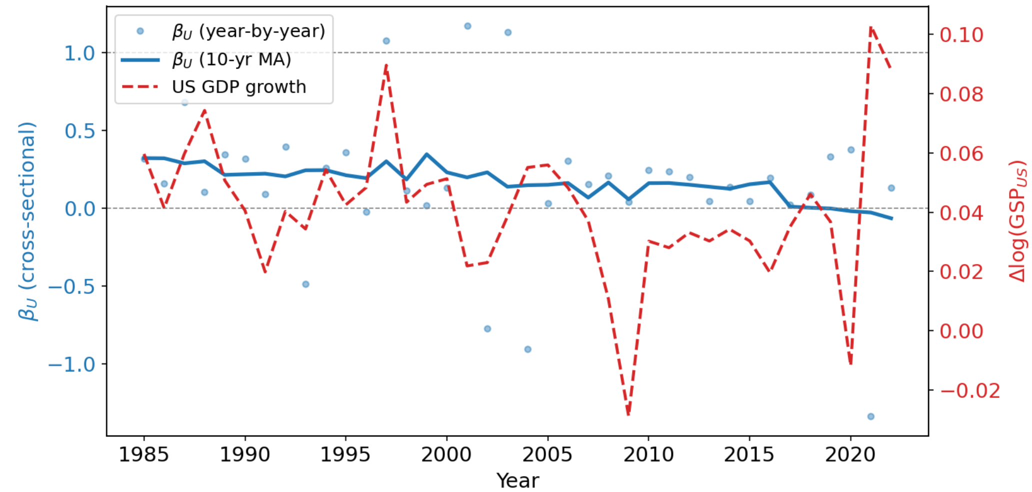
Figure 2 plots the year-by-year cross-sectional $\beta_{U,t}$ estimates alongside a 10-year centered moving average. The moving average reveals a clear pattern: $\beta_{U,t}$ hovers near 0.4 through the late 1990s, then declines steadily after the mid-2000s, reaching values near zero by the 2010s—confirming the post-GFC improvement in risk sharing documented in the panel regressions. The annual estimates are volatile because each cross-sectional regression has only 51 observations; the panel estimates in Table 2 are far more precise and should be viewed as the primary results.

4 Testing the Corporate-Buffer Mechanism

Does the corporate buffer represent genuine interstate insurance, or is it an artifact of endogenous profit-margin dynamics? We subject the accounting result to three tests. First, we instrument state output growth with Bartik shift-share predictors to isolate supply-driven variation; if the buffer merely reflects demand-driven margin compression, the IV estimate should be smaller than OLS. Second, we estimate the buffer at horizons of one to five years; if it reflects only short-run wage rigidity, the effect should vanish at longer horizons. Third, we use the multi-horizon estimates to compute a welfare-relevant measure of capital-market

[7] Equivalently, the state-level elasticity of compensation to GSP is approximately 0.5, while the elasticity of gross operating surplus to GSP exceeds 1.5. This is consistent with the procyclicality of profits relative to wages emphasized by Hagedorn and Manovskii (2008).

Figure 2: Cross-Sectional β_U for U.S. States, 1985–2022



Notes: Each point is the OLS coefficient from regressing $\Delta \log(C_i/C_{US})$ on $\Delta \log(\text{GSP}_i/\text{GSP}_{US})$ across 51 states in a given year. The solid line is a 10-year centered moving average. The dashed line shows U.S. aggregate GSP growth (right axis). Source: U.S. Bureau of Economic Analysis (BEA).

smoothing that accounts for both the permanent and temporary components.

4.1 Instrumental Variables: Isolating Supply-Side Shocks

A potential concern with the OLS estimates in Table 3 is that the ASY framework identifies risk-sharing coefficients from the cross-sectional covariance of income components with output. This conflates supply and demand shocks: if a local demand shock compresses profit margins, β_{corp} captures this mechanical response even though no cross-state insurance has occurred. To isolate variation driven by supply-side shocks, we instrument $\Delta \log(\text{GSP}_i/\text{GSP}_{US})$ with a Bartik shift-share instrument (Bartik 1991):

$$z_{it} = \sum_j \omega_{ij,0}\, g_{jt}^{-i}, \tag{11}$$

where $\omega_{ij,0}$ is industry j's share of state i's GDP in the base year (1997), and g_{jt}^{-i} is the leave-one-out national growth rate of industry j in year t. The instrument predicts state-level GDP growth from national industry trends interacted with the state's initial industry composition, using 16 broad NAICS sectors from BEA table SAGDP2.[8]

Table 4 reports the results. The instrument is strong: the first-stage F-statistic on the excluded instrument exceeds 60 in all samples. The key finding is that β_{corp} is *larger* under IV than under OLS—0.63 versus 0.45 for the full sample, 0.54 versus 0.48 pre-GFC, and 0.49 versus 0.39 post-GFC—and remains highly significant in every case. If anything, the OLS estimates are conservative: isolating supply-side variation strengthens the corporate buffer. This is consistent with the interpretation that firms absorb output shocks through their profit margins, not that demand shocks mechanically compress the capital share. Total β_K is smaller under IV because β_{prop} turns negative: supply-driven booms raise local property values and rents, making property income procyclical with respect to exogenous shocks. The traditional portfolio-diversification channel provides no smoothing against supply variation; the corporate buffer accounts for all of it.

4.2 The Horizon Structure of Capital-Market Smoothing

The buffer mechanism generates a testable prediction about the horizon structure of β_K: if firms absorb *temporary* shocks through retained earnings but eventually adjust payouts when shocks persist, then β_{corp} should be larger at short horizons and decline as the horizon lengthens.

We test this by replacing the one-year log differences $\Delta \log x_{it} = \log x_{it} - \log x_{it-1}$ in the ASY regressions with h-year differences $\Delta^h \log x_{it} = \log x_{it} - \log x_{it-h}$ for $h = 1, \ldots, 5$. Table 5 reports the β_K decomposition at each horizon for the full sample (1998–2022), and Figure 3 plots the results.

The results are consistent with the buffer prediction. β_K declines from 0.49 at $h = 1$ to 0.27 at $h = 5$, a 45% reduction. The decline is driven almost entirely by β_{corp}, which falls from 0.45 to 0.28, while β_{adj} and β_{prop} remain small and stable across all horizons.

The horizon pattern has a natural interpretation. At the one-year frequency, a negative output shock reduces corporate profits but leaves wages and dividends largely unchanged—the

[8] The sectors are: agriculture, mining, utilities, construction, manufacturing, wholesale trade, retail trade, transportation, information, finance & real estate, professional & management services, administrative services, education & health care, arts & accommodation, other services, and government. Following Borusyak et al. (2022), identification requires the national industry growth rates (the "shifts") to be exogenous to individual state conditions, while the industry shares serve as exposure weights.

Table 4: β_K Decomposition: OLS vs. Bartik IV

	Full sample (1998–2022)		Pre-GFC (1998–2007)		Post-GFC (2010–2019)	
Channel	OLS	IV	OLS	IV	OLS	IV
β_K (total: GSP $\rightarrow$ SI)	0.49***	0.37**	0.56***	0.21*	0.42***	0.36***
	(0.07)	(0.14)	(0.07)	(0.12)	(0.04)	(0.04)
β_{corp} (corporate buffer)	0.45***	0.63***	0.48***	0.54***	0.39***	0.49***
	(0.06)	(0.12)	(0.06)	(0.14)	(0.06)	(0.14)
β_{adj} (earnings adj.)	−0.01	−0.01	−0.00	−0.01	0.01	−0.02
	(0.01)	(0.02)	(0.02)	(0.05)	(0.01)	(0.02)
β_{prop} (property income)	0.04	−0.25	0.09	−0.32**	0.02	−0.11
	(0.08)	(0.20)	(0.06)	(0.13)	(0.06)	(0.14)
First-stage F		97.5		62.1		103.0

Notes: Panel regressions with year fixed effects. Standard errors clustered by state in parentheses. The instrument is a Bartik shift-share predictor of state GDP growth, constructed from 16 broad NAICS industry sectors using 1997 base-year shares and leave-one-out national industry growth rates (equation 11). First-stage F is the Wald statistic on the excluded instrument in the first-stage regression of $\Delta \log(\text{GSP}_i/\text{GSP}_{US})$ on the Bartik instrument and year fixed effects. Sample: 51 states (50 states plus D.C.). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

firm absorbs the shock through lower retained earnings. As the horizon lengthens, persistent shocks eventually feed through to wages, investment, and payouts, eroding the buffer. The fact that β_K stabilizes near 0.27 at long horizons suggests a permanent component of capital-market smoothing—likely reflecting cross-state ownership diversification—that persists even after the buffer is exhausted.

4.3 Welfare-Relevant Insurance

The one-period ASY framework measures risk sharing at the annual frequency. But the welfare cost of uninsured shocks depends on the *present value* of uninsured income, not just its one-year realization. If part of the corporate buffer is temporary—firms absorb shocks initially but pass them through over time—the one-period β_K overstates the welfare-relevant insurance. We develop a simple framework that connects the multi-horizon estimates from Table 5 to a welfare-relevant measure of capital-market smoothing.

Table 5: β_K Decomposition by Horizon

h	β_K	β_{corp}	β_{adj}	β_{prop}
1	0.49***	0.45***	−0.01	0.04
	(0.07)	(0.06)	(0.01)	(0.08)
2	0.37***	0.39***	0.01	−0.02
	(0.06)	(0.06)	(0.01)	(0.06)
3	0.28***	0.31***	0.01	−0.04
	(0.06)	(0.07)	(0.02)	(0.05)
4	0.27***	0.29***	0.01	−0.03
	(0.06)	(0.07)	(0.02)	(0.04)
5	0.27***	0.28***	0.01	−0.02
	(0.06)	(0.07)	(0.02)	(0.04)

Notes: Panel OLS regressions with year fixed effects. Standard errors clustered by state in parentheses. Each row uses h-year log differences of state variables relative to the U.S. aggregate. The three sub-channels sum to β_K by construction. Sample: 51 states (50 states plus D.C.), 1998–2022. Results are essentially unchanged if the year 2020 is excluded. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Shock transmission. Consider a permanent idiosyncratic productivity shock ε_i that raises the output of state i relative to the national aggregate in every period. At horizon h after the shock, a fraction $\varphi(h)$ of the output deviation is absorbed by capital-market smoothing (primarily the corporate buffer), so that state income deviates by $(1 - \varphi(h))\varepsilon_i$ from the aggregate.

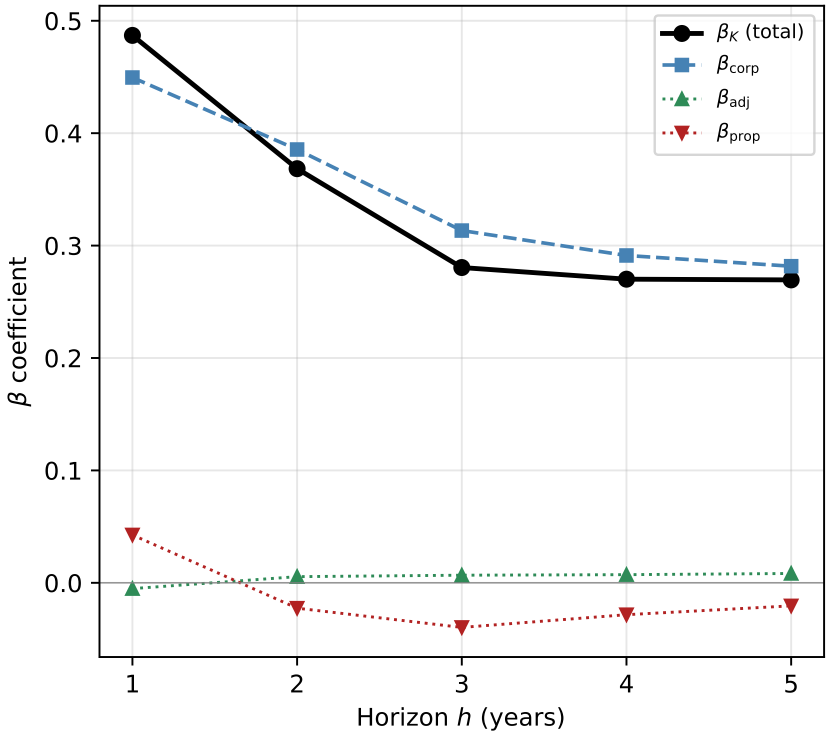
The function $\varphi(h)$ can be decomposed into a permanent and a temporary component:

$$\varphi(h) \;=\; \varphi^{\text{perm}} \;+\; \varphi^{\text{temp}}(h),$$

where φ^{perm} reflects national ownership diversification (the national-wage-setting mechanism, Appendix B) and is constant across horizons, while $\varphi^{\text{temp}}(h) \to 0$ as $h \to \infty$ captures short-run wage rigidity (the predetermined-wage mechanism, Appendix B) that dissipates as wages adjust.[9] The multi-horizon estimates in Table 5 trace out the path of $\varphi(h) = \beta_K(h)$.

[9]Appendix B formalizes these two mechanisms. If wages are partially predetermined, a positive output shock raises profits more than earnings, generating a temporary buffer that reverses as wages adjust ($\beta_{\text{corp}} = 1 - \rho_w$, where ρ_w indexes wage flexibility). If instead a fraction η of workers are employed by national firms that set compensation based on aggregate rather than local conditions, the buffer is permanent ($\beta_{\text{corp}} = \eta$). The two examples are observationally equivalent at a single horizon but have different implications for the decay path

Figure 3: β_K Decomposition by Horizon



Notes: Full sample, 1998–2022. Circles: β_K (total). Squares: β_{corp} (corporate buffer). Up-triangles: β_{adj} (earnings adjustment). Down-triangles: β_{prop} (property income).

Household problem. To translate this income profile into a welfare measure, consider a representative household in state i with log utility $\sum_{t=0}^{\infty} \beta^t \log C_{it}$ that can borrow or save at a risk-free rate $R = 1/\beta$. Standard permanent-income reasoning implies that the household consumes the annuity value of lifetime income. In log deviations from the aggregate:

$$c_i \;=\; (1 - \varphi_W)\,\varepsilon_i,$$

where the welfare-relevant insurance is the present-value-weighted average of smoothing across all horizons:

$$\varphi_W \;=\; (1-\beta)\sum_{h=1}^{\infty} \beta^{h-1}\,\varphi(h). \tag{12}$$

of $\varphi(h)$.

When β is close to 1, long horizons dominate and $\varphi_W \approx \varphi^{\text{perm}}$. When $\beta = 0$, only the short run matters and $\varphi_W = \varphi(1)$.

Calibration. Using the full-sample multi-horizon estimates from Table 5—$\varphi(1) = 0.49$, $\varphi(2) = 0.37$, $\varphi(3) = 0.28$, $\varphi(4) = 0.27$, $\varphi(5) = 0.27$—and assuming $\varphi(h) = 0.27$ for all $h \geq 5$, equation (12) with $\beta = 0.96$ yields

$$\varphi_W \ \approx \ 0.28.$$

The welfare-relevant capital-market insurance is thus about **57%** of the one-period estimate (0.28/0.49). The permanent component $\varphi^{\text{perm}} \approx 0.27$—the level at which $\beta_K(h)$ stabilizes—accounts for 55% of the one-year β_K, and is attributable to national ownership diversification. The remaining 45% ($\varphi^{\text{temp}} = 0.49 - 0.27 = 0.22$) reflects temporary wage rigidity that dissipates within 3–4 years.

Interpretation. The correction from $\varphi(1)$ to φ_W matters quantitatively: the welfare-relevant uninsured share from the capital channel rises from $1 - 0.49 = 0.51$ to $1 - 0.28 = 0.72$. However, two caveats apply. First, this calculation assumes perfectly persistent shocks; transitory shocks would be partially self-insured through saving even without capital-market smoothing, so the welfare cost of the temporary buffer's reversal is smaller. Second, equation (12) assumes perfect credit markets. When credit markets are imperfect—as the substantial β_C estimates in Tables 2 and 7 suggest—short-run income smoothing has greater welfare value because households cannot freely borrow against future income. The welfare-relevant insurance therefore lies between $\varphi^{\text{perm}} \approx 0.27$ (perfect credit, permanent shocks) and $\varphi(1) = 0.49$ (no credit access or purely transitory shocks).

Taken together, the three exercises in this section establish that the corporate buffer is not merely an accounting artifact. The accounting decomposition in Section 3.3 identifies the channel; the Bartik IV confirms that it absorbs exogenous, supply-driven shocks rather than reflecting endogenous margin compression; and the multi-horizon regressions separate permanent insurance through nationally diversified ownership (about 60% of the buffer) from temporary smoothing through wage rigidity (the remaining 40%). Even after discounting the temporary component, the welfare-relevant capital-market insurance is substantial—roughly 57% of the one-period estimate—and is driven almost entirely by corporate ownership structure rather than household portfolio diversification.

5 European Risk Sharing and the US–EU Gap

The corporate-buffer mechanism generates a sharp out-of-sample prediction: profit margins are procyclical in every economy, but the buffer produces cross-border risk sharing only when corporate equity is held across borders. European firms absorb output shocks through their profit margins just as American firms do, yet EU shareholders are predominantly domestic. If the mechanism is correct, the EU should exhibit near-zero β_K despite comparable profit cyclicality—and the US–EU risk-sharing gap should be attributable to corporate ownership structure rather than to generic "capital-market underdevelopment." We test this prediction by performing the full four-channel variance decomposition for the 27 EU member countries using World Bank WDI data from 1995 to 2023.[10]

5.1 Data

Our primary data source for the EU analysis is the World Bank World Development Indicators (WDI), which provides GDP, GNI, and household consumption in constant 2015 US dollars, as well as net secondary income (current transfers) in current US dollars and population, for all 27 EU member states from 1995 to 2023. We construct gross national disposable income (GNDI) by deflating net transfers using the implicit GNI deflator. The four-level identity is then GDP $\rightarrow$ GNI $\rightarrow$ GNDI $\rightarrow$ Consumption, exactly paralleling the GSP $\rightarrow$ SI $\rightarrow$ DSI $\rightarrow$ C identity used for U.S. states. All variables are converted to per-capita terms and expressed as log ratios relative to the population-weighted EU-27 aggregate, then first-differenced, exactly as in the U.S. analysis. See Appendix A.2 for detailed variable definitions and sources.

5.2 Results

Table 6 reports variance-weighted averages of the year-by-year cross-sectional covariance ratios for EU-27 countries, analogous to Table 1 for U.S. states. The contrast is stark. Over the full WDI sample (1995–2023), capital markets absorb only 7% of cross-country GDP variance ($\beta_K = 0.07$), fiscal transfers account for 1% ($\beta_F = 0.01$), and credit markets absorb 2%

[10] Earlier studies such as Sørensen and Yosha (1998) and Kalemli-Özcan et al. (2003) performed cross-country decompositions using OECD data. See Appendix A.2 for details on data sources and the construction of GNDI.

($\beta_C = 0.02$). Fully 91% of GDP fluctuations pass through to consumption ($\beta_U = 0.91$). The pre-GFC period (1995–2007) is even worse: the credit channel is negative ($\beta_C = -0.23$) and β_U exceeds unity at 1.19. The post-GFC decade (2010–2019) shows a dramatic improvement, driven entirely by the credit-market channel: β_C rises to 0.37, bringing β_U down to 0.61. Including the COVID years (2010–2023) yields similar estimates ($\beta_U = 0.59$), suggesting the improvement is robust to the pandemic disruption.

Table 6: Variance Decomposition of EU Cross-Country Risk Sharing

Period	β_K	β_F	β_C	β_U	Sum
1995–2023	0.07	0.01	0.02	0.91	1.00
1995–2007	0.02	0.01	−0.23	1.19	1.00
2010–2019	0.03	−0.01	0.37	0.61	1.00
2010–2023	0.09	−0.01	0.32	0.59	1.00

Notes: Each row reports variance-weighted averages of the year-by-year cross-sectional covariance ratios. By construction, $\beta_K + \beta_F + \beta_C + \beta_U = 1$. Sample: 27 EU member states. Data: World Bank WDI. The four-level identity is GDP $\to$ GNI $\to$ GNDI $\to$ Consumption.

Table 7: Panel Regressions: EU Cross-Country Risk Sharing

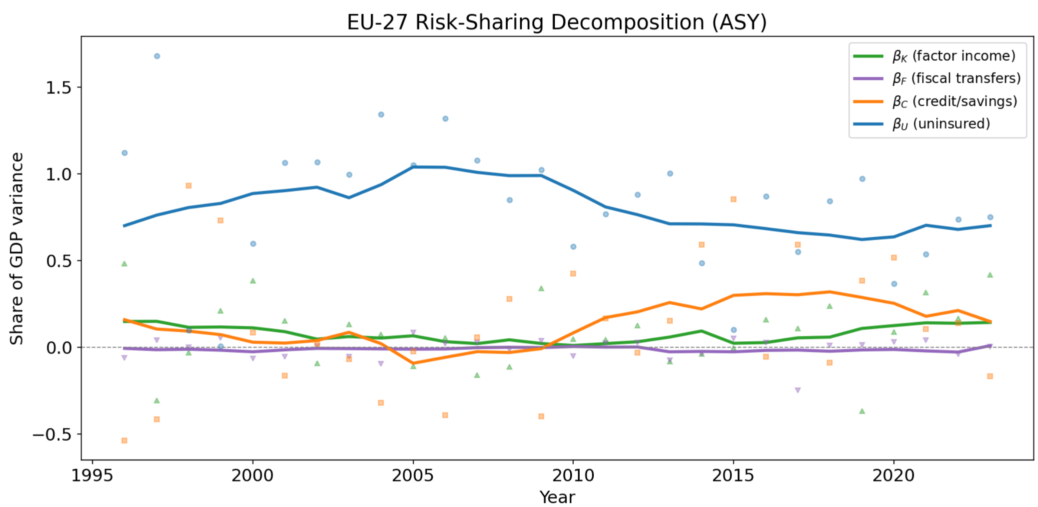
Period	β_K	β_F	β_C	β_U
1995–2023	0.06	0.00	0.08	0.86^{***}
	(0.04)	(0.01)	(0.10)	(0.13)
1995–2007	−0.01	0.01	-0.14^{*}	1.15^{***}
	(0.05)	(0.01)	(0.07)	(0.10)
2010–2019	0.03	−0.01	0.37^{**}	0.61^{***}
	(0.04)	(0.01)	(0.14)	(0.16)
2010–2023	0.09^{*}	−0.01	0.32^{*}	0.59^{***}
	(0.05)	(0.01)	(0.13)	(0.17)

Notes: OLS regressions with year fixed effects. Standard errors clustered by country in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Sample: 27 EU member states. Data: World Bank WDI.

Table 7 reports panel regression estimates of equation (9) for EU-27 countries using WDI data. The panel estimates confirm the variance-decomposition results: $\beta_U = 0.86$ for the full sample, with capital markets ($\beta_K = 0.06$) and fiscal transfers ($\beta_F = 0.00$) providing negligible smoothing.[11] The pre-GFC period (1995–2007) exhibits a negative credit-market channel ($\beta_C = -0.14$, marginally significant) and $\beta_U = 1.15$. The post-GFC decade brings marked improvement: β_C rises to 0.37 (significant at 5%), driving β_U down to 0.61. Including the COVID years barely changes the estimates ($\beta_U = 0.59$).

Figure 4 plots the year-by-year variance decomposition, showing the evolution of all four channels over time. The dominance of β_U is evident throughout the sample, but the post-GFC strengthening of β_C is clearly visible.

Figure 4: Variance Decomposition of EU Risk Sharing, 1996–2023



Notes: Year-by-year cross-sectional covariance decomposition: β_K (capital markets), β_F (fiscal transfers), β_C (credit markets), β_U (uninsured). Dots show annual estimates; lines show 10-year centered moving averages. By construction, $\beta_K + \beta_F + \beta_C + \beta_U = 1$ each year. The first year of WDI coverage (1995) is excluded due to extreme outliers from partial country coverage. Source: World Bank WDI.

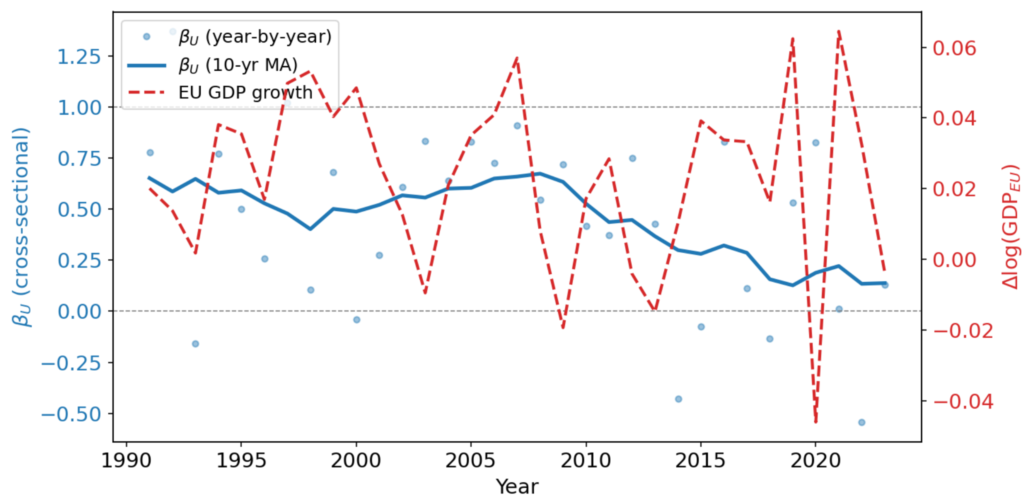
Several patterns stand out. First, EU risk sharing is dramatically lower than in the U.S.: over the full sample, 86% of GDP variance remains uninsured, compared to 22% for U.S. states. Second, the near-zero values of β_K and β_F indicate that cross-country factor income flows and EU-level fiscal transfers play essentially no role in smoothing GDP shocks—in sharp contrast to the U.S., where capital markets alone absorb 59% of output variance. Third, the pre-GFC period is notably worse than the full sample, with β_U exceeding unity, implying

[11] Ireland is an outlier because multinational profit shifting creates a large GDP–GNI wedge unrelated to risk sharing. Excluding Ireland leaves the pre-GFC estimates essentially unchanged but pushes β_K even closer to zero post-GFC ($0.03 \to -0.01$ for 2010–2019) and raises β_U ($0.61 \to 0.79$). The US–EU gap reported in the paper is therefore conservative.

that credit-market dynamics were actually amplifying consumption volatility relative to output. Fourth, risk sharing has improved markedly since the GFC, driven entirely by the credit-market channel, and this improvement is robust to the inclusion of COVID years.

Figure 5 plots the year-by-year cross-sectional $\beta_{U,t}$ estimates for the EU, using PWT 11.0 household consumption data (which extends back to 1991, providing a longer time series than the WDI). As in the U.S. case, the series is choppy—with only 27 countries per regression, the annual estimates are even noisier than those for U.S. states. Despite this noise, the 10-year moving average reveals a clear pattern: $\beta_{U,t}$ remains broadly in the 0.5–0.65 range from the early 1990s through the mid-2000s, and then declines steadily after the GFC, falling below 0.2 by the late 2010s. As in the U.S., the post-GFC improvement in risk sharing is clearly visible, confirming the panel regression results. Even at its lowest, however, the EU's smoothed $\beta_{U,t}$ remains well above the near-zero values reached by U.S. states—consistent with the dramatic gap documented in the variance decomposition.

Figure 5: Cross-Sectional β_U for EU-27 Countries, 1991–2023



Notes: Each point is the OLS coefficient from regressing $\Delta \log(C_i/C_{EU})$ on $\Delta \log(\text{GDP}_i/\text{GDP}_{EU})$ across 27 EU countries using household consumption. The solid line is a 10-year centered moving average. The dashed line shows EU-wide GDP growth (right axis). Source: Penn World Table 11.0.

5.3 The US–EU Gap: Comparison and Calibration

Table 8 presents the full four-channel comparison between U.S. and EU risk sharing using aligned sub-periods: pre-GFC (1996–2007 for the U.S., 1995–2007 for the EU) and post-GFC excluding the COVID years (2010–2019 for both).

Table 8: Risk Sharing: U.S. States vs. EU Countries

	Pre-GFC		Post-GFC	
	U.S.	EU	U.S.	EU
β_K (capital)	0.65***	−0.01	0.42***	0.03
β_F (fiscal)	0.07***	0.01	0.07***	−0.01
β_C (credit)	−0.15	−0.14*	0.36***	0.37**
β_U (uninsured)	0.43***	1.15***	0.15***	0.61***
Period	1996–2007	1995–2007	2010–2019	2010–2019

Notes: Panel OLS regressions with year fixed effects. Standard errors clustered by state (U.S.) or country (EU). U.S. data from BEA (50 states plus D.C.); EU data from World Bank WDI (27 member states). The 2008–2009 crisis years and 2020–2022 COVID years fall outside both sub-period windows. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The table reveals a striking contrast. In the pre-GFC period, U.S. states absorb roughly 57% of output fluctuations before they reach consumption ($\beta_U = 0.43$), while EU countries absorb almost nothing ($\beta_U = 1.15$, meaning consumption is even more volatile than output). The gap is driven almost entirely by capital markets ($\beta_K = 0.65$ vs. -0.01). The U.S. federal budget automatically redistributes income across states through progressive taxation and transfer programs ($\beta_F = 0.07$)—a channel that has no meaningful counterpart at the EU level. Notably, the credit-market channel is negative and similar in magnitude in both regions pre-GFC ($\beta_C = -0.15$ U.S. vs. -0.14 EU), suggesting that credit markets were amplifying rather than smoothing shocks in both regions during this period.

The post-GFC decade (2010–2019) shows convergence in one dimension and persistent divergence in another. The credit-market channel is now large and nearly identical: $\beta_C = 0.36$ in the U.S. and 0.37 in the EU, both highly significant. This likely reflects the deepening of credit markets and the institutional responses to the financial and sovereign debt crises. Yet capital-market smoothing remains a U.S.-only phenomenon ($\beta_K = 0.42$ vs. 0.03), and fiscal transfers likewise ($\beta_F = 0.07$ vs. -0.01). As a result, the overall gap persists: $\beta_U = 0.15$ in the U.S. versus 0.61 in the EU—a fourfold difference in the share of output risk left uninsured.

The persistence of the β_K gap is informative about the mechanism behind the corporate buffer. Using PWT 11.0 labor-share data to decompose GDP into compensation and gross operating surplus, we find that EU countries also exhibit procyclical profits: the cross-country elasticity of GOS to GDP is 1.26, compared to 1.55 for U.S. states.[12] Yet EU β_K is near zero. This confirms that procyclical profits alone do not generate capital-market smoothing; what matters is whether those profits accrue to geographically dispersed shareholders, as they do in the U.S. but not across EU borders.[13]

We now use the model from Section 2.3 to interpret these differences structurally.

Calibration

The decomposition of β_K in Section 3.3 directly disciplines the model parameters. We use the full-sample (1998–2022) estimates: $\beta_K = 0.49$ and $\beta_{\text{corp}} = 0.45$, intermediate between the pre- and post-GFC values in Table 3.[14] The model implies $\beta_{\text{corp}} = (\tilde{\alpha} - \alpha)/(1 - \alpha)$: the corporate buffer reflects the wedge between the marginal and average capital shares, scaled by the labor share.[15] With $\alpha = 0.38$ (the average gross operating surplus share of GSP) and $\beta_{\text{corp}} = 0.45$, this gives

$$\tilde{\alpha} \;=\; \alpha + (1-\alpha)\,\beta_{\text{corp}} \;=\; 0.38 + 0.62 \times 0.45 \;=\; 0.66.$$

That is, 66 cents of each marginal dollar of state output accrues to capital income, versus an average share of only 38%.

United States. The negligible earnings adjustment ($\beta_{\text{adj}} \approx 0$) implies $\lambda \approx 0$: labor-market integration plays essentially no role. With $\lambda = 0$, the identity $\beta_K = \mu\tilde{\alpha}$ pins down the

[12] The somewhat lower EU elasticity likely reflects institutional differences—centralized wage bargaining, employment protection—as well as measurement: PWT labor shares impute self-employment income, adding noise relative to BEA direct measurement.

[13] Section 5.3 formalizes this argument: the national ownership parameter μ determines the extent to which the corporate buffer translates into cross-border risk sharing. Data on international investment positions (Lane and Milesi-Ferretti 2007, 2018) confirm that cross-border equity holdings within the eurozone remain far below full diversification, consistent with $\mu \approx 0$.

[14] The full-sample $\beta_K = 0.49$ from the decomposition is smaller than the $\beta_K = 0.59$ reported in the main panel regressions (Table 2) because the decomposition sample starts in 1998 (when BEA earnings data become available), omitting the high-β_K years of the late 1980s and first half of the 1990s.

[15] Log-linearizing: $\Delta \log(Y_i/E_i) = \Delta \log Y_i - \Delta \log E_i$. Since $dE_i = (1-\tilde{\alpha})\,dY_i$ while $E = (1-\alpha)\bar{Y}$ at the steady state, $\Delta \log E_i = [(1-\tilde{\alpha})/(1-\alpha)]\,\Delta \log Y_i$, and $\beta_{\text{corp}} = 1 - (1-\tilde{\alpha})/(1-\alpha) = (\tilde{\alpha} - \alpha)/(1 - \alpha)$.

national ownership share:

$$\mu = \frac{\beta_K}{\tilde{\alpha}} = \frac{0.49}{0.66} = 0.74.$$

The model then predicts $\beta_{\text{prop}} = \phi - \beta_{\text{corp}} = 0.04$, close to the data (0.04). The degree of income diversification is $\phi = 0.49$, and the model predicts $\beta_U = 1 - \phi = 0.51$.

The calibrated $\mu = 0.74$ has an intuitive interpretation: roughly three-quarters of the marginal capital income generated by state-level shocks accrues to nationally diversified shareholders, while the remaining quarter stays with locally concentrated owners—small businesses, closely held firms, and real estate.

This stands in contrast to the traditional interpretation, in which the entire β_K was attributed to household portfolio diversification—requiring $\lambda = 0.48$ with $\alpha = 1/3$ to rationalize $\phi = 0.65$. Our decomposition shows that the mechanism is primarily *corporate*: nationally owned firms absorb local output shocks through their profit margins, and these profits accrue to a nationally diversified shareholder base.

European Union ($\beta_K \approx 0$). Income diversification is $\phi \approx 0$: virtually no income flows across national borders. The corporate buffer mechanism still operates *within* each country—French firms also have procyclical profit margins—but the shareholders are predominantly domestic. Setting $\lambda = 0$ (minimal cross-border labor mobility) and $\mu \approx 0$ (domestic ownership of corporate equity), the model correctly predicts $\beta_K \approx 0$ and $\beta_U = 1$. The US–EU gap in β_K is thus driven not by differences in profit cyclicality, but by *national versus domestic ownership* of the corporate sector.

The assumption $\mu \approx 0$ is supported by data on cross-border equity positions within the euro area. Using data on international investment positions, Lane and Milesi-Ferretti (2007, 2018) document that cross-border equity holdings within the eurozone remain far below what full diversification would imply, even after EMU eliminated currency risk and the post-GFC period spurred further financial integration. Euro area investors allocate the large majority of their equity portfolios to domestic assets—a home bias that persists even among EU members with fully integrated capital markets (Coeurdacier and Rey 2013). In the U.S., by contrast, publicly traded corporations are owned nationally through mutual funds, pension plans, and direct brokerage accounts, so $\mu \approx 0.74$ is readily achievable. The near-zero β_K in the EU data is thus consistent with the model: the corporate buffer operates domestically, but the absence of cross-border equity diversification prevents it from generating cross-country risk sharing.

The gap. The model predicts $\beta_U^{EU} - \beta_U^{US} = 1.00 - 0.51 = 0.49$. The data show $0.86 - 0.22 = 0.64$. Income diversification alone thus accounts for $0.49/0.64 = 77\%$ of the observed US–EU risk-sharing gap. The remaining 23% reflects the U.S. fiscal channel ($\beta_F = 0.08$ vs. 0.00) and other frictions.

6 Conclusion

This paper shows that the canonical capital-market channel in the Asdrubali et al. (1996) risk-sharing decomposition does not primarily reflect household portfolio diversification. Decomposing β_K for U.S. states, we find that 85–93% is driven by a corporate buffer: firms absorb local output shocks through their profit margins before they reach workers' earnings, and the residual accrues to nationally diversified shareholders. Property income diversification—the mechanism traditionally attributed to β_K—accounts for at most 16% of the total. Bartik instruments confirm that the buffer absorbs exogenous supply-driven shocks, and multi-horizon regressions show that about 55% of the one-year buffer persists permanently—consistent with genuine insurance through diversified ownership—while the rest dissipates within a few years as wages adjust.

These findings change the interpretation of a statistic that has been central to the macroeconomics of risk sharing for three decades. The channel enabling regional specialization (Kalemli-Özcan et al. 2003) and benefiting from banking deregulation (Demyanyk et al. 2007) is national corporate ownership, not household equity portfolios. Extending the analysis to 27 EU countries confirms that the fourfold US–EU risk-sharing gap is largely a gap in cross-border corporate integration; a simple model of income diversification accounts for three-quarters of this gap through differences in corporate ownership alone. For monetary unions lacking a central fiscal authority, the key margin for private stabilization is deeper cross-border corporate integration—as envisioned by the European Capital Markets Union—rather than broader household equity participation.

A Data

Replication code and data files for all empirical results in this paper are available from the authors upon request.

A.1 U.S. Data

Our U.S. data cover 50 states plus the District of Columbia from 1963 to 2022. The construction draws on six agencies: the Bureau of Economic Analysis (BEA), the Office of Management and Budget (OMB), the Federal Reserve (FRED), the U.S. Census Bureau, and the Bureau of Labor Statistics (via BEA). All monetary series are in millions of current dollars prior to deflation.

Gross State Product (GSP). For 1963–1996, GSP comes from the BEA's historical GDP-by-State tables (SIC basis). For 1997–2022, GSP is line 1 of the BEA regional account table SAGDP2 (available via the BEA regional data download page). The same SAGDP2 table provides nominal GDP by NAICS 2-digit industry for each state, which we use to construct the Bartik shift-share instrument in Section 4.1: base-year (1997) industry shares $\omega_{ij,0}$ interacted with leave-one-out national industry growth rates across 16 broad sectors.

State Income (SI). State income is constructed as

$$\begin{aligned} \text{SI} &= \text{PI} + \underbrace{\text{FedCorTax} + \text{FedTobTax} + \text{FedOthTax} + \text{Contr\_SI}}_{\text{federal non-personal taxes}} \\ &\quad + \underbrace{\text{SL\_TOT\_tax} - \text{SL\_per\_tax}}_{\text{S\&L non-personal taxes}} + \underbrace{\text{SL\_INT\_ins} + \text{SL\_INT\_misc} - \text{SL\_INT\_unemp}}_{\text{S\&L interest on funds}} \\ &\quad - \text{DirTrans}, \end{aligned}$$

where:

- **PI**—personal income: BEA SAINC50, line 10.
- **Property Income**: BEA SAINC40, line 90. Used only for allocating federal corporate taxes across states.

- **Federal taxes.** Aggregate federal corporate income tax, tobacco tax, and total excise tax come from OMB Historical Tables for 1963–2020, extended to 2021–2022 with FRED series FCTAX, B2002C1A027NBEA, and B234RC1A027NBEA. National totals are allocated to states as follows: corporate income tax by 50% personal-income shares and 50% property-income shares; tobacco tax by 50% personal-income shares and 50% population shares; other excise taxes (total excise minus tobacco) by personal-income shares.
- **Contr_SI**—contributions for government social insurance: BEA SAINC4, line 36.
- **S&L personal taxes**: BEA SAINC50, lines 120 + 180 + 230.
- **S&L total taxes, direct general expenditure, and interest items**: Census Bureau, Annual Survey of State and Local Government Finances. The specific items extracted are total taxes, direct general expenditure, interest on insurance trust funds (item X08), interest on miscellaneous funds, and state unemployment interest revenue (item Y02). Data for 1963–2008 come from the historical summary tables; for 2009–2022 from the annual summary tables and individual-unit files.
- **DirTrans**—total personal current transfer receipts: BEA SAINC35, lines 2000 + 3000.

Disposable State Income (DSI).

$$\text{DSI} = \text{SI} + \text{Fed\_Grants} + \text{FED\_TR} - \text{FED\_nonper\_tax} - \text{FED\_per\_tax},$$

where:

- **Fed_Grants**—federal grants to state governments: Census Bureau, Federal Aid to States.
- **FED_TR**—federal transfer receipts: BEA SAINC35, sum of lines 2100, 2200, 2300, 2400, 2500, 2600, and 3100, minus Medicaid (line 2221).
- **FED_per_tax**—federal personal current taxes: BEA SAINC50, line 70.

Consumption (C).

$$C = \text{PCE} + \text{SL\_TOT\_exp} - \text{SL\_TR},$$

where SL_TR = DirTrans − FED_TR captures state-and-local transfers, and SL_TOT_exp is direct general expenditure from the Census Government Finances data described above. State-level personal consumption expenditure (PCE) is constructed in two parts. For 1997–2022, state PCE comes from the BEA's regional PCE estimates, available via FRED/GeoFRED (series `{ST}PCE`, where `{ST}` is the two-letter state abbreviation). For 1963–1996, no official state PCE series exists; we follow Asdrubali et al. (1996) and use Census Bureau retail sales data by state, scaled so that the national total equals aggregate PCE from NIPA Table 2.5.5.

Population and deflation. State population is from BEA SAINC50, line 20. All per-capita series are deflated by the national PCE price index from NIPA Table 2.4.4.

A.2 European Data

Our primary EU data come from the World Bank World Development Indicators (WDI), covering 1995–2023. We download six series for each of the 27 current EU member states:

- **GDP:** Real GDP in constant 2015 US$ (`NY.GDP.MKTP.KD`).
- **GNI:** Real gross national income in constant 2015 US$ (`NY.GNP.MKTP.KD`).
- **GNI (nominal):** GNI in current US$ (`NY.GNP.MKTP.CD`), used to construct the implicit deflator.
- **Household consumption:** Real household final consumption in constant 2015 US$ (`NE.CON.PRVT.KD`).
- **Net secondary income:** Net current transfers in current US$ (`BN.TRF.CURR.CD`).
- **Population:** Total population (`SP.POP.TOTL`).

Gross national disposable income (GNDI) is constructed as $\text{GNDI}_{\text{real}} = \text{GNI}_{\text{real}} \times (1 + \text{net transfers}/\text{GNI}_{\text{nominal}})$, which implicitly deflates net transfers by the GNI deflator. The GDP, GNI, and consumption series are already in constant 2015 US$, so no additional deflation is required. Table 9 lists the countries included.

As a complement, we use the Penn World Table version 11.0 (Feenstra et al. 2015) for the year-by-year cross-sectional β_U regressions reported in Figure 5, covering 1991–2023 (after first-differencing). The key PWT variables are output-side real GDP (`cgdpo`), household consumption (`cgdpe` × `csh_c`), and population (`pop`), all in millions of constant 2017 US$.

Table 9: EU-27 Countries in Sample

Austria	Finland	Latvia	Romania
Belgium	France	Lithuania	Slovakia
Bulgaria	Germany	Luxembourg	Slovenia
Croatia	Greece	Malta	Spain
Cyprus	Hungary	Netherlands	Sweden
Czechia	Ireland	Poland	
Denmark	Italy	Portugal	

B Microfoundations for the Earnings Elasticity

B.1 General Framework

Consider location i with output Y_i and average capital share α. Define the *earnings elasticity* ρ as the short-run elasticity of local earnings with respect to local output:

$$\rho \;\equiv\; \frac{\partial \log E_i}{\partial \log Y_i}. \tag{13}$$

Under competitive factor markets with flexible wages and constant returns, $\rho = 1$: a 1% increase in output raises earnings by exactly 1%. In practice, several frictions can generate $\rho < 1$, so that earnings respond less than one-for-one to local output shocks.

When $\rho < 1$, the residual output change is absorbed by non-earnings income (corporate profits, depreciation, indirect business taxes). At the steady state where the earnings share is $(1 - \alpha)$, this implies a marginal capital share of

$$\tilde{\alpha} \;=\; 1 - (1 - \alpha)\,\rho. \tag{14}$$

The corporate buffer coefficient from Section 3.3 is

$$\beta_{\text{corp}} \;=\; \frac{\tilde{\alpha} - \alpha}{1 - \alpha} \;=\; 1 - \rho. \tag{15}$$

With $\beta_{\text{corp}} = 0.45$, we obtain $\rho = 0.55$ and $\tilde{\alpha} = 1 - 0.62 \times 0.55 = 0.66$. That is, 66 cents of each marginal dollar of state output accrues to capital income, versus an average share of only 38%.

B.2 Example 1: Predetermined Wages

Suppose output in location i is Cobb-Douglas with predetermined capital K_i and labor L_i:

$$Y_i = A_i \, K_i^{\alpha} \, L_i^{1-\alpha},$$

where A_i is a location-specific productivity shock. Wages are partially rigid: the local wage is a geometric average of a predetermined component $\bar{w}$ and the flexible competitive wage $w_i^* = (1-\alpha)\, Y_i / L_i$:

$$\log w_i \;=\; (1-\rho_w)\, \log \bar{w} \;+\; \rho_w \, \log w_i^*. \tag{16}$$

The parameter $\rho_w \in [0, 1]$ indexes wage flexibility: $\rho_w = 1$ is fully flexible, $\rho_w = 0$ is fully predetermined. Total earnings are $E_i = w_i \, L_i$, so

$$\frac{\partial \log E_i}{\partial \log Y_i} \;=\; \frac{\partial \log w_i}{\partial \log Y_i} \;=\; \rho_w.$$

Hence $\rho = \rho_w$, and the corporate buffer is $\beta_{\text{corp}} = 1 - \rho_w$. The data imply $\rho_w = 0.55$: wages adjust 55% toward their flexible-market level within the year. This is broadly consistent with the empirical literature on short-run wage rigidity, which finds that nominal wages adjust slowly to local labor market conditions.

B.3 Example 2: National Wage Setting

Alternatively, suppose all wages are flexible, but a fraction η of workers in location i are employed by national firms that set compensation based on aggregate rather than local conditions. These workers earn the national wage $\bar{w} = (1-\alpha)\bar{Y}/\bar{L}$, while the remaining fraction $(1-\eta)$ earn the local competitive wage $w_i^* = (1-\alpha)Y_i/L_i$. Total earnings in location i are

$$E_i \;=\; \left[(1-\eta)\, w_i^* + \eta\, \bar{w}\right] L_i.$$

Differentiating:

$$\frac{\partial \log E_i}{\partial \log Y_i} = (1-\eta)\,\frac{w_i^*}{w_i^* + \frac{\eta}{1-\eta}\bar{w}} = 1-\eta \quad \text{(at the symmetric steady state).}$$

So $\rho = 1-\eta$ and $\beta_{\text{corp}} = \eta$. The data imply $\eta = 0.45$: nearly half of local earnings come from nationally set compensation.

This mechanism is conceptually distinct from the labor-mobility parameter λ in the main text. Workers employed by national firms work *in* location i—their compensation is part of GSP_i. But their wages do not respond to local productivity shocks, so earnings track output less than one-for-one. By contrast, λ captures workers who physically commute or work remotely across state lines, so their earnings are part of a different state's GSP.

B.4 Discussion

The two examples are observationally equivalent at any single horizon: both deliver $\beta_{\text{corp}} = 1-\rho$ for the same ρ. However, they have different implications for the *horizon structure* of risk sharing. Wage rigidity (Example 1) provides temporary insurance that dissipates as wages adjust, whereas national wage setting (Example 2) provides permanent insurance that persists at all horizons. This distinction allows the multi-horizon evidence in Section 4.2 to partially decompose the two. The corporate buffer declines from $\beta_{\text{corp}} = 0.45$ at a one-year horizon to approximately 0.28 at five years, where it stabilizes. This suggests that about 60% of the buffer reflects permanent national wage setting ($\eta \approx 0.28$), while the remaining 40% reflects temporary wage rigidity that dissipates within 3–4 years. Each mechanism has different policy implications: wage rigidity is a market friction, while national wage setting by multi-state firms is an endogenous insurance arrangement. A sharper decomposition would require firm-level or establishment-level data—for example, testing whether wages at multi-state firms respond less to local shocks than wages at single-state firms.

C Supporting Evidence on the Corporate Buffer

The corporate buffer interpretation of β_{corp} relies on the premise that firms absorb output shocks through retained earnings before adjusting payouts to owners. We present two pieces of supporting evidence: a decomposition showing the buffer is driven by gross operating surplus rather than indirect taxes, and national data on the volatility of corporate dividends relative to profits.

C.1 Composition of the Corporate Buffer: GOS vs. Taxes

A natural concern is whether the corporate buffer reflects genuine profit-margin smoothing or merely the mechanical response of taxes on production and imports (TOPI). TOPI—which includes sales taxes, property taxes, and excise taxes—is a policy instrument rather than a corporate decision. To address this, we decompose the GSP-to-compensation wedge using the income-side identity from BEA table SAGDP1:

$$\text{GSP} \;=\; \underbrace{\text{Compensation}}_{\text{line 4}} + \underbrace{\text{GOS}}_{\text{line 5}} + \underbrace{\text{TOPI}_{\text{net}}}_{\text{line 6}}.$$

Defining $V \equiv \text{Compensation} + \text{GOS} = \text{GSP} - \text{TOPI}_{\text{net}}$, we decompose the total wedge between GSP and compensation into a TOPI channel and a GOS channel:

$$\underbrace{\Delta \log \text{GSP}_i - \Delta \log \text{Comp}_i}_{\beta_{\text{comp}}} \;=\; \underbrace{\Delta \log \text{GSP}_i - \Delta \log V_i}_{\beta_{\text{TOPI}}} \;+\; \underbrace{\Delta \log V_i - \Delta \log \text{Comp}_i}_{\beta_{\text{GOS}}},$$

where all variables are per capita relative to the U.S. aggregate and each β is estimated by OLS with year fixed effects and state-clustered standard errors.

Table 10 reports the results. Across all sub-periods, the TOPI channel is economically negligible and statistically insignificant: β_{TOPI} ranges from -0.00 to 0.03, accounting for less than 6% of the total wedge. The GOS channel accounts for 95–101% of the GSP-to-compensation wedge. This confirms that the corporate buffer is driven by profit-margin procyclicality—gross operating surplus absorbing output shocks—rather than by the tax system.

Note that β_{comp} (from SAGDP1: GSP $\rightarrow$ Compensation) exceeds β_{corp} (from SAINC4: GSP $\rightarrow$ Earnings) because earnings include proprietors' income, which is procyclical and absorbs part of the output shock. The SAGDP1 decomposition isolates the pure GOS-vs.-TOPI margin, while the SAINC4-based decomposition in Table 3 captures the full chain from GSP to state income.

Table 10: Decomposition of the GSP-to-Compensation Wedge: GOS vs. TOPI

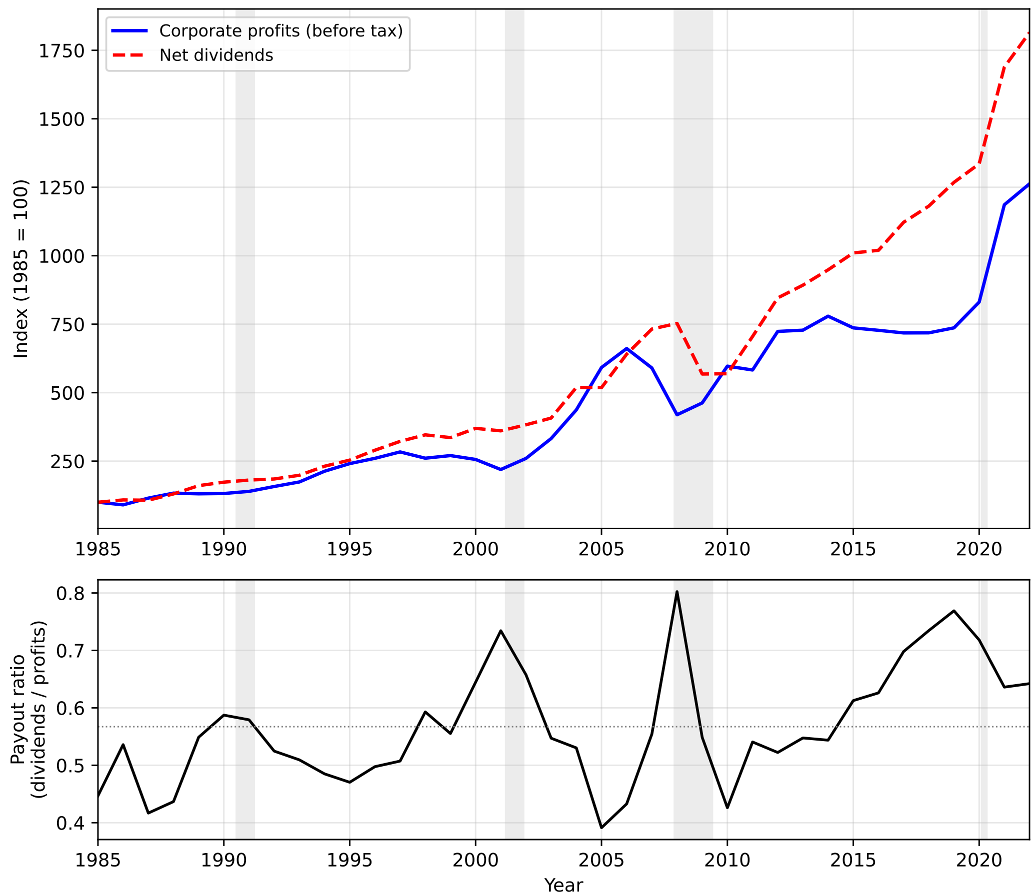
	Pre-GFC		Post-GFC	
Channel	Coeff.	Share	Coeff.	Share
β_{comp} (total: GSP $\rightarrow$ Comp)	0.59***		0.56***	
	(0.05)		(0.07)	
β_{TOPI} (tax smoothing)	−0.00	−1%	0.02	3%
	(0.02)		(0.03)	
β_{GOS} (profit-margin smoothing)	0.59***	101%	0.54***	97%
	(0.05)		(0.07)	

Notes: Panel OLS regressions with year fixed effects. Standard errors clustered by state in parentheses. Pre-GFC: 1998–2007; Post-GFC: 2010–2019. Sample: 51 states (50 states plus D.C.). The two sub-channels sum to β_{comp} by construction. Data: BEA SAGDP1 (lines 3–6) and SAINC4 (line 20 for population). TOPI_{net} = taxes on production and imports less subsidies, averaging 6.4% of GSP. Results are essentially unchanged when the year 2020 is excluded. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

C.2 Dividends vs. Profits at the National Level

Figure 6 plots U.S. corporate profits (before tax, with IVA and CCAdj) and net corporate dividends from 1985 to 2022, using NIPA data from FRED. Two features stand out. First, dividends are substantially smoother than profits: the standard deviation of annual log changes is 0.09 for dividends versus 0.14 for profits, a ratio of 0.67. Second, the payout ratio (dividends/profits) spikes during every recession as profits fall while dividends remain stable, consistent with the classic dividend-smoothing result of Lintner (1956). This aggregate pattern is the national counterpart of our state-level finding: because firms buffer profit shocks, state earnings (which are paid from "above the line") respond less than one-for-one to output shocks.

Figure 6: Corporate Profits and Dividends, 1985–2022



Notes: Top panel: levels indexed to 1985 = 100. Bottom panel: payout ratio (dividends/profits). Grey bands indicate NBER recession dates. Source: FRED (NIPA series A446RC1A027NBEA and B056RC1A027NBEA).

D Robustness

Table 11 reports three robustness checks for the main four-channel decomposition. Column (1) reproduces the baseline full-sample results from Table 2. Column (2) restricts the sample to 1997–2022, the period in which BEA provides direct state-level personal consumption expenditure data rather than the pre-1997 proxy based on retail sales. The results are quantitatively similar: $\beta_K = 0.54$, $\beta_U = 0.24$, and the credit-market channel is now significant at 5%. Column (3) reports population-weighted regressions, which upweight larger states. The capital-market channel remains dominant ($\beta_K = 0.57$), fiscal transfers are somewhat

Table 11: Robustness: U.S. Interstate Risk Sharing

	Baseline	Post-1997	Pop-weighted
β_K (capital)	0.59***	0.54***	0.57***
	(0.06)	(0.06)	(0.04)
β_F (fiscal)	0.08***	0.08***	0.11***
	(0.01)	(0.02)	(0.01)
β_C (credit)	0.11*	0.14**	0.06
	(0.06)	(0.06)	(0.07)
β_U (uninsured)	0.22***	0.24***	0.26***
	(0.05)	(0.08)	(0.08)
$N \times T$	1938	1326	1938
Period	1985–2022	1997–2022	1985–2022

Notes: OLS regressions with year fixed effects. Standard errors clustered by state in parentheses. Column (1) reproduces the full-sample row of Table 2. Column (2) restricts to years when BEA state-level PCE is directly measured rather than proxied by retail sales. Column (3) weights observations by state population. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Sample: 50 states plus the District of Columbia.

larger ($\beta_F = 0.11$), and the uninsured share is slightly higher ($\beta_U = 0.26$). Across all specifications, the core finding is robust: capital markets are the dominant smoothing channel, driven primarily by the corporate buffer.

References

Asdrubali, P., S. Kim, F. M. Pericoli, and P. Poncela (2023). Risk sharing channels in OECD countries: A heterogeneous panel VAR approach. *Journal of International Money and Finance 131*, 102804.

Asdrubali, P., B. E. Sørensen, and O. Yosha (1996). Channels of interstate risk sharing: United States 1963–1990. *Quarterly Journal of Economics 111*(4), 1081–1110.

Atkeson, A. and T. Bayoumi (1993). Do private capital markets insure regional risk? Evidence from the United States and Europe. *Open Economies Review 4*(3), 303–324.

Balli, F., c. Kalemli-Özcan, and B. E. Sørensen (2012). Risk sharing through capital gains. *Canadian Journal of Economics 45*(2), 472–492.

Bartik, T. J. (1991). *Who Benefits from State and Local Economic Development Policies?* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Borusyak, K., P. Hull, and X. Jaravel (2022). Quasi-experimental shift-share research designs. *Review of Economic Studies 89*(1), 181–213.

Cochrane, J. H. (1991). A simple test of consumption insurance. *Journal of Political Economy 99*(5), 957–976.

Coeurdacier, N. and H. Rey (2013). Home bias in open economy financial macroeconomics. *Journal of Economic Literature 51*(1), 63–115.

Crucini, M. J. (1999). On international and national dimensions of risk sharing. *Review of Economics and Statistics 81*(1), 73–84.

Demyanyk, Y., C. Ostergaard, and B. E. Sørensen (2007). U.S. banking deregulation, small businesses, and interstate insurance of personal income. *Journal of Finance 62*(6), 2763–2801.

European Commission (2015). Action plan on building a capital markets union. Com(2015) 468 final, European Commission, Brussels.

Feenstra, R. C., R. Inklaar, and M. P. Timmer (2015). The next generation of the Penn World Table. *American Economic Review 105*(10), 3150–3182.

Furceri, D. and A. Zdzienicka (2015). The Euro Area crisis: Need for a supranational fiscal risk sharing mechanism? *Open Economies Review 26*(4), 683–710.

Giroud, X. and H. M. Mueller (2019). Firms' internal networks and local economic shocks. *American Economic Review 109*(10), 3617–3649.

Guiso, L., L. Pistaferri, and F. Schivardi (2005). Insurance within the firm. *Journal of Political Economy 113*(5), 1054–1087.

Hagedorn, M. and I. Manovskii (2008). The cyclical behavior of equilibrium unemployment and vacancies revisited. *American Economic Review 98*(4), 1692–1706.

Hoffmann, M. and I. Shcherbakova-Stewen (2011). Consumption risk sharing over the business cycle: The role of small firms' access to credit markets. *Review of Economics and Statistics 93*(4), 1403–1416.

Kalemli-Özcan, Ş., B. E. Sørensen, and O. Yosha (2003). Risk sharing and industrial specialization: Regional and international evidence. *American Economic Review 93*(3), 903–918.

Lane, P. R. and G. M. Milesi-Ferretti (2007). The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004. *Journal of International Economics 73*(2), 223–250.

Lane, P. R. and G. M. Milesi-Ferretti (2018). The external wealth of nations revisited: International financial integration in the aftermath of the global financial crisis. *IMF Economic Review 66*(1), 189–222.

Lewis, K. K. (1999). Trying to explain home bias in equities and consumption. *Journal of Economic Literature 37*(2), 571–608.

Lintner, J. (1956). Distribution of incomes of corporations among dividends, retained earnings, and taxes. *American Economic Review 46*(2), 97–113.

Mace, B. J. (1991). Full insurance in the presence of aggregate uncertainty. *Journal of Political Economy 99*(5), 928–956.

Milano, V. (2017). Risk sharing in the Euro Zone: The role of European institutions. Working Papers CELEG 1701, LUISS Guido Carli.

Obstfeld, M. (1994). Are industrial-country consumption risks globally diversified? In L. Leiderman and A. Razin (Eds.), *Capital Mobility: The Impact on Consumption, Investment and Growth*. Cambridge: Cambridge University Press.

Sørensen, B. E. and O. Yosha (1998). International risk sharing and European monetary unification. *Journal of International Economics 45*(2), 211–238.