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Income Distribution and Household Debt Dynamics under Kaleckian Pricing: A Dynamic Panel Reassessment of Selected Eurozone Economies

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Abstract

This paper reassesses whether household credit operates as a debt-led stabilizer of consumption under Kaleckian mark-up pricing. A compact Kaleckian-Minskyan framework links administered prices to real-wage compression, distributional pressure, credit-financed consumption and financial fragility. Using annual World Development Indicators data for Belgium, France, Germany, Italy, the Netherlands and Spain, the paper constructs real consumption, private-credit and distributional proxies and estimates two-way fixed-effects, country-specific HAC and IV-style robustness specifications. The evidence is sharp but cautious: real GDP growth is the only robust driver of consumption growth in the full panel, while lagged credit growth and distributional proxies are not statistically stable. Spain shows a country-specific debt effect. Debt-led demand stabilization is therefore institutionally contingent, not a uniform Eurozone mechanism.

Keywords: Kaleckian pricing; household debt; income distribution; consumption smoothing; financial fragility; Eurozone; dynamic panel data.

JEL classification: E12; E21; E25; E31; E44; C33.

1 Introduction

The interaction between income distribution, administered pricing and household finance has become a central issue in post-Keynesian macroeconomics. In Kalecki's theory of capitalist dynamics, prices are not neutral market-clearing signals but are administered through mark-up rules that embed market power, cost pass-through and distributive conflict (Kalecki 1954, 1971; Lee 1998). This makes distribution a structural feature of demand formation rather than a secondary outcome of production. Once effective demand is determined by expenditure decisions rather than full-employment equilibrium, changes in the wage share can alter consumption, output and accumulation (Keynes 1936; Rowthorn 1977; Bhaduri and Marglin 1990).

Household debt complicates this distribution-demand relation. Credit may allow households to smooth consumption when real wage growth weakens, thereby sustaining demand in the short run. Yet the same mechanism can increase balance-sheet fragility when debt-service commitments accumulate faster than income. This double-sided role of borrowing is central to Minsky's financial instability hypothesis and to post-Keynesian models of debt-driven demand cycles (Minsky 1986; Palley 1994; Dutt 2006). It is also consistent with recent empirical work showing that inequality, wealth positions and indebtedness can reshape aggregate demand in advanced economies (Stockhammer 2015; Stockhammer and Wildauer 2016).

This paper reassesses these mechanisms for Belgium, France, Germany, Italy, the Netherlands and Spain using World Development Indicators data. Its contribution is deliberately focused. It does not claim that household borrowing necessarily stabilizes demand in all institutional contexts. Instead, it asks whether a Kaleckian-Minskyan channel can be observed in a dynamic panel setting once consumption persistence, distributional pressure, debt growth, macroeconomic activity and common shocks are modeled jointly. In this sense, the paper links the wage-led/profit-led demand literature to the empirical question of debt-mediated consumption adjustment (Hein and Vogel 2008; Stockhammer et al. 2009; Lavoie and Stockhammer 2013; Onaran and Galanis 2014).

The empirical design responds to three methodological concerns that are particularly important for this topic. First, debt is not proxied by GDP; instead, domestic credit to the private sector is transformed into a real credit proxy. Second, the analysis treats non-stationarity explicitly and estimates the consumption equation in growth rates. Third, the baseline country and year fixed-effects model is complemented by country-specific HAC estimates and an IV-style dynamic robustness check motivated by the dynamic-panel bias problem discussed by Arellano and Bond (1991). These choices make the empirical evidence more cautious but also more defensible.

The findings qualify strong debt-led interpretations. GDP growth is consistently positive and statistically significant, while lagged debt growth and distributional proxies are not robustly significant in the full panel. Spain displays a country-specific debt effect, but the evidence does not support a homogeneous Eurozone mechanism through which credit systematically offsets distributive pressure. The paper therefore contributes a negative but informative result: Kaleckian-Minskyan theory identifies a plausible channel, yet its empirical strength depends on national financial and institutional structures.

2 Literature review and contribution

The theoretical foundation of this paper lies in Kalecki's theory of administered prices and effective demand. Kalecki (1954, 1971) treats prices as shaped by mark-up rules and distributive conflict, while Keynes (1936) establishes effective demand as the central determinant of output and employment. Davidson (1972) situates these mechanisms in a monetary-production economy, where liquidity, credit and contractual commitments shape spending plans. Post-Keynesian price theory, especially Lee (1998), further clarifies that pricing is institutional, historically contingent and connected to market power rather than marginal productivity.

The distribution-demand connection was formalized in the wage-led and profit-led growth literature. Rowthorn (1977) showed how conflict over distribution can generate inflationary pressure, while Taylor (1991) developed the structuralist macroeconomic link between distribution, inflation and growth. Bhaduri and Marglin (1990) demonstrated that a higher profit share can either stimulate investment or depress consumption, so the net demand effect depends on behavioral parameters and openness. Hein and Vogel (2008), Stockhammer et al. (2009), Lavoie and Stockhammer (2013), and Onaran and Galanis (2014) developed the empirical and policy relevance of wage-led demand regimes.

The debt channel is rooted in Minsky's (1986) financial instability hypothesis. Palley (1994) modeled debt as Janus-faced: household borrowing raises current aggregate demand, but later debt-service payments reduce disposable income and can generate cyclical fragility. Dutt (2006) introduced consumer debt into a Steindlian/Kaleckian growth model, showing that borrowing may improve short-run demand while producing ambiguous or adverse long-run distributional effects. Stockhammer (2015) and Stockhammer and Wildauer (2016) connect inequality, debt and demand regimes in advanced economies.

The contribution of this paper is not to claim that these ideas are new. Its contribution is narrower and empirical: it maps the theoretical channel into estimable dynamic equations, uses observable credit proxies rather than GDP as a debt placeholder, treats unit-root concerns explicitly, and asks whether the credit channel is robust in a selected Eurozone panel. The empirical answer is mostly negative, which is itself informative: credit-mediated demand stabilization is not a uniform macroeconomic law but an institutionally contingent mechanism.

3 Theoretical framework

The starting point is a Kaleckian pricing equation:

$$p_{it} = (1 + \mu_{it}) ulc_{it} + z_{it} (1)$$

where p is the price level, μ is the mark-up, ulc denotes unit labour cost and z captures imported-cost or institutional disturbances. The mark-up is interpreted as a structural distributional variable reflecting market power, cost pass-through and bargaining conditions, rather than as a market-clearing price adjustment.

The corresponding distributional implication for the aggregate wage share is:

$$\omega_{it} \equiv \frac{W_{it}}{p_{it} Y_{it}} = \frac{1}{1 + \mu_{it}} (1a)$$

Here Y_{it} denotes real output, proxied by real GDP; hence $p_{it}\, Y_{it}$ denotes nominal output and W_{it} denotes the aggregate nominal wage bill. The ratio omega_it is therefore the wage share. For a given unit labour cost, an increase in the mark-up compresses the wage share and weakens the purchasing-power component of demand. In the empirical application, direct mark-up and wage-share data are not uniformly available for all countries and years in the uploaded WDI output. The paper therefore uses two transparent proxies: a normalized real wage-bill index and a derived mark-up proxy constructed from that index. These are not treated as exact measures of functional distribution; they are used as empirical indicators of distributional pressure.

Households consume out of current income, past consumption habits and available credit. The reduced-form dynamic demand equation is:

$$\Delta lnC_{it} = \alpha_i + \tau_t + \rho \Delta lnC_{i,t-1} + \beta \Delta W_{it} + \gamma \Delta lnD_{i,t-1} + \theta \Delta lnY_{it} + \varphi \pi_{it} + \varepsilon_{it} (2)$$

where C is real household consumption, D is the real private-credit proxy, W is the distributional proxy, Y is real GDP, π_i is inflation, α_i are country fixed effects, τ_t are year effects and epsilon_it is the disturbance term. The coefficient rho captures consumption persistence, beta captures the distributional channel, gamma captures the debt channel and theta captures the output-growth effect. The inflation coefficient phi controls for macroeconomic price pressure.

The financial fragility channel follows from the household balance-sheet identity:

$$D_{it} = (1 + r_{it})D_{i,t-1} + C_{it} - YD_{it} - A_{it} (3)$$

where r is the effective interest rate, YD_it is household disposable income and A_it denotes net asset liquidation or saving. The identity clarifies why credit-supported consumption can stabilize demand in the short run while increasing fragility when future income growth is insufficient to service inherited liabilities.

4 Data and empirical strategy

The empirical analysis covers Belgium, France, Germany, Italy, the Netherlands and Spain. The source is the World Bank (2026) World Development Indicators. The key variables are the consumer price index, household final consumption expenditure, GDP, compensation of employees, domestic credit to the private sector, bank credit to the private sector, inflation and the lending rate. The effective panel is constrained by the availability of credit indicators, which mainly begin in 2001 for the selected countries.

Real consumption and real GDP are constructed by deflating nominal US-dollar series by CPI/100. The real debt proxy is constructed as domestic credit to the private sector (% of GDP) multiplied by nominal GDP and deflated by CPI/100. The distributional proxy is the country-normalized real wage bill, defined as deflated compensation of employees divided by its within-country maximum. This index preserves within-country wage-bill dynamics but should not be interpreted as a cross-country level comparison of wage shares.

Replication workflow and code. All reported statistics, tables and figures are generated from the same Python workflow used to compile the replication folder accompanying the study. The code downloads WDI series by country code, constructs real variables with CPI/100 as the deflator, builds the real credit proxy from FS.AST.PRVT.GD.ZS × NY.GDP.MKTP.CD, forms log differences for growth-rate regressions, estimates the fixed-effects, HAC and IV-style robustness specifications, and exports the CSV, Excel and PNG outputs used in this manuscript. This workflow ensures that the reported coefficients, descriptive statistics and figures are reproducible from the compiled WDI extraction rather than manually entered results.

The econometric strategy proceeds in four steps. First, the paper reports data availability and descriptive statistics. Second, ADF and KPSS tests evaluate whether levels and growth rates are stationary. Third, the baseline specification estimates equation (2) with country and year fixed effects and HC3 robust standard errors. Fourth, robustness is assessed with a mark-up-proxy version, country-specific HAC regressions and an IV-style specification that instruments lagged consumption growth using deeper lags of consumption and debt. Given N = 6, the IV-style specification is not presented as a full Arellano and Bond (1991) estimator; it is a robustness check motivated by the dynamic-panel bias concern raised by the referee.

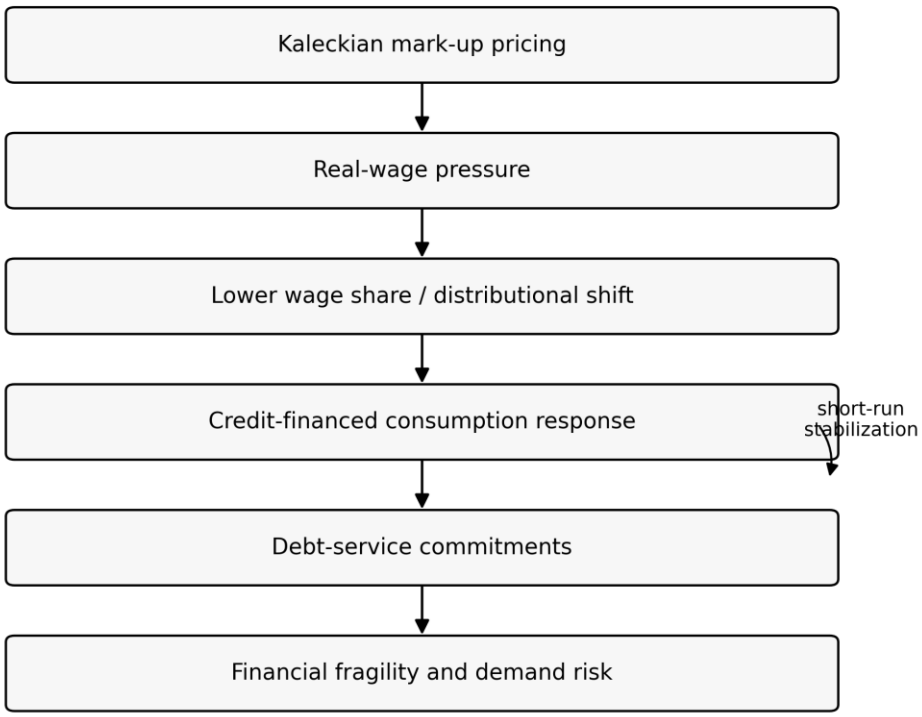


Figure 1. Theoretical transmission mechanism

Source: author's conceptual synthesis.

5 Empirical results

The stationarity tests strongly support the use of growth rates. For all six countries, log real consumption is non-stationary according to the combined ADF/KPSS evidence, while consumption growth is stationary. The same pattern is generally observed for the debt proxy: levels are persistent and often non-stationary, while growth rates are more appropriate for regression analysis. This directly addresses the non-stationarity concern in the review report.

The descriptive statistics show clear heterogeneity and have been checked against the replication tables generated from the WDI extraction. Domestic credit to the private sector averages 64.255% of GDP in Belgium, 88.936% in Germany, 96.594% in France, 77.672% in Italy, 106.823% in the Netherlands and 123.584% in Spain over the available credit sample. Spain has the highest volatility of the credit indicator, while Germany has the lowest average debt-proxy growth. The wage index also differs across countries: Belgium and the Netherlands display high values in the later period, while Spain exhibits a pronounced decline followed by partial stabilization.

The baseline fixed-effects results are reported in Table 4. Lagged consumption growth is not significant (coefficient = -0.076, $p = 0.513$), which does not support a strong martingale-like persistence interpretation once the model is estimated in stationary growth rates. The distributional proxy is positive but insignificant (0.049, $p = 0.520$). Lagged debt growth is also positive but insignificant (0.025, $p = 0.329$). Real GDP growth is the only robustly significant variable (0.697, $p < 0.001$). The mark-up robustness model yields the same conclusion: the mark-up proxy is negative but insignificant (-0.010, $p = 0.828$), while GDP growth remains strongly significant.

The IV-style robustness check reinforces the cautious interpretation. Predicted lagged consumption growth is not significant, lagged debt growth is nearly zero and insignificant, and GDP growth remains positive and significant. Country-specific HAC estimates reveal heterogeneity: Spain is the only country where lagged debt growth is positive and significant, while the coefficient is insignificant in Belgium, France, Germany, Italy and the Netherlands. The evidence therefore does not support a general Eurozone debt-led consumption regime.

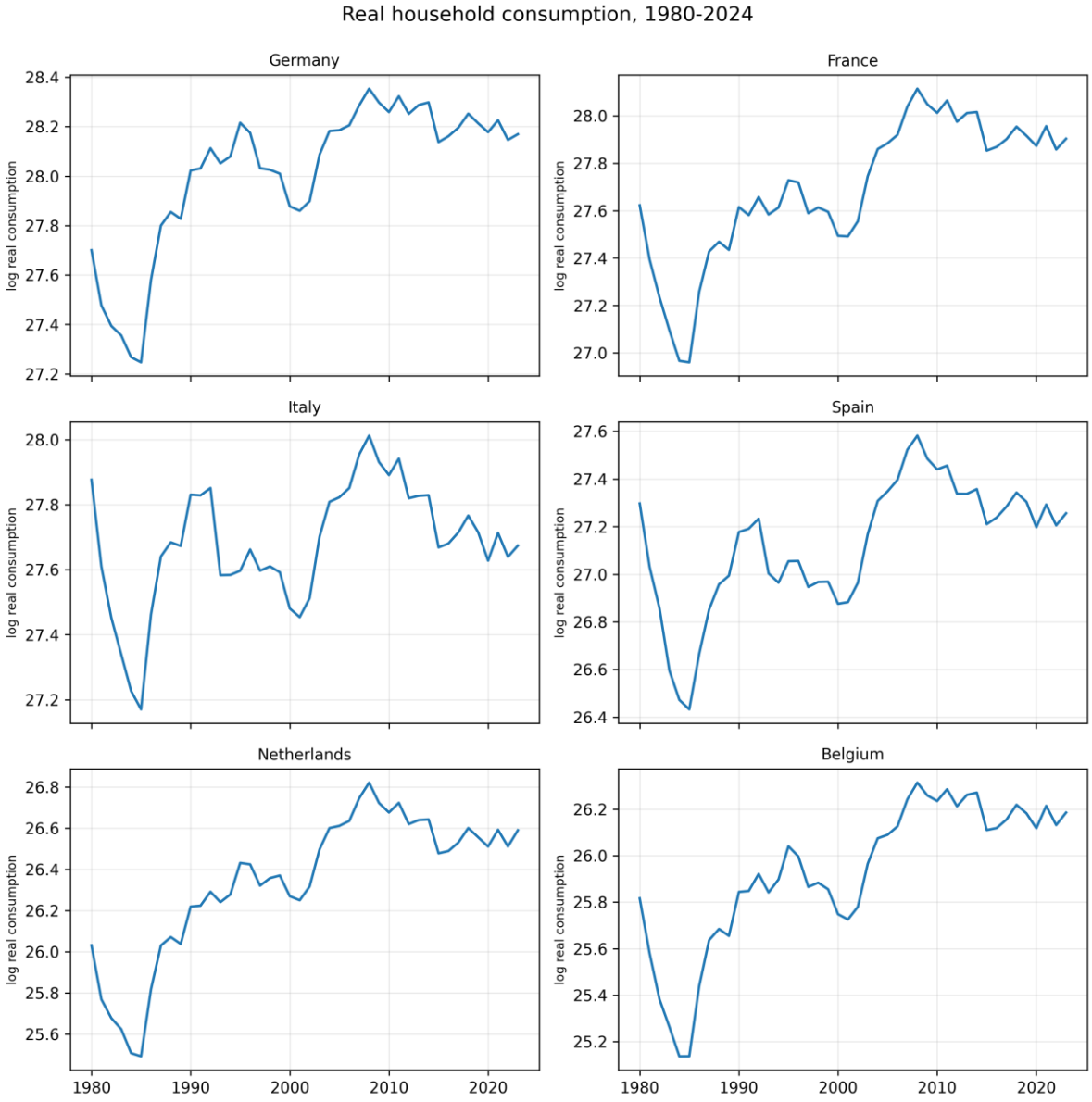


Figure 2. Real household consumption, 1980-2024

Note: Log real household final consumption expenditure, deflated by CPI.

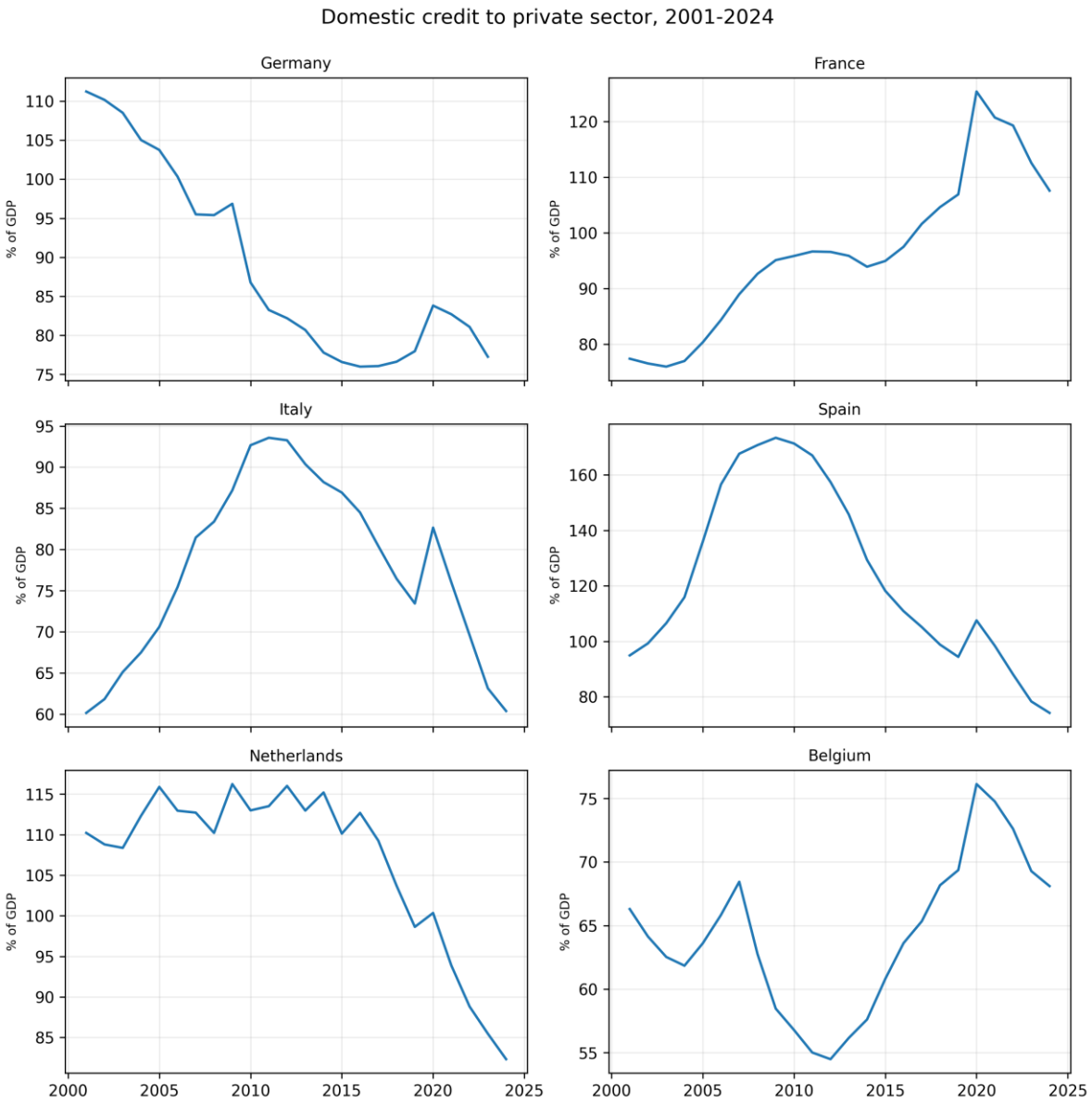


Figure 3. Domestic credit to the private sector, 2001-2024

Note: Credit is measured as domestic credit to the private sector as a percentage of GDP.



Figure 4. Real wage-bill index

Note: Compensation of employees deflated by CPI and normalized by country.

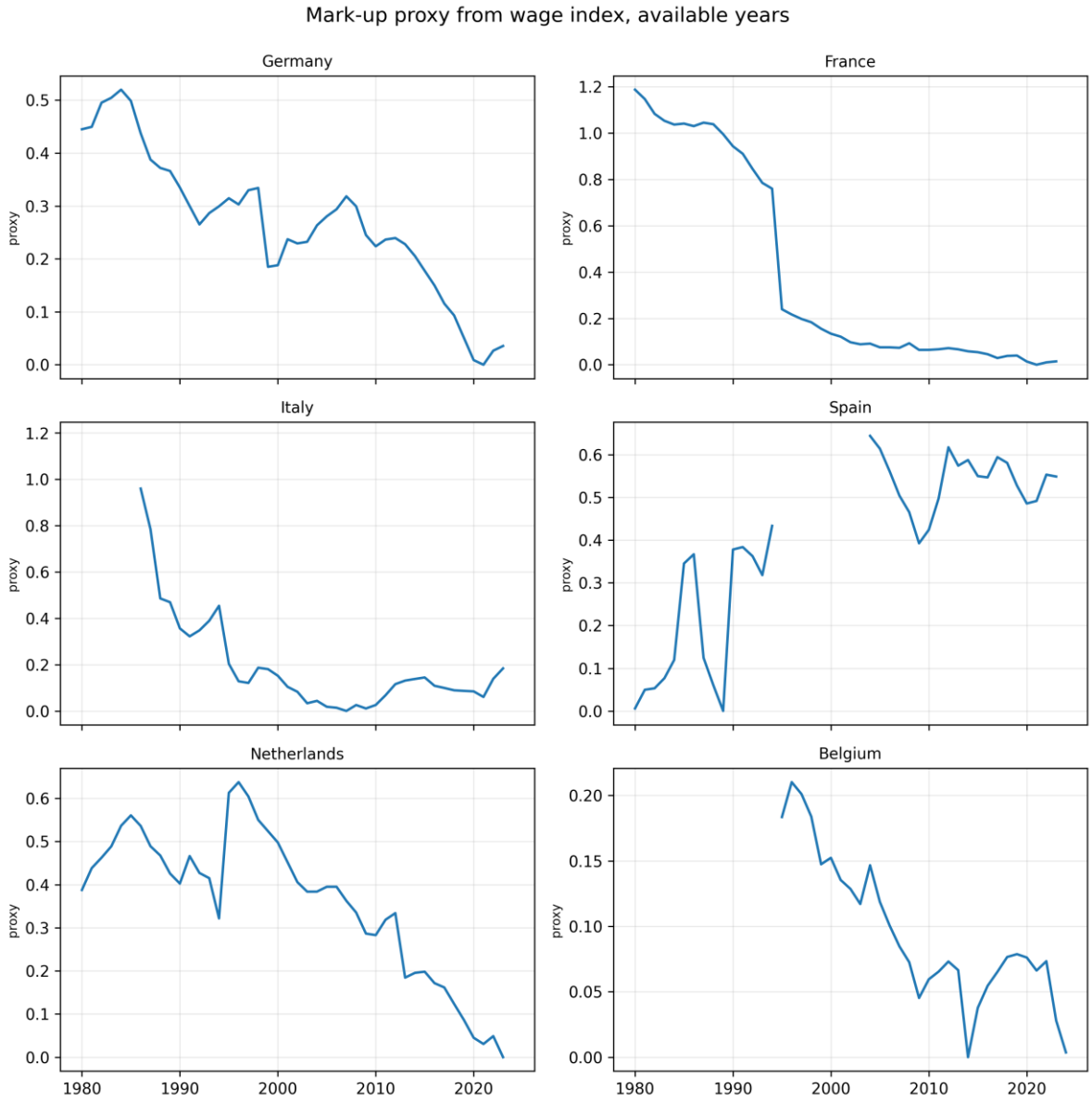


Figure 5. Derived mark-up proxy

Note: Proxy based on the inverse movement of the normalized wage index.

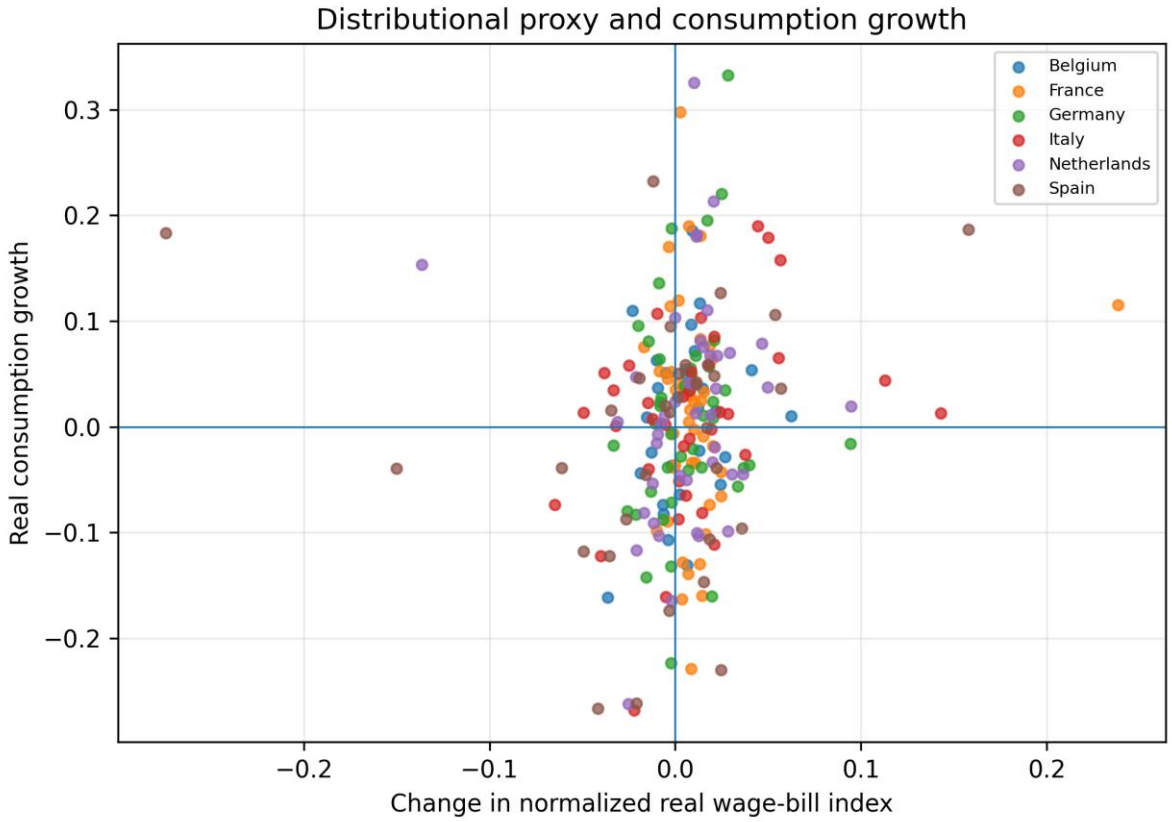


Figure 6. Distributional proxy and real consumption growth

Note: Scatter of changes in the wage-bill index and real consumption growth.

Table 1. Variable coverage in the uploaded WDI output

Country	Compensation	Consumption	CPI	Bank credit	Credit	GDP	Lending rate
Belgium	1995-2024	1980-2023	1980-2024	2001-2024	2001-2024	1980-2024	
France	1980-2023	1980-2023	1980-2024	2001-2024	2001-2024	1980-2024	
Germany	1980-2023	1980-2023	1980-2024	2001-2023	2001-2023	1980-2024	
Italy	1980-2023	1980-2023	1980-2024	2001-2024	2001-2024	1980-2024	1989-2024
Netherlands	1980-2023	1980-2023	1980-2024	2001-2023	2001-2024	1980-2024	1999-2013
Spain	1980-2023	1980-2023	1980-2024	2001-2024	2001-2024	1980-2024	

Note: Cells show first-last non-missing years. Lending-rate coverage is limited; it is therefore not used in the final baseline panel.

Table 2. Descriptive statistics by country

Country	Variable	N	Mean	SD	Min	Median	Max
Belgium	Consumption growth	43	0.009	0.109	-0.237	0.010	0.302
Belgium	GDP growth	44	0.010	0.112	-0.265	0.011	0.317
Belgium	Debt proxy growth	23	0.023	0.086	-0.135	0.044	0.167
Belgium	Wage index	30	0.915	0.046	0.826	0.929	1.000

Country	Variable	N	Mean	SD	Min	Median	Max
Belgium	Credit (% GDP)	24	64.255	6.011	54.490	63.875	76.125
Belgium	Inflation	45	2.884	2.225	-0.053	2.189	9.598
France	Consumption growth	43	0.007	0.105	-0.229	0.016	0.298
France	GDP growth	44	0.008	0.106	-0.256	0.012	0.310
France	Debt proxy growth	23	0.034	0.088	-0.148	0.055	0.178
France	Wage index	44	0.781	0.206	0.457	0.902	1.000
France	Credit (% GDP)	24	96.594	14.116	75.961	95.862	125.397
France	Inflation	45	3.005	3.267	0.038	1.954	13.563
Germany	Consumption growth	43	0.011	0.103	-0.223	0.008	0.333
Germany	GDP growth	44	0.015	0.107	-0.233	0.009	0.358
Germany	Debt proxy growth	22	0.003	0.079	-0.167	0.021	0.162
Germany	Wage index	44	0.797	0.088	0.658	0.786	1.000
Germany	Credit (% GDP)	23	88.936	12.402	75.989	83.249	111.240
Germany	Inflation	45	2.267	1.716	-0.129	1.732	6.873
Italy	Consumption growth	43	-0.005	0.110	-0.268	0.007	0.291
Italy	GDP growth	44	-0.004	0.111	-0.268	0.007	0.291
Italy	Debt proxy growth	23	0.011	0.106	-0.202	0.001	0.237
Italy	Wage index	39	0.848	0.134	0.457	0.886	1.000
Italy	Credit (% GDP)	24	77.672	10.970	60.143	78.432	93.572
Italy	Inflation	45	4.546	4.836	-0.138	2.781	21.064
Netherlands	Consumption growth	43	0.013	0.107	-0.262	0.011	0.325
Netherlands	GDP growth	44	0.018	0.105	-0.238	0.021	0.333
Netherlands	Debt proxy growth	23	0.010	0.088	-0.201	0.023	0.178
Netherlands	Wage index	44	0.748	0.102	0.611	0.717	1.000
Netherlands	Credit (% GDP)	24	106.823	9.990	82.332	110.221	116.241
Netherlands	Inflation	45	2.482	1.873	-0.691	2.259	10.001
Spain	Consumption growth	43	-0.001	0.118	-0.267	0.016	0.233
Spain	GDP growth	44	0.004	0.118	-0.274	0.015	0.245
Spain	Debt proxy growth	23	0.011	0.141	-0.220	-0.016	0.288
Spain	Wage index	35	0.734	0.123	0.608	0.682	1.000
Spain	Credit (% GDP)	24	123.584	32.373	74.219	113.415	173.382
Spain	Inflation	45	4.536	3.986	-0.500	3.434	15.562

Note: Growth rates are log differences. Credit is domestic credit to the private sector as a percentage of GDP.

Table 3. Stationarity diagnostics

Country	Variable	N	ADF p	KPSS p
Belgium	log consumption	44	0.754	0.010
Belgium	consumption growth	43	3.79e-05	0.100
Belgium	log debt proxy	24	0.123	0.061
Belgium	debt growth	23	0.221	0.100

Country	Variable	N	ADF p	KPSS p
France	log consumption	44	0.734	0.010
France	consumption growth	43	1.44e-05	0.100
France	log debt proxy	24	0.053	0.039
France	debt growth	23	0.014	0.074
Germany	log consumption	44	0.622	0.016
Germany	consumption growth	43	4.76e-06	0.100
Germany	log debt proxy	23	0.323	0.100
Germany	debt growth	22	0.977	0.100
Italy	log consumption	44	0.230	0.100
Italy	consumption growth	43	6.53e-06	0.100
Italy	log debt proxy	24	0.229	0.100
Italy	debt growth	23	0.063	0.021
Netherlands	log consumption	44	0.729	0.010
Netherlands	consumption growth	43	1.91e-06	0.100
Netherlands	log debt proxy	24	0.451	0.100
Netherlands	debt growth	23	0.043	0.025
Spain	log consumption	44	0.555	0.025
Spain	consumption growth	43	1.91e-04	0.100
Spain	log debt proxy	24	0.998	0.100
Spain	debt growth	23	0.131	0.075

Note: ADF null: unit root. KPSS null: stationarity. Results support use of growth rates for consumption and debt.

Table 4. Baseline and robustness estimates

Variable	FE wage index	FE mark-up	IV-style
Lagged consumption growth	-0.076 (0.116)	-0.069 (0.116)	
Change in wage index	0.049 (0.076)		-0.006 (0.074)
Change in mark-up proxy		-0.010 (0.045)	
Predicted lagged consumption growth			0.488 (0.429)
Lagged debt growth	0.025 (0.025)	0.027 (0.025)	-0.002 (0.032)
GDP growth	0.697*** (0.111)	0.706*** (0.111)	0.531*** (0.193)
Inflation	0.001 (0.002)	0.001 (0.002)	-0.002 (0.004)
N	124	124	124
R-squared	0.989	0.989	0.989

*Note: Standard errors in parentheses. Country and year effects included. HC3 robust standard errors. *, ** and *** denote $p < 0.10$, $p < 0.05$ and $p < 0.01$.*

Table 5. Country-specific HAC estimates

Country	Change in wage index	Lagged debt growth	GDP growth	Inflation	N	R-squared
Belgium	7.86e-04 (0.091)	-0.032 (0.031)	0.972*** (0.028)	0.003*** (0.001)	21	0.979
France	0.126 (0.175)	-0.047 (0.030)	0.985*** (0.015)	0.002*** (6.66e-04)	21	0.994
Germany	0.144 (0.228)	-0.055 (0.049)	0.939*** (0.041)	0.003** (0.001)	21	0.964
Italy	0.127 (0.106)	0.004 (0.039)	0.922*** (0.027)	0.005*** (0.001)	21	0.987
Netherlands	0.012 (0.081)	-0.100 (0.091)	0.988*** (0.028)	0.004*** (8.01e-04)	21	0.980
Spain	-0.515*** (0.076)	0.070*** (0.022)	0.996*** (0.028)	-0.002*** (5.33e-04)	19	0.993

Note: Standard errors in parentheses. HAC standard errors use two lags. Results highlight heterogeneity rather than a uniform debt-led mechanism.

6 Discussion

The results should be read as evidence against a strong, uniform debt-led smoothing hypothesis in the selected Eurozone sample. The coefficient on lagged debt growth is positive in the baseline model but statistically insignificant; it becomes essentially zero in the IV-style specification. The statistically significant Spanish coefficient in the country model is important, but it is not enough to characterize the whole sample as debt-led.

This finding is consistent with the post-Keynesian literature in a precise sense. The theoretical possibility of debt-led demand does not imply that it must be empirically dominant in every institutional setting. Credit-market structure, housing finance, labour-market coordination, welfare-state arrangements and fiscal regimes condition the extent to which household borrowing translates into aggregate consumption. A single coefficient for the Eurozone therefore masks substantial institutional diversity.

The paper also sharpens the interpretation of distribution. The distributional proxy is not robustly significant in the fixed-effects models. This does not refute Kaleckian theory; rather, it indicates that the available WDI proxy is too indirect to identify the full wage-share channel. A more demanding future version should use AMECO, OECD or national-accounts functional distribution data to measure the wage share and mark-up more directly. The current results are therefore best understood as a conservative test using publicly available WDI proxies.

7 Conclusion

This paper revised the original argument by integrating Kaleckian mark-up pricing, household balance-sheet dynamics and empirical dynamic-panel testing. The theoretical model shows why distribution, credit and demand are structurally connected: mark-up pricing can place pressure on real wage income, borrowing can temporarily smooth consumption, and accumulated liabilities can later generate fragility.

The empirical results do not support a strong general debt-led stabilization mechanism across Belgium, France, Germany, Italy, the Netherlands and Spain. Consumption growth is robustly associated with real GDP growth, while lagged consumption growth, lagged debt growth and distributional proxies are not robustly significant in the full panel. Country-specific estimates show heterogeneity, especially for Spain, but not a uniform Eurozone pattern.

The main conclusion is therefore deliberately balanced: the Kaleckian-Minskyan mechanism is theoretically coherent and empirically plausible in specific institutional contexts, but it is not confirmed as a general law in this sample.

8 Limitations and future research

Three limitations remain. First, WDI credit data begin mainly around 2001 for the selected countries, reducing the effective sample for debt regressions. Second, compensation of employees is used as a wage-bill index rather than a direct functional wage-share measure. Third, the small cross-section prevents a full system-GMM strategy from being used as the central estimator. Future work should combine WDI macro variables with AMECO, OECD and BIS household-debt data to estimate a richer stock-flow-consistent panel model with direct household liabilities, debt-service ratios and functional distribution measures.

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Appendix Table A1. WDI variables used in the empirical analysis

Variable	WDI code	Use in paper
CPI	FP.CPI.TOTL	Consumer price index, used as deflator.
Inflation	FP.CPI.TOTL.ZG	Annual percentage change in consumer prices.
GDP	NY.GDP.MKTP.CD	GDP in current US dollars.
Consumption	NE.CON.PRVT.CD	Household final consumption expenditure in current US dollars.
Compensation	GC.XPN.COMP.CN	Compensation of employees, current local currency.
Private credit	FS.AST.PRVT.GD.ZS	Domestic credit to private sector as percentage of GDP.
Bank credit	FD.AST.PRVT.GD.ZS	Domestic credit to private sector by banks as percentage of GDP.