Labor Rigidity and the Dynamics of the Value Premium*

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[This draft includes the Online Appendix]

Abstract

This paper documents that (i) the labor-share is a strong predictor of both the value and duration premia, (ii) these premia are highly correlated, and (iii) the labor-share does not forecast the component of the value premium orthogonal to the duration premium. A simple equilibrium model with labor rigidity and heterogeneity in cash-flow durations rationalizes these stylized facts. The economic channel is a term-structure effect: labor rigidity boosts short-run dividend risk because wages are more responsive to permanent than transitory shocks. This leads to downward-sloping equity risk and to a cross-sectional duration premium. In turn, value firms earn a compensation over growth firms which is predicted by labor-share variation.

Keywords: value premium, labor rigidity, term-structure, predictability, duration
JEL Classification: D51, E21, G12

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1 Introduction

The value premium, since Graham and Dodd (1934), is usually defined as the excess return of firms with low price relative to fundamentals (value) over firms with high price relative to fundamentals (growth). Actual data suggests that the value premium is positive and sizeable. This stylized fact is puzzling because, as shown by Fama and French (1992) among others, standard asset pricing models (e.g. CAPM) cannot account for the value premium. Moreover, there is still no conclusive consensus in the literature about the macroeconomic foundation of the value premium (Clementi and Palazzo, 2015) and its time-series dynamics, which is the core of the present paper.

The contribution of the paper is twofold. First, I document three facts: (i) labor rigidity measured by labor-share variation largely forecasts the value premium at business cycle frequency, (ii) a similar pattern of predictability obtains also for the duration premium (i.e., the excess return of shorter cash-flow duration firms over longer cash-flow duration firms), and (iii) the labor-share does not forecast the component of the value premium orthogonal to the duration premium. Second, I rationalize these facts through a simple equilibrium model with labor rigidity and heterogeneity in cash-flow durations. Labor rigidity smooths wages but shifts dividend risk towards the short horizon and leads to downward-sloping term-structure of equity (van Binsbergen, Brandt, and Koijen, 2012). Hence, positive duration and value premia obtain and have dynamics predicted by labor-share variation.

The rationale beyond the model mechanism is the following. Labor rigidity –due to either bargaining negotiations or infrequent wage resettling or search and other frictions– leads to an explicit or implicit income insurance from shareholders to workers which takes places within the firm (Berk and Walden, 2013).[1] Thus, the labor-share has counter-cyclical dynamics and, in turn, firm profits and shareholders' remuneration become more pro-cyclical and volatile. Such a *labor leverage* provides a rationale for a high equity compensation (Danthine and Donaldson, 2002). Beyond labor leverage, Marfè (2015) documents that labor rigidity induces also a *term-structure effect*. Namely, the stationarity of the labor-share implies that the income insurance mechanism only concerns the transitory component of the firm's output.[2] Gamber (1988) and Menzio (2005) provide theoretical and empirical support considering respectively implicit contracts and labor market search frictions. Guiso, Pistaferri, and Schivardi (2005),

[1]The idea that distributional risk is at the heart of labor relations and, also, that the very role of the firm is that of insurance provider have a long tradition since Knight (1921) as well as Baily (1974), Azariadis (1978), Boldrin and Horvath (1995), Gomme and Greenwood (1995) and Danthine and Donaldson (2002). They suggest that workers' remuneration is partially fixed in advance and, hence, shareholders bear most of aggregate risk but, in exchange of income insurance, gain flexibility in labor supply. More recently, Guiso, Pistaferri, and Schivardi (2005), Shimer (2005) and Ríos-Rull and Santaeulàlia-Llopis (2010) provide empirical support.

[2]Lettau and Ludvigson (2005) and Lettau and Ludvigson (2014) document that macroeconomic variables are co-integrated and subject to both transitory and permanent shocks.

Cardoso and Portela (2009), and Ellul, Pagano, and Schivardi (2014) offer international empirical evidence of such an asymmetry in the response of labor compensations to transitory and permanent shocks. Consequently, workers' and shareholders' remunerations load respectively less and more than output on transitory risk. This has implications for the *timing* of wage and dividend risk. The former is upward-sloping and the latter is downward-sloping. In equilibrium, firms, whose cash-flows weigh more on the short-run, are riskier than firms, whose cash-flows weigh more on the long-run. Consequently, the model generates an equilibrium duration premium with dynamics driven by the aggregate labor-share. Since shorter (longer) cash-flow duration firms feature lower (higher) equilibrium prices relative to fundamentals, the duration premium is also interpreted as a value premium. The idea that markets compensate short-run (i.e. business cycle) uncertainty is consistent with the empirical findings of Koijen, Lusting, and van Nieuwerburgh (2014), Marfè (2015), Martin (2016), and Weber (2016).

An empirical investigation supports the main model mechanism. I measure labor rigidity with labor-share variation in the post-war US non-financial corporate sector. First, the labor-share is mean-reverting, counter-cyclical and features business-cycle fluctuations (half-life is about 3.5 years). Second, I document that variation in the labor-share is a main driver of the value premium dynamics. Consistently with the model predictions, i) labor-share changes are negatively related with the contemporaneous excess return of value firms over growth firms (Fama and French (1992)'s HML return hereafter); and ii) the labor-share level largely positively forecasts cumulative HML returns over horizons of three to five years. Recently and consistently, Lettau, Ludvigson, and Ma (2016) provide evidence that value strategies are exposed to a distributive factor proxied by capital share variation. Third, I show that a very similar pattern of predictability also concerns the duration premium. Namely, the labor-share level largely positively forecasts cumulative excess returns of short cash-flow duration portfolios over long cash-flow duration portfolios (DP return hereafter). Duration sorted portfolio returns are from Weber (2016) on the sample 1963:2013. Fourth, I verify that HML and DP returns are highly correlated across business cycle horizons. This is consistent with former evidence about cross-sectional cash-flows duration and book-to-market ratios (Dechow, Sloan, and Soliman, 2004; Weber, 2016). Fifth, I build a measure of value premium that is orthogonal to the duration premium and I verify that the predictability by labor-share variation completely disappears. The economic relevance of such a *duration channel* of labor rigidity is supported by the fact that a spanning test with the duration premium as explanatory variable nullifies the alpha of the HML return. The whole analysis is robust to alternative measures of value, such as the return spread of portfolios sorted by either the earnings-to-price or the cash-flows-to-price ratios. Overall, the empirical analysis supports the idea that labor-share variation shapes the value premium dynamics at business cycle frequency and that this can be understood as a result of the *term-structure effect* of labor rigidity.

The model consists of three simple ingredients. First, wages and dividends are modelled as potentially concave and convex functions of the transitory component of total resources (Marfè, 2015; Greenwald, Lettau, and Ludvigson, 2014). This allows to qualitatively and quantitatively model the leverage and term-structure effects of labor rigidity. Second, workers do not access financial markets (Berk and Walden, 2013; Ai and Bhandari, 2016) and shareholders feature recursive preferences (Epstein and Zin, 1989). For labor rigidity strong enough, the equilibrium term-structure of equity premia is downward-sloping under preference for the early resolution of uncertainty. Third, a cross-section of firms is introduced by means of heterogeneity in the duration of cash-flows (Lettau and Wachter, 2007). In equilibrium, shorter (longer) cash-flows duration firms feature lower (higher) price to fundamentals and, hence, can be interpreted as value (grwoth) firms. Finally, labor rigidity enhances the pricing of short-term risk and generates an equilibrium duration/value premium, which is intertemporally related to the labor-share, in line with the actual data.

The model calibration exploits the information from the term-structures of macroeconomic risk to infer about the effect of aggregate labor rigidity on the timing of dividend risk. The term-structure effect of labor rigidity is included in the model calibration by setting the leverage effect on dividends in order to match the increasing, flat and decreasing term-structures of respectively wage, consumption and dividend risk (Marfè, 2015). Under standard preferences, the model reconciles a number of standard asset pricing facts (i.e. low and smooth risk-free rate, high equity premium and excess return volatility over fundamentals, price-dividend ratio level and volatility) with the term-structures of equity as well as the value premium. Namely, the model generates, as an equilibrium outcome, the dynamic relation between the labor-share and the value premium documented from the data. After a negative transitory shock, labor rigidity leads to an increase in the labor-share and a decrease in the dividend-share In turn, dividend risk shifts toward the short-horizon and, hence, the value premium increases. The persistent labor-share dynamics forecasts business cycles fluctuations of the value premium.

Since the model is kept simple for the sake of exposition, it cannot *quantitatively* match the magnitude and the variation of the value premium. However, I show that the quantitative results substantially improve by including in the model an additional source of cross-sectional heterogeneity. Namely, I assume that firms have a different exposition to transitory risk, which can be interpreted as a result of firm-specific labor rigidity. Then, the differential in equity compensations and its time-variation increase. Moreover, if such a transitory risk has both a priced and an unpriced component, the model can recover the empirical findings that equity compensation and volatility are respectively a decreasing and U-shaped functions of cash-flow duration.

The paper is related to the large literature which aims to link the value premium to the firms fundamentals. Among others, Berk, Green, and Naik (1999), Gomes, Yaron, and Zhang (2003) and Zhang (2005) focus on the investment decision. In particular, Zhang (2005) examines in partial equilibrium the interaction of time-varying price of risk and asymmetric adjustment costs, concluding that value firms deserve high compensations in bad times. Similarly to these works, I also build on the operating leverage hypothesis of Carlson, Fisher, and Giammarino (2004), which has found empirical support in Novy-Marx (2011). However, the present paper is complementary to and differs from these works because it focuses on the role of *aggregate* labor rigidity in general equilibrium and finds strong support concerning the time-series dynamics of the value premium.

Similarly to Santos and Veronesi (2004) and Lettau and Wachter (2007), the concept of cash-flow duration is used to build a cross-section of firms. Among others, Dechow, Sloan, and Soliman (2004) find empirical support to the idea that growth stocks have larger duration than value stocks (see also Campbell and Mei (1993), Leibowitz and Kogelman (1993), Cornell (1999) and Berk, Green, and Naik (2004)).[3] Differently from these works, the present paper exploits the link between labor rigidity and the timing of dividend risk to explain the dynamics of the value premium in general equilibrium. Instead, Lettau and Wachter (2007, 2011) generate a value premium through exogenously specified correlations between the price of risk and expected dividend growth in partial equilibrium.

A number of works investigates the role of labor relations on asset prices. Labor rigidity leads to risky equity returns and can obtain as a result of distributional risk, as in Danthine and Donaldson (1992, 2002) and Marfè (2015), infrequent wage resettling, as in Favilukis and Lin (2015), search frictions, as in Kuehn, Petrosky-Nadeau, and Zhang (2012), or labor mobility, as in Donangelo (2014). The present paper builds on Marfè (2015)'s *term-structure effect* of aggregate labor rigidity and recognizes the labor-share as a main driver of both the value premium and duration premium dynamics. Therefore, the model mechanism is different from and complementary to the works that focus on idiosyncratic productivity to build cross-sectional heterogeneity in labor rigidity (Gourio (2008), Favilukis and Lin (2015), Donangelo, Gourio, and Palacios (2015)).[4]

Finally, the present paper is related to the recent works which aim to find a macroeconomic explanation of the term-structure of equity. Ai, Croce, Diercks, and Li (2015), Kogan and Papanikolaou (2015), Belo, Collin-Dufresne, and Goldstein (2015) and Hasler and Marfè (2015) focus on investment and financing decisions and rare disasters and provide potential explanations for the findings of van Binsbergen, Brandt, and Koijen (2012) and van Bins-

[3]Notice that the concept of cash-flows duration should not necessarily be interpreted as the expected life of the firm. Short duration allows to model the cash-flows of the fraction of firms whose core business is well represented by current cash-flows risk. Whereas long duration allows to model the cash-flows of firms, whose core business is better represented by future cash-flows risk.

[4]A model extension with cross-sectional heterogeneity in transitory risk highlights how the term-structure effect of aggregate labor rigidity and cross-sectional heterogeneity in labor rigidity interact and affect the value premium dynamics.

bergen, Hueskes, Koijen, and Vrugt (2013). I focus on the role of labor rigidity similarly to Marfè (2015), who documents that, at the aggregate level, the timing of dividend risk should be largely imputed to a mechanism of income insurance from shareholders to workers. The present paper provides a potential explanation for the empirical findings by Weber (2016) on the duration premium and its relation with the value premium.

The paper is organized as follows. Section 2 provides empirical support to the main model assumptions and mechanism. Section 3 describes the model and the main theoretical predictions. Section 4 proposes a calibration and discusses the predictions of both a simple and a generalized version of the model. Section 5 concludes.

2 Empirical Support

2.1 Non-Financial Corporate Sector Data

The key variables are from the current account of the non-financial US corporate sector. Data are yearly on the sample 1946:2013 and are collected from the Flow of Funds, Integrated macroeconomic accounts, table S.5.a. I consider the net value added (V), the compensations to employees (W), the net interests paid (B), the net dividends paid (D), the net operating surplus (S), the gross fixed capital formation (I), and total assets (A). I define W/V, B/V and D/V respectively as the shares of workers', bondholders' and shareholders' remuneration. I/A is a measure of investment. Data of real GDP are from NIPA table 1.1.6. Data of the value premium, i.e. HML returns, the size premium, i.e. SMB returns, and equity market are from Kenneth French's webpage. Data of price-earnings and price-dividends ratios on the S&P500 are from Robert Shiller's webpage.

Table 1: Non-financial corpotate sector: current account 1946-2013

			% share
(a)		Gross value added	100
	(a.1)	- Capital depreciation	(11.6)
(b)		= Net value added	88.4
	(b.1)	- Compensations to employees	(62.9)
	(b.2)	- Taxes on production and imports less subsidies	(8.7)
(c)		= Net operating surplus	16.8
	(c.1)	- net interest paid	(2.5)
	(c.2)	- net dividends paid	(4.0)
	(c.3)	- net reinvestment of earnings	(-0.8)
(d)		= Net national income	11.1
	(d.1)	- Current taxes on income, wealth, and other transfers	(5.8)
(e)		= Net disposable income	5.3
	(e.1)	- Capital transfers	(0.0)
(f)		= Net saving	5.3

Summary of Integrated macroeconomic accounts, table S.5.a

Table 1 reports the sample average shares from the current account of the non-financial US corporate sector.

The next sections investigate the relation between aggregate labor rigidity and the value premium. I interpret variation in labor-share (W/V) as a measure of labor rigidity: as long as workers' remuneration is partially insured from productivity shocks, we expect to observe counter-cyclical changes in the labor-share. In US postwar data of the non financial corporate sector, the correlation between changes in the labor-share and changes in log value added is about -43%. To interpret this negative correlation as a form of insurance within the firm, we have to verify that the covariance between labor-share and value added offset the variation of the labor-share and, in turn, induces a smoothing effect on wages. This is the case:

$$\begin{aligned} 1 &= \frac{\text{var}(\Delta \log V)}{\text{var}(\Delta \log W)} + \frac{\text{var}(\Delta \log W/V)}{\text{var}(\Delta \log W)} + 2\,\frac{\text{cov}(\Delta \log V, \Delta \log W/V)}{\text{var}(\Delta \log W)} \\ &= 124\% + 25\% - 49\%. \end{aligned}$$

These results resemble the empirical findings of Boldrin and Horvath (1995), Shimer (2005) and Ríos-Rull and Santaeulàlia-Llopis (2010).[5]

I also verify that the labor-share has mean-reverting dynamics by regressing the changes on the lagged levels:

$$\Delta W/V_t = \underset{\text{NW-}t:\,2.35}{0.0947} - \underset{\text{NW-}t:\,-2.37}{0.1340} W/V_{t-1} + \epsilon_t, \qquad R^2 = 5.64\%.$$

The negative and highly significant coefficient suggests that the labor-share follows a mean-reverting law of motion. The first lag autocorrelation of the labor-share at yearly frequency is about 82.35%. The autocorrelation function decreases rapidly and it is not significantly different from zero beyond the fifth lag. The implied half-life of the labor-share is about 3.57 years which denotes fluctuations at business cycle frequency.[6] To avoid any bias due to time-trends, in each of the following regressions I use a de-trended version of the labor-share. In the Online Appendix (Table A), I report the regression estimates from de-trending and I document that, on each relevant sample, the de-trended labor-share has stationary dynamics (that is we reject the null of an augmented Dickey Fuller unit-root test).

2.2 Labor Rigidity and the Value Premium

This section investigates both the contemporaneous and the intertemporal relation between the labor-share and the value premium.

I start with the regression of HML returns on the change in labor-share (ΔW/V). Table 2

[5] The variance decomposition is computed from yearly data: using quarterly data, the relative size of the negative covariance term is about twice as large.

[6] The first lag autocorrelation from quarterly data is about 95.14%, which implies a similar half-life of about 3.48 years.

reports the estimation results. In regression (1), ΔW/V is the only independent variable. The

Table 2: Labor Rigidity and Value Premium

The table reports the estimates of the regression

$$\text{HML}_t = b_0 + b_1 \Delta W/V_t^{\star} + b_2' \text{ macro controls} + b_3' \text{ financial controls} + \epsilon_t$$

where the dependent variable is the high minus low return (Fama and French (1992)) at time t; the independent variables are the change and the lagged value of the de-trended labor-share ($\Delta W/V_t^{\star}$ and $W/V_{t-1}^{\star}$), the change and the lagged value of the bondholders' remuneration ($\Delta B/V_t$ and B/V_{t-1}), the change and the lagged value of the shareholders' remuneration ($\Delta D/V_t$ and D/V_{t-1}), the change and the lagged value of investments to assets ($\Delta I/A_t$ and I/A_{t-1}), the log changes in value added ($\Delta \log V$) and GDP ($\Delta \log Y$), the lag and its square of the three Fama and French (1992) return factors (HML, SMB, MKT), and the lag of the price-earnings and price-dividends ratios (P/E and P/D). Data are yearly on the sample 1946-2013. The Newey-West corrected t-statistics are reported in parenthesis. Economic significance denotes standardized coefficients. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
Δ W/V workers' remuneration	-2.95***	-2.54**	-2.60*	-2.80	-2.89**	-2.88*
t-stat	(-2.68)	(-2.14)	(-1.79)	(-1.58)	(-2.33)	(-1.71)
Macroeconomic controls						
lag W/V		1.03**		0.73		-0.05
t-stat		(1.99)		(0.83)		(-0.06)
Δ B/V bondholders' remuneration			-3.44	-2.48		-2.94
t-stat			(-0.66)	(-0.53)		(-0.53)
lag B/V				-0.26		-0.22
t-stat				(-0.25)		(-0.14)
Δ D/V shareholders' remuneration			0.82	-0.17		0.08
t-stat			(0.74)	(-0.12)		(0.08)
lag D/V				-2.52		-3.01*
t-stat				(-1.41)		(-1.90)
Δ I/A investment to assets			-5.14	-2.02		1.27
t-stat			(-1.07)	(-0.37)		(0.22)
lag I/A				-2.57		-3.58
t-stat				(-1.11)		(-1.30)
Δ log V value added			-0.28	-0.73		-0.74
t-stat			(-0.61)	(-1.35)		(-1.22)
Δ log Y real GDP			0.87	1.05		1.72***
t-stat			(1.19)	(1.50)		(3.15)
Financial controls						
lag HML value minus growth excess return					-0.23**	-0.26***
t-stat					(-2.34)	(-2.71)
lag HML^2					0.81**	0.99*
t-stat					(2.18)	(1.88)
lag SMB small minus big excess return					0.27	0.28
t-stat					(1.13)	(1.09)
lag SMB^2					-0.47	-0.35
t-stat					(-0.58)	(-0.39)
lag MKT market excess return					-0.23**	-0.31***
t-stat					(-2.24)	(-3.38)
lag MKT^2					0.53**	0.54*
t-stat					(2.06)	(1.83)
lag log P/E price to earnings					0.06	0.01
t-stat					(0.49)	(0.04)
lag log P/D price to dividends					-0.10	-0.03
t-stat					(-1.05)	(-0.16)
adj-R^2	0.06	0.08	0.03	0.03	0.12	0.10

estimate coefficient is negative and significant, and the adjusted R^2 is about 6%. In regression (2), I add the lagged level of the labor-share as a regressor: as expected, ΔW/V and W/V are respectively negatively and positively related to the HML return. In regressions (3) and (4), I add the changes and the lagged levels of bondholders' remuneration (B/V), shareholders' remuneration (D/V), investment (I/A) as well as the changes in net value added (Δ log V) and GDP (Δ log Y). These macroeconomic controls account for investment and financing decisions, and for business cycle. The coefficient on the change of the labor-share is still negative but barely significant. In regression (5), I consider a battery of financial controls, such as the lag of the three Fama and French (1992) factors, their squares as well as the valuation ratios based on earnings and dividends. ΔW/V is significantly and negatively related to the HML return. Finally in regression (6), I include both macroeconomic and financial controls: the negative relation between the value premium and the expected change in the labor-share is only barely significant. Overall, both macroeconomic and financial controls do not help to increase substantially the explanatory power of regression (1).

The Online Appendix (Table B) provides further robustness. To avoid multicollinearity and gain precision, I run bivariate regressions with the change of the labor-share and one control at a time as independent variables. The labor-share coefficient remains is negative and highly statistically significant in 17 out of 17 regressions. Controls do not provide additional explanatory power.

As a second step, I consider the intertemporal relation between labor rigidity and value premium. Since the labor-share is stationary and persistent, the negative contemporaneous relation in Table 2 suggests that the labor-share could have a substantial predictive power: the current level of the labor-share is expected to be positively correlated with future realizations of the value premium at several horizons. Therefore, I verify whether the level of the labor-share (W/V) forecasts future HML returns. Table 3 reports the estimation results.

In a univariate regression (panel A), W/V predicts future cumulative HML returns up to a 7 years horizon with a positive and significant coefficient –consistently with the negative contemporaneous relation in Table 2. The adjusted R^2 ranges from 2% at one year horizon up to 18% at 5 years horizon.

In panel B, I include in the regression the levels of D/V, B/V, and I/A to account for shareholders' remuneration and financing and investment decisions. I also include valuation ratios based on earnings and dividends, the credit spread (CS), the term spread (TS), the short rate (Rf) and the aggregate financial leverage (FL), since they are among the most used and powerful predictors of financial returns.[7] The results show that the relation between the

[7] The financial leverage is corporate bonds relative to equity from the Flows of Funds; the Moody's Baa-Aaa credit spread is from the Federal Reserve; and the 10 years term spread and the short interest rate are from Robert Shiller's webpage.

Table 3: Value Premium Predictability and Labor-Share

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\text{HML}_{t+i}) = b_0 + b_1\text{W/V}_t^\star + b_2'\,\text{controls} + \epsilon_t$$

where the dependent variable is the cumulative high minus low return (Fama and French (1992)) from time t over the horizon of 1, 2, 3, 5, 7 years; the independent variables are the de-trended time t labor-share ($W/V_t^\star$) in Panel A, and the de-trended time t labor-share ($W/V_t^\star$), bondholders' remuneration (B/V_t), shareholders' remuneration (D/V_t), investments to assets (I/A_t), price-earnings and price-dividends ratios (P/E_t and P/D_t), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1946-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Panel A	Horizon				
	1	2	3	5	7
W/V* workers' remuneration	1.260**	1.471***	1.552***	1.212***	0.751***
t-stat	(2.51)	(3.09)	(3.71)	(3.67)	(2.89)
adj-R^2	0.02	0.09	0.16	0.18	0.11

Panel B	Horizon				
	1	2	3	5	7
W/V* workers' remuneration	0.594	1.352**	1.810***	1.455***	0.587***
t-stat	(0.96)	(2.35)	(3.46)	(3.97)	(2.71)
B/V bondholders' remuneration	-3.356**	-1.541	-0.285	-0.172	-1.426***
t-stat	(-2.40)	(-1.04)	(-0.27)	(-0.34)	(-3.49)
D/V shareholders' remuneration	-2.842*	-0.079	0.439	-0.356	-0.842**
t-stat	(-1.82)	(-0.06)	(0.39)	(-0.61)	(-2.24)
I/A investment to assets	-2.860	-3.358	-3.865	-2.301*	0.144
t-stat	(-0.89)	(-0.93)	(-1.39)	(-1.72)	(0.13)
log P/E price to earnings	0.425***	0.317***	0.150*	-0.026	0.069
t-stat	(2.70)	(2.69)	(1.70)	(-0.27)	(0.86)
log P/D price to dividends	-0.260*	-0.255**	-0.164**	0.003	-0.029
t-stat	(-1.84)	(-2.62)	(-2.51)	(0.03)	(-0.44)
FL financial leverage	0.341	0.007	-0.386	-0.444**	-0.025
t-stat	(0.91)	(0.03)	(-1.64)	(-2.59)	(-0.23)
CS credit spread	24.712***	15.352***	7.440***	2.815	7.189***
t-stat	(5.55)	(3.19)	(2.77)	(0.91)	(3.34)
TS term spread	0.973	-0.404	-1.168**	-1.331***	-0.954**
t-stat	(1.31)	(-0.53)	(-2.08)	(-5.12)	(-2.17)
Rf short rate	6.236	22.459	19.261	-12.907	-13.055
t-stat	(0.14)	(0.74)	(0.81)	(-0.69)	(-0.92)
adj-R^2	0.09	0.15	0.28	0.43	0.49

future value premium and the current labor-share level remains positive and significant at any horizon. CS and TS provide additional explanatory power at some horizons.

The Online Appendix (Tables C-D-E-F-G-H) provides further robustness. First, to avoid multicollinearity and gain precision, I run bivariate regressions for each horizon with the labor-share and one control at a time as independent variables. The labor-share coefficient remains positive and is statistically significant in 44 out of 45 regressions. Second, I verify that the positive relation between the future value premium and the current labor-share is significant in sub-samples. This is the case for horizons larger than 2 years on the sub-sample 1946-1979, whereas it is the case at any horizon on the sub-sample 1979-2013.

The results of Table 2 and 3 document a strong relation between labor-share variation and the value premium dynamics. Figure 1 summarizes the empirical findings. The upper panels report the standardized time-series and the scatter plot of the labor-share change and the contemporaneous HML return, whereas the lower panels report the standardized time-series and the scatter plot of the labor-share level and the cumulative HML return over the subsequent 5 years.

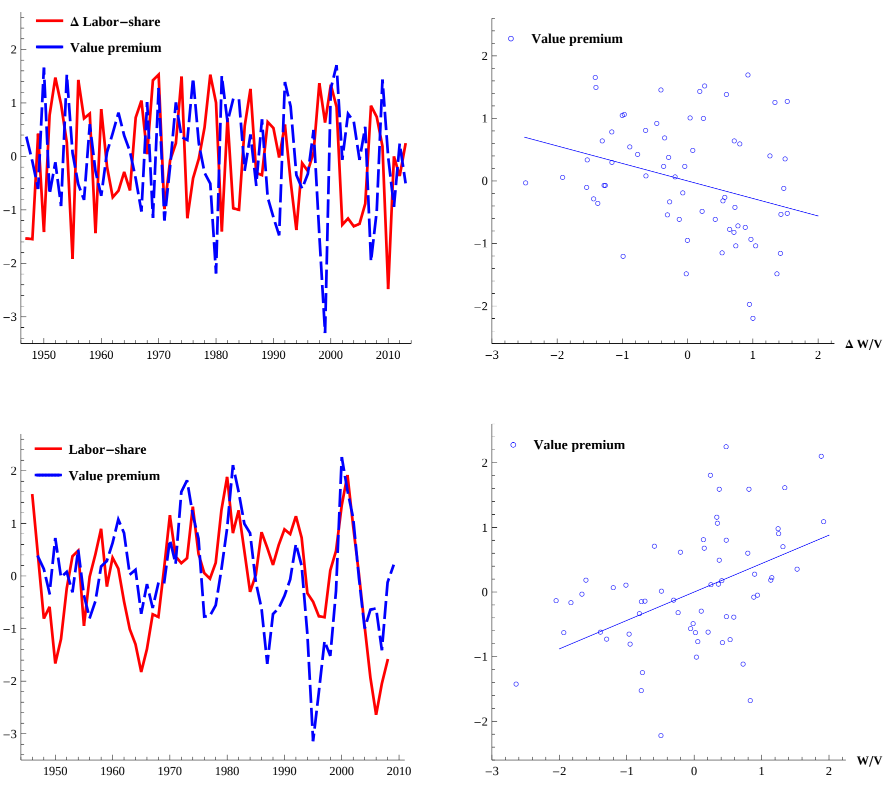

Figure 1: Labor rigidity and the value premium

Upper panels: time-series (left) and scatter plot (right) of contemporaneous standardized labor-share changes and HML returns. Lower panels: time-series (left) and scatter plot (right) of standardized labor-share levels and future cumulative HML returns over 5 years horizon. Data are yearly on the sample 1946:2013.

2.3 Why does Labor Rigidity Drive the Value Premium?

2.3.1 The term-structure effect of labor rigidity

A large body of literature highlights the role of labor market dynamics for asset prices. In presence of labor rigidity, the total cost of labor does not equal labor productivity but incorporates an insurance component. Such an insurance mechanism from shareholders to workers makes wages smoother than output and produces volatile and pro-cyclical payouts to shareholders (Danthine and Donaldson, 1992, 2002; Shimer, 2005; Santos and Veronesi, 2006; Favilukis and Lin, 2015).

Marfè (2015) shows both theoretically and empirically that labor rigidity is a main driver of the timing of risk of dividends and equity. Namely, he verifies that risk-sharing between workers and shareholders mostly concerns transitory risk, whereas it does not affect permanent risk. This is consistent with the theoretical and empirical works by Gamber (1988), Menzio (2005), Guiso, Pistaferri, and Schivardi (2005), Cardoso and Portela (2009), and Ellul, Pagano, and Schivardi (2014). A consequence of this asymmetry in the response of labor compensations to transitory and permanent shocks is that (i) the labor-share is a decreasing function of short-run (e.g. business cycle) uncertainty in the economy; (ii) risk-sharing smooths short-run risk of wages, leading to an upward-sloping term-structure of wage risk; (iii) risk-sharing also boosts short-run risk of dividends, leading to downward-sloping dividend risk. In turn, equity inherits the negative slope of dividend risk and labor-share variation largely forecasts dividend strip (i.e. short-horizon equity claims) return volatility and premium.

An implication of the above economic mechanism is that the labor-share should be a predictor of portfolio strategies driven by short-run (e.g. business cycle) uncertainty. Interestingly, Dechow, Sloan, and Soliman (2004) show that value firms feature shorter cash-flows duration than growth firms. Thus, the returns of firms with low price relative to fundamentals (value) weigh more on short-run uncertainty than returns of firms with high price relative to fundamentals (growth). In turn, the value premium captures a net positive exposition to short-run uncertainty.

Therefore, downward-sloping equity risk (van Binsbergen, Brandt, and Koijen, 2012; van Binsbergen, Hueskes, Koijen, and Vrugt, 2013; van Binsbergen and Koijen, 2016) represents a rationale for a positive value premium as pointed out by Lettau and Wachter (2007, 2011). This paper intends to verify whether the term-structure effect of labor rigidity (Marfè, 2015) provides a macroeconomic explanation for the partial equilibrium framework by Lettau and Wachter (2007) and the value premium dynamics.

2.3.2 Inspecting the mechanism

In order to understand whether the above mechanism can explain the empirical evidence, I adopt the following strategy. First, I complement the existing evidence that labor-share variation induces short-run risk in several measures of firm's income and shareholders' remuneration. Second, I look at the relation between labor-share variation and the duration premium (i.e. the excess return of a portfolio of short cash-flow duration firms relative to a portfolio of long cash-flow duration firms). Here, I expect a positive intertemporal correlation. Third, I look at the relation between the value premium and the duration premium. Here, I expect a positive contemporaneous correlation. Fourth, I verify whether the predictability of the value premium by the labor-share disappears when the value premium is orthogonalized with respect to the duration premium.

The first step of the analysis verifies that growth rates of several measures of firm's income and shareholders' remuneration are negatively correlated with changes in labor-share. Heteroscedasticity robust regression estimates are reported in the left part of Table 4. The negative relation between net value added and labor-share is consistent with the counter-cyclical dynamics of the latter. The negative relation between several measures of shareholders' remuneration and labor-share is consistent with income insurance from shareholders to workers.

Table 4: Short-Run Risk and Labor-Share

The left panel of the table reports the coefficient estimates, the heteroscedasticity robust t-statistics, and the R^2 of the regression

$$\Delta \log X_t = b_0 + b_1 \Delta W/V_t + \epsilon_t,$$

where the dependent variable is the time t log change of several measures of firm's income and shareholders' remuneration ($\Delta \log X_t$) and the independent variable is the time t change of the labor-share (W/V_t). Data are yearly on the sample 1946-2012. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels. The middle and right panels of the table report respectively the 5-years and 10-years variance ratios of $\Delta \log X_t$ as well as of the fitted values and the residuals from the above regression.

				5 years Variance Ratios			10 years Variance Ratios		
X_t	b_1	t-stat	R^2	$\Delta \log X_t$	fitted val.	residuals	$\Delta \log X_t$	fitted val.	residuals
Non-Financial Corporate Sector									
Net value added	-1.35***	-4.06	0.19	0.868	0.838	1.299	0.763	0.421	1.277
Operating surplus	-6.87***	-17.46	0.78	0.628	0.838	1.274	0.206	0.421	1.038
Before tax profits	-8.96***	-7.98	0.49	0.825	0.838	0.900	0.350	0.421	0.655
After tax profits	-9.51***	-8.20	0.50	0.978	0.838	1.161	0.502	0.421	0.907
Dividends plus net repurchases	-7.02***	-2.67	0.09	0.702	0.838	0.514	0.393	0.421	0.308
Dividends plus net repurchases ex 2005-06[a]	-6.64**	-2.48	0.08	0.705	0.645	0.542	0.690	0.247	0.362
Dividends	-1.83	-1.06	0.02	0.237	0.838	0.222	0.146	0.421	0.133
Dividends ex 2005-06[a]	-2.16***	-3.73	0.12	0.705	0.645	0.724	0.690	0.247	0.646
S&P 500 Index									
Earnings	-9.68***	-5.04	0.17	0.262	0.836	0.274	0.105	0.421	0.162
Earnings ex 2008-09[b]	-8.13***	-5.66	0.20	0.775	0.975	0.537	0.315	0.313	0.250
Dividends	-1.56***	-3.18	0.09	1.061	0.838	0.961	0.818	0.421	0.758

[a] Excluded observations 2005 and 2006 are respectively beyond -10 and 11 standard deviations around the average.

[b] Excluded observations 2008 and 2009 are respectively beyond -6 and 4 standard deviations around the average.

The much larger magnitude of the coefficients –relative to the net value added case– is consistent with a sizeable labor leverage effect. The middle and right parts of Table 4 show the 5 years and 10 years variance ratios for each measure of firm's income and shareholders' remuneration as well as for the corresponding fitted values and residuals from the regressions on the labor-share changes. We observe that (i) long-run variance ratios are most of the times lower than one, and (ii) variance ratios of residuals lie substantially above those of the fitted values. This implies that labor-share variation is a sizeable source of transitory risk of shareholders' remuneration.[8]

The second step of the analysis intends to verify whether the labor-share forecasts the duration premium and whether the explanatory power is comparable to that for the value premium.

To construct an empirical proxy for the duration premium, I use data from Weber (2016), available on Michael Weber website. At the end of June each year t from 1963 to 2013, Weber sorts stocks in 10 equally weighted duration portfolios (D1,. . . , D10) based on the cash-flow duration measure of Dechow, Sloan, and Soliman (2004). These portfolios are rebalanced annually. I annualize portfolio returns by taking the sum of log monthly returns over each year t. I interpret as a measure of duration premium, DP hereafter, the average excess return from a portfolio that goes long in the short-duration decile (D1) and short in the long-duration decile (D10).

Table 5 reports the estimates of the regressions of the future cumulative return from the strategy D1–D10 on the current level of the labor-share. In panel A, I report the predictive regressions of the value premium on the labor-share in the sub-sample 1963-2013. Similarly to the full sample regressions in Table 3, coefficients are positive and statistically significant and the largest adjusted-R^2 obtains at 3 and 5 years horizons.

In panel B1, I report the predictive regressions of the duration premium on the labor-share for the sample 1963-2013. The labor-share positively and significantly forecasts the duration premium at each horizon. The adjusted-R^2 are larger than in Panel A, but they show a similar pattern across the horizons. In panel B2, I report the same predictive regressions but I add a battery of controls as in panel B of Table 3. The coefficients for the labor-share are still positive and highly significant. Financial leverage is the only other variable with statistically

[8]This fact is robust to abnormal changes in the payout policy. The Homeland Investment Act (2004) has determined abnormal dividend growth rates in 2005 and 2006 (Dharmapala, Foley, and Forbes, 2011) –namely a drop and recovery beyond 10 standard deviation around the mean computed from the remainder of the sample. These outliers induce much of dividends negative autocorrelation and transitory risk. As shown in Table 4, excluding these abnormal growth rates, dividend variance ratios are higher in accord with the usual smoothing policy, but growth rates are highly negative correlated with labor-share changes. The growth rates' component explained by labor-share variation features variance ratios much lower than the unexplained component. Thus, labor rigidity leads to transitory dividend risk. A similar reasoning applies to the abnormal drop and recovery in S&P 500 earnings in 2008-2009.

Table 5: Duration Premium Predictability and Labor-Share

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+X_{t+i}) = b_0 + b_1 \mathrm{W/V}_t^\star + b_2' \,\mathrm{controls} + \epsilon_t, \qquad X = \{\mathrm{HML}, \mathrm{DP}\}$$

where the dependent variable is either the cumulative high minus low return (HML, Fama and French (1992)) or the cumulative low duration minus high duration return (DP, Weber (2016)) from time t over the horizon of 1, 2, 3, 5, 7 years; the independent variables are the de-trended time t labor-share ($W/V_t^\star$) in Panel A, and the de-trended time t labor-share ($W/V_t^\star$), bondholders' remuneration (B/V_t), shareholders' remuneration ($\mathrm{D/V}_t$), investments to assets ($\mathrm{I/A}_t$), price-earnings and price-dividends ratios ($\mathrm{P/E}_t$ and $\mathrm{P/D}_t$), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1963-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Panel A: Value Premium	Horizon				
	1	2	3	5	7
$\mathrm{W/V}^\star$ workers' remuneration	1.197**	1.584***	1.761***	1.313***	0.831***
t-stat	(2.08)	(2.99)	(3.64)	(3.42)	(2.71)
adj-R^2	0.01	0.09	0.19	0.18	0.11

Panel B1: Duration Premium	Horizon				
	1	2	3	5	7
$\mathrm{W/V}^\star$ workers' remuneration	2.420**	2.876***	2.968***	2.512***	1.797***
t-stat	(2.17)	(3.15)	(3.84)	(3.72)	(2.81)
adj-R^2	0.04	0.15	0.23	0.27	0.20

Panel B2: Duration Premium	Horizon				
	1	2	3	5	7
$\mathrm{W/V}^\star$ workers' remuneration	4.057***	4.215***	3.902***	3.821***	1.825***
t-stat	(2.71)	(4.67)	(5.29)	(7.71)	(3.24)
B/V bondholders' remuneration	-2.097	-2.957	-1.697	-1.056	-0.752
t-stat	(-0.43)	(-0.85)	(-0.70)	(-0.87)	(-0.53)
D/V shareholders' remuneration	-4.299	-1.583	-1.362	0.176	1.225
t-stat	(-1.49)	(-0.75)	(-0.76)	(0.18)	(1.13)
I/A investment to assets	-5.792	-0.842	3.891	9.799***	8.766***
t-stat	(-0.91)	(-0.16)	(1.18)	(4.18)	(3.13)
log P/E price to earnings	-0.368	-0.177	-0.347**	-0.620***	-0.255**
t-stat	(-0.85)	(-0.65)	(-2.09)	(-8.80)	(-2.25)
log P/D price to dividends	0.262	0.148	0.345*	0.575***	0.289***
t-stat	(0.68)	(0.53)	(1.99)	(6.79)	(2.82)
FL financial leverage	-2.111**	-1.424***	-1.086***	-0.858***	-0.147
t-stat	(-2.60)	(-2.77)	(-3.45)	(-4.39)	(-0.59)
CS credit spread	0.087	0.168**	0.122**	0.016	0.085**
t-stat	(0.75)	(2.12)	(2.47)	(0.62)	(2.37)
TS term spread	0.013	0.005	-0.003	0.000	-0.004
t-stat	(0.82)	(0.38)	(-0.30)	(0.02)	(-0.58)
Rf short rate	0.203	-0.323	-0.421	-0.656	-0.805**
t-stat	(0.18)	(-0.50)	(-0.88)	(-1.46)	(-2.52)
adj-R^2	0.08	0.33	0.44	0.68	0.40

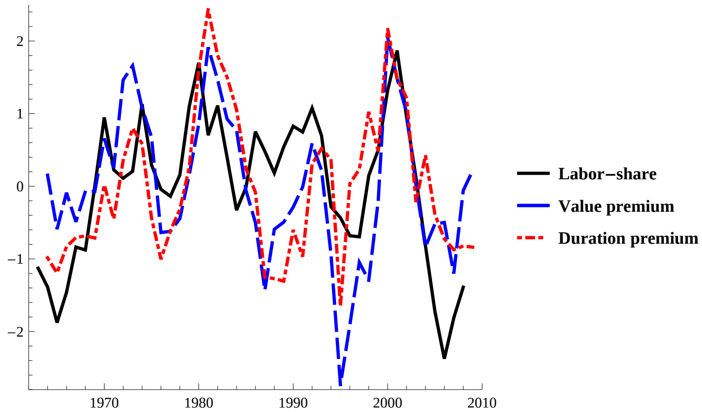

Figure 2: Labor-Share, Value Premium and Dutation Premium

Standardized time-series of the (de-trended) labor-share (solid line), 5-years average of HML return (dashed line) and 5-years average of the D1-D10 return (dotted line).

significant coefficients across different horizons.

The Online Appendix (Tables I-J-K-L-M) provides further robustness: to avoid multi-collinearity and gain precision, I run bivariate regressions for each horizon with the labor-share and one control at a time as independent variables. The labor-share coefficient remains positive and is statistically significant in 45 out of 45 regressions.

The results of Table 3 and 5 suggest that (i) the labor-share is a main driver of both the value premium and the duration premium; (ii) the explanatory power is similar in magnitude across horizons; (iii) the positive intertemporal relation is consistent with the idea that the labor-share is a decreasing function of short-run (e.g. business cycle) uncertainty; and (iv) both the value premium and the duration premium are a compensation for such a risk. Figure 2 reports the time-series of the labor-share and the 5-years ahead value premium and duration premium. The labor-share shapes business cycles fluctuations of both type of premia.

The third step of the analysis documents the strong connection between the value premium and the duration premium across the horizons. As suggested by Figure 2, the HML return and the return from the strategy D1–D10 are highly correlated. Panel A of Table 6 reports the regressions of cumulative HML return on the cumulative return from the strategy D1–D10 over the horizons from one to 7 years. For each horizon, the coefficient is positive and highly significant and the adjusted-R^2 are very large and range from about 35% to 55%.

The residuals associated with each horizon can be used to understand whether the explanatory power of the labor-share for both strategies represents the same economic mechanism. To do so I regress the future cumulative HML return orthogonalized with respect to the duration premium on the current level of the labor-share. Section 2.3.1 argues that the value premium predictability by the labor-share is due to a term-structure effect of labor rigidity. If this is

Table 6: Value Premium, Duration Premium, and Labor-Share

The table reports the estimates of the regressions

$$\text{Panel A:} \qquad \frac{1}{n}\sum\nolimits_{i=1}^{n} \log(1+\text{HML}_{t+i}) = b_0 + b_1 \frac{1}{n}\sum\nolimits_{i=1}^{n} \log(1+\text{DP}_{t+i}) + \text{HML}^{\perp}_{t,n},$$

where the dependent variable is the cumulative high minus low return (HML, Fama and French (1992)) and the independent variable is the cumulative low duration minus high duration return (DP, Weber (2016)) from time t over the horizon of 1, 2, 3, 5, 7 years;

$$\text{Panel B:} \qquad \text{HML}^{\perp}_{t,n} = b_0 + b_1 \text{W/V}^{\star}_t + \epsilon_t,$$

where the dependent variable is the residual from the above regression for each horizon of 1, 2, 3, 5, 7 years and the independent variable is the de-trended time t labor-share ($W/V^{\star}_t$). Data are yearly on the sample 1963-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Panel A: Value Premium			Horizon		
	1	2	3	5	7
DP duration premium	0.428***	0.509***	0.480***	0.421***	0.350***
t-stat	(4.06)	(7.24)	(9.68)	(8.12)	(5.62)
adj-R^2	0.39	0.54	0.54	0.44	0.34

Panel B: Orthogonalized Value Premium			Horizon		
	1	2	3	5	7
$W/V^{\star}$ workers' remuneration	0.160	0.121	0.335	0.256	0.202
t-stat	(0.32)	(0.29)	(0.92)	(0.85)	(0.76)
adj-R^2	-0.02	-0.02	-0.00	-0.01	-0.01

the case, then we expect that the explanatory power of the labor-share for the orthogonalized value premium should deteriorate or even disappear.

Panel B of Table 6 shows that the labor-share does not explain the orthogonalized value premium. Coefficients are not statistically significant at any horizon and adjusted-R^2 are zero or lower. The scatter plots of the value premium, duration premium and orthogonalized value premium as a function of the labor-share are reported in Figure 3

The analysis has documented that the strong relation between labor-share variation and value premium dynamics can be understood as a result of the term-structure effect of labor rigidity. Income insurance within the firm shifts dividend and equity risk toward the short horizon and leads to a cross-sectional duration premium. The component of the value premium dynamics driven by labor-share variation is indeed, to a very large extent, a duration premium.

To complete the analysis, I provide a quantitative assessment of the link between value and duration premia by investigating whether, and to what extent, a value strategy delivers abnormal returns relative to a strategy that goes long a short duration portfolio and short a

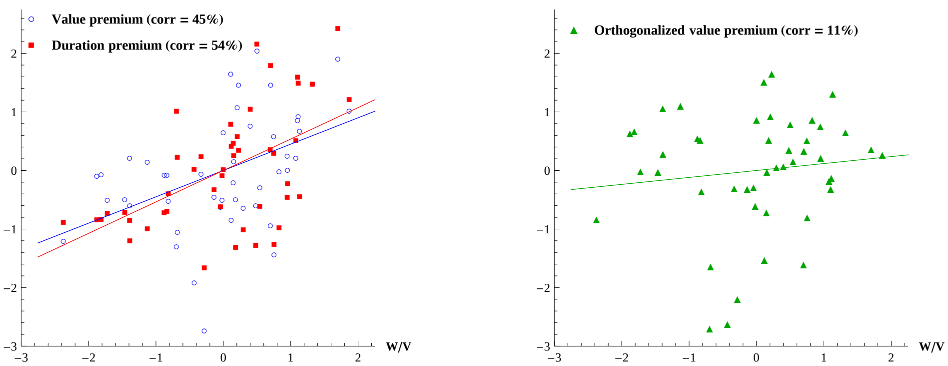

Figure 3: The Orthogonalized Value Premium

Left panel: scatter plot of the standardized (de-trended) labor-share (horizontal axis) and the 5-years average HML and D1–D10 returns (vertical axis). Right panel: scatter plot of the standardized (de-trended) labor-share (horizontal axis) and the 5-years average HML return orthogonalized with respect to the 5-years average D1–D10 return (vertical axis).

long duration portfolio.

To do so, I perform a spanning test: returns from the HML strategy are regressed onto returns from a number of potential explanatory factors. A positive and significant alpha implies that the value premium is not fully captured by the explanatory factors, so that an investor already trading in those factors would benefit from adding the HML strategy in his portfolio. In contrast, an insignificant alpha would suggest that the explanatory factors fully subsume the value premium.

Namely, I regress HML returns onto the returns from standard factors (the excess market return, the small minus big return, and the winners minus losers return) and a D1–D10 strategy, to understand what fraction of the value premium is captured by the duration premium. Table 7 shows the results. Controlling for the standard factors only delivers a positive and significant alpha. When the D1–D10 strategy is included in the regression, the alpha becomes negative and marginally significant. Not only a D1–D10 strategy subsumes the HML alpha, but also the HML component orthogonal to the duration strategy delivers negative excess returns.

Table 7 also shows the case in which the D1–D10 strategy is the dependent variable: both with and without the HML return on the right-hand-side, the alpha of the D1–D10 strategy is positive and highly significant.

These results do not establish a direct causal link between duration and value premia –a task beyond the scope of the paper. However, they do suggest that the mechanism linking value and duration premia, like the one proposed in this work, are potentially relevant to explain both the size and dynamics of the value premium.

Table 7: Spanning Value and Duration Premia

The table reports the estimates of the regressions

$$\begin{aligned}\text{HML}_t &= \alpha + b_1\text{MKT}_t + b_2\text{SMB}_t + b_3\text{WML}_t + b_4\text{DP}_t + \epsilon_t,\\ \text{DP}_t &= \alpha + b_1\text{MKT}_t + b_2\text{SMB}_t + b_3\text{WML}_t + b_4\text{HML}_t + \epsilon_t,\end{aligned}$$

where the independent variables are the excess market return (MKT), the small minus big return (SMB, Fama and French (1992)), the winners minus losers return (WML), and either the low duration minus high duration return (DP, Weber (2016)) or the high minus low return by Fama and French (1992) (HML) ; the dependent variable is either the HML or the DP return. Data are yearly on the sample 1963-2013. Reported t-statistics are heteroscedasticity robust. Symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	Without Duration Premium			**With Duration Premium**		
	α	t-stat	adj-R^2	α	t-stat	adj-R^2
HML	0.048**	2.50	0.13	-0.041*	-1.79	0.56
	Without Value Premium			**With Value Premium**		
	α	t-stat	adj-R^2	α	t-stat	adj-R^2
DP	0.185***	6.29	0.15	0.134***	6.04	0.57

2.4 Robustness: Alternative Valuation Ratios

The economic mechanism linking value premium dynamics to labor-share variation by means of a term-structure effect of labor rigidity has additional implications. Indeed, labor-share variation is expected to predict premia associated with claims that have exposition to the transitory risk in the economy. Assets more exposed to such transitory risk are expected to feature lower valuation ratios, other things equal.

Therefore, I generalize the former analysis and I verify whether (i) labor-share forecasts the return spread of portfolios sorted by several valuation ratios (similarly to the HML case in Table 3), and (ii) labor-share does not forecast the same return spread, once it is orthogonalized with respect to the duration premium (similarly to the HML case in Table 6).

I consider three alternative valuation ratios. First, I use the HML factor by Asness and Frazzini (2013) (HML_{af} hereafter): this factor is a timelier version of HML that accounts for more recent price movements and, conceptually, should be better suited at identifying value companies.[9] Second, I consider the portfolios sorted by earnings-to-price and cash-flows-to-prices ratios by Kenneth French and I build the return spread using the 1st and the 10th deciles.

Table 8 reports the estimates of the regressions of the future cumulative return from the

[9] Specifically, the standard method to form portfolios for the HML factor (Fama and French, 1992) updates B/M once a year on June 30th using both prices and book values from the previous December 31st. Therefore, B/M uses data that are, at least, six months old. Asness and Frazzini (2013) divide book by current prices updating the measure monthly.

Table 8: Valuation Ratios, Duration Premium, and Labor-Share

The table reports the estimates of the regressions

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\mathrm{X}_{t+i}) = b_0 + b_1\mathrm{W/V}_t^{\star} + \epsilon_t,$$

and

$$\mathrm{X}_{t,n}^{\perp} = b_0 + b_1\mathrm{W/V}_t^{\star} + \epsilon_t,$$

where the independent variable is the de-trended time t labor-share ($W/V_t^{\star}$) and the dependent variables X is either the high minus low return by Asness and Frazzini (2013) ($\mathrm{HML}_{\mathrm{af}}$), the earnings-to-prices spread ($\mathrm{EP}_{\mathrm{spread}}$), or the cash-flows-to-prices spread ($\mathrm{CFP}_{\mathrm{spread}}$) from time t over the horizon of 1, 2, 3, 5, 7 years, and their orthogonal components with respect to the low duration minus high duration return (DP, Weber (2016)):

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\mathrm{X}_{t+i}) = b_0 + b_1\frac{1}{n}\sum_{i=1}^{n}\log(1+\mathrm{DP}_{t+i}) + \mathrm{X}_{t,n}^{\perp}.$$

$\mathrm{EP}_{\mathrm{spread}}$ and $\mathrm{CFP}_{\mathrm{spread}}$ are the difference between the 10th and the 1st decile sorted-portfolio returns, available on Kenneth French's webpage. Data are yearly on the sample 1963-2013. Newey-West corrected t-statistics are reported in parenthesis. Symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Value premium (Asness Frazzini, 2013)	Horizon				
	1	2	3	5	7
$\mathrm{HML}_{\mathrm{af}}$ Asness Frazzini (2013)	1.664***	1.833***	1.800***	1.222***	0.760***
t-stat	(3.03)	(3.69)	(3.87)	(3.43)	(3.10)
adj-R^2	0.06	0.13	0.19	0.15	0.09
$\mathrm{HML}_{\mathrm{af}}^{\perp}$ Asness Frazzini (2013)	0.943**	0.606	0.506	0.259	0.255
t-stat	(2.03)	(1.53)	(1.37)	(0.85)	(1.14)
adj-R^2	0.01	0.01	0.01	-0.01	-0.01

Earnings to price spread	Horizon				
	1	2	3	5	7
$\mathrm{EP}_{\mathrm{spread}}$	1.613**	1.965***	2.023***	1.654***	1.206**
t-stat	(2.48)	(3.59)	(3.87)	(2.92)	(2.17)
adj-R^2	0.05	0.13	0.19	0.22	0.20
$\mathrm{EP}_{\mathrm{spread}}^{\perp}$	0.566	0.439	0.349	0.236	0.304
t-stat	(1.09)	(0.98)	(0.82)	(0.48)	(0.65)
adj-R^2	-0.01	-0.01	-0.01	-0.01	0.01

Cash-flows to price spread	Horizon				
	1	2	3	5	7
$\mathrm{CFP}_{\mathrm{spread}}$	1.257**	1.462***	1.387***	1.013**	0.877**
t-stat	(2.15)	(3.02)	(3.12)	(2.65)	(2.56)
adj-R^2	0.03	0.09	0.12	0.15	0.19
$\mathrm{CFP}_{\mathrm{spread}}^{\perp}$	0.192	0.040	-0.070	-0.115	0.107
t-stat	(0.45)	(0.10)	(-0.21)	(-0.48)	(0.47)
adj-R^2	-0.02	-0.02	-0.02	-0.01	-0.01

return spreads on the current level of the labor-share on the sample 1963-2013. Similarly to the HML case in Table 3 and in accord with the term-structure effect of labor rigidity, in all the three cases coefficients are positive and statistically significant and the largest adjusted-R^2 obtains at 5 years horizons.

Table 8 also reports the estimates of the regressions of the future cumulative return from the return spreads orthogonalized with respect to the duration premium on the current level of the labor-share. If predictability by the labor-share is due to a term-structure effect of labor rigidity, then we expect that the explanatory power of the labor-share for the orthogonalized return spreads should deteriorate or even disappear. This is the case: coefficients are not statistically different from zero and adjusted-R^2 fall to zero.

These results show that cash-flows duration is a pervasive characteristic of cross-sectional returns and that labor rigidity is an important source of time-variation of equity compensations. To provide further evidence of such a duration channel, I regress the return spreads on standard factors (the excess market return, the small minus big return, and the winners minus losers return) as well as the duration premium. Similarly to the HML case in Table 7, results in Table 9 show that the inclusion of the duration premium nullifies the alphas, which are not statistically different from zero.

Table 9: Valuation Ratios and Duration Premium

The table reports the estimates of the regressions

$$\mathrm{X}_t = \alpha + b_1\mathrm{MKT}_t + b_2\mathrm{SMB}_t + b_3\mathrm{WML}_t + b_4\mathrm{DP}_t + \epsilon_t,$$

where the independent variables are the excess market return (MKT), the small minus big return (SMB, Fama and French (1992)), the winners minus losers return (WML), the low duration minus high duration return (DP, Weber (2016)); the dependent variable X is either the high minus low return by Asness and Frazzini (2013) ($\mathrm{HML}_{\mathrm{af}}$), the earnings-to-prices spread ($\mathrm{EP}_{\mathrm{spread}}$), or the cash-flows-to-prices spread ($\mathrm{CFP}_{\mathrm{spread}}$). $\mathrm{EP}_{\mathrm{spread}}$ and $\mathrm{CFP}_{\mathrm{spread}}$ are the difference between the 10th and the 1st decile sorted-portfolio returns, available on Kenneth French's webpage. Data are yearly on the sample 1963-2013. Reported t-statistics are heteroscedasticity robust. Symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	Without Duration Premium			With Duration Premium		
	α	t-stat	adj-R^2	α	t-stat	adj-R^2
$\mathrm{HML}_{\mathrm{af}}$	0.052***	2.83	0.29	-0.011	-0.56	0.54
$\mathrm{EP}_{\mathrm{spread}}$	0.091***	4.81	0.01	0.001	0.06	0.48
$\mathrm{CFP}_{\mathrm{spread}}$	0.111***	6.71	0.10	0.023	1.50	0.62

3 Model

3.1 Aggregate Economy

The economy is structured as follows. A representative firm produces a cash-flows stream, which can be interpreted as the after-investment output of production: $C = Y - I$. Such a stream represents the total resources: workers receive wages (W) and shareholders receive dividends (D). The resource constraint requires $C = W + D$. To keep the model simple, I assume limited market participation in spirit of Berk and Walden (2013): on the one hand, workers do not access the financial markets and consume their wages; on the other hand, shareholders act as a representative agent on the stock market and consume dividends.[10]

Shareholders feature recursive preferences in spirit of Kreps and Porteus (1979), Epstein and Zin (1989), Weil (1989), and Duffie and Epstein (1992). These preferences allow for the separation between the elasticity of intertemporal substitution and the coefficient of relative risk aversion. Given a consumption process $\hat{C}$, the utility at each time t is defined as

$$U_t \equiv \left[(1-\beta^{dt})\hat{C}_t^{\frac{1-\gamma}{\theta}} + \beta^{dt}\mathbb{E}_t\left(U_{t+dt}^{1-\gamma}\right)^{\frac{1}{\theta}}\right]^{\frac{\theta}{1-\gamma}}, \tag{1}$$

where β is the time discount factor, γ is the coefficient of risk aversion, ψ is the elasticity of intertemporal substitution, and $\theta = \frac{1-\gamma}{1-\frac{1}{\psi}}$.

Aggregate consumption dynamics are modelled as the product of two shocks. A permanent shock x_t features time-variation in expected growth, μ_t, and induces an upward-sloping effect on the term-structure of risk (i.e. the growth rates' variance or variance ratio for C_t). A transitory shock z_t captures business cycle uncertainty and induces a downward-sloping effect. The two shocks jointly allow for flexible term-structures of risk. Namely, aggregate consumption $C_t = e^{x_t - z_t}$ has dynamics given by:

$$d\log C_t = dx_t - dz_t, \tag{2}$$

$$dx_t = \mu_t dt + \sigma_x dB_{x,t}, \tag{3}$$

$$d\mu_t = \lambda_\mu(\bar{\mu} - \mu_t)dt + \sigma_\mu dB_{\mu,t}, \tag{4}$$

$$dz_t = \lambda_z(\bar{z} - z_t)dt + \sigma_z\sqrt{z_t/\bar{z}}\,dB_{z,t}, \tag{5}$$

Brownian shocks are independent for the sake of exposition and tractability.

Aggregate consumption, wages and dividends are co-integrated in levels (Lettau and Lud-

[10] Berk and Walden (2013) show that limited market participation obtains endogenously because labor markets provide risk-sharing to workers. Although unnecessary to the main results of the paper, the assumption of limited market participation allows for tractability and for comparability with endowment economy asset pricing models.

vigson, 2005). Then, their dynamics share the permanent shock x_t. Labor rigidity, ϕ, concerns the transitory risk of wages and induces a leverage effect on dividends:

$$W_t = C_t\omega(z_t) = e^{x_t - z_t} - \bar{\delta} e^{x_t-(1+\phi)z_t}, \tag{6}$$

$$D_t = C_t\,\delta(z_t) = \bar{\delta} e^{x_t-(1+\phi)z_t}, \tag{7}$$

where $\delta(z_t) = 1-\omega(z_t)$, $\bar{\delta} \in (0,1)$, and $\phi \geq 0$. Beyond co-integration and excess volatility, these dynamics capture (i) the heterogeneity in the term-structure of risk of consumption, wages and dividends (Marfè, 2015), (ii) the cyclicality of the labor-share ($\omega'(z_t) > 0$) and dividend-share ($\delta'(z_t) < 0$) (e.g. Boldrin and Horvath (1995); Ríos-Rull and Santaeulàlia-Llopis (2010)), and (iii) the dynamic relation between the labor-share and both wages and dividends variance ratios (Marfè, 2015).

The above dynamics can be understood as a result of the "distributional risk" between shareholders and workers, due to labor rigidity:

$$|\partial_z \log W_t| \;<\; 1 \;<\; |\partial_z \log D_t|\,.$$

After a negative transitory shock ($z_t > 0$), workers get partial insurance because the fraction of total resources devoted to wages increases. Instead, shareholders suffer more since the dividend-share decreases. Such a mechanism of insurance has two main implications. First, insurance ($\phi > 0$) makes dividends riskier in bad times and therefore provides a rationale for a high equity premium. Second, jointly with co-integration, insurance ($\phi > 0$) induces term-structures of risk for dividends and wages that are respectively decreasing and increasing with the horizon.

Recursive preferences lead to a non-affine state-price density. Therefore, to solve for prices and preserve analytic tractability, I follow the methodology presented by Eraker and Shaliastovich (2008), which is based on the Campbell and Shiller (1988) log-linearization. The discrete time (continuously compounded) log-return on equity P_t (e.g., the claim on the shareholders' consumption D_t) can be expressed as

$$\log R_{t+1} = \log \frac{P_{t+1} + D_{t+1}}{P_t} = \log\left(e^{pd_{t+1}} + 1\right) - pd_t + \log \frac{D_{t+1}}{D_t},$$

where $pd_t = \log(P_t/D_t)$. A log-linearization of the first summand around the mean log price-dividend ratio leads to

$$\log R_{t+1} \approx k_0 + k_1 pd_{t+1} - pd_t + \log \frac{D_{t+1}}{D_t},$$

where the endogenous constants k_0 and k_1 satisfy

$$k_0 = -\log\left((1-k_1)^{1-k_1} k_1^{k_1}\right) \qquad \text{and} \qquad k_1 = e^{\mathbb{E}(pd_t)} / \left(1 + e^{\mathbb{E}(pd_t)}\right).$$

Campbell, Lo, and MacKinlay (1997) and Bansal, Kiku, and Yaron (2012) show the high accuracy of such a log-linearization, which I assume exact hereafter. I follow Eraker and Shaliastovich (2008) and consider the continuous time counterpart defined as:

$$d\log R_t = k_0 dt + k_1 d(pd_t) - (1-k_1) pd_t dt + d\log D_t. \tag{8}$$

Recursive preferences lead to the following Euler equation, which enables us to characterize the state-price density, M_t, used to price any asset in the economy:

$$\mathbb{E}_t\left[\exp\left(\log\frac{M_{t+\tau}}{M_t} + \int_t^{t+\tau} d\log R_s\right)\right] = 1. \tag{9}$$

The state-price density satisfies

$$d\log M_t = \theta\log\delta dt - \frac{\theta}{\psi} d\log D_t - (1-\theta) d\log R_t. \tag{10}$$

To solve for the return on equity and, in turn, on the state-price density, one has to conjecture that pd_t is affine in the vector of state variables $(x_t, \mu_t, z_t)^\top$. Then, the Euler equation is used to solve for the coefficients. Namely, the state-price density has dynamics:

$$\frac{dM_t}{M_t} = -r_t dt - \Omega_x \sigma_x dB_{x,t} - \Omega_\mu \sigma_\mu dB_{\mu,t} - \Omega_z \sigma_z \sqrt{z_t/\bar{z}} dB_{z,t}, \tag{11}$$

where

$$r_t = r_0 + r_\mu \mu_t + r_z z_t,$$

and

$$\Omega_x = \gamma, \qquad \Omega_\mu = (1-\theta) k_1 a_\mu, \qquad \Omega_z = -\gamma(1+\phi) + (1-\theta) k_1 a_z.$$

The equity price is given by

$$P_t = \int_0^\infty \mathbb{E}_t\left[\frac{M_{t+\tau}}{M_t} D_{t+\tau}\right] d\tau = e^{x_t + a_0 + d_0 + a_\mu \mu_t + (a_z - (1+\phi)) z_t}, \tag{12}$$

where

$$a_\mu = \frac{1 - 1/\psi}{1 - k_1(1-\lambda_\mu)}, \qquad a_z = -\frac{\theta}{k_1^2 \lambda_z^2} \sqrt{\Phi_1^2 + \Phi_2} - \Phi_1,$$

with

$$\Phi_1 = 1+k_1(\lambda_z - 1 + (1+\phi)(1-\gamma)\sigma_z^2/\bar{z}), \qquad \Phi_2 = k_1(\gamma-1)(1+\phi)(\sigma_z^2/\bar{z})(2\lambda_z - (1+\phi)(\gamma-1)\sigma_z^2/\bar{z}).$$

For $\psi > 1$ and plausible risk aversion, $\Omega_z < 0$ and $a_z > 0$: business cycle uncertainty is positively priced in equilibrium and prices decline during business cycle downturns. Moreover, the magnitude of these effects is amplified by labor rigidity ϕ.

Therefore, return variance and equity premium are given by

$$\begin{aligned} \sigma_R^2(t) &= \sigma_x^2 + a_\mu^2 \sigma_\mu^2 + (a_z - (1+\phi))^2 \sigma_z^2 \left(\frac{z_t}{\bar{z}}\right), \\ pr_R(t) &= \Omega_x \sigma_x^2 + \Omega_\mu \sigma_\mu^2 a_\mu + \Omega_z \sigma_z^2 (a_z - (1+\phi)) \left(\frac{z_t}{\bar{z}}\right). \end{aligned}$$

Both return variance and equity premium increase with business cycle uncertainty.

The price of the dividend strip with maturity τ is defined as the integrand of Eq. (12) and has exponential affine solution:

$$P_{t,\tau} = e^{a_0(\tau) + x_t + a_\mu(\tau)\mu_t + a_z(\tau) z_t},$$

where the deterministic functions $a_0(\tau), a_\mu(\tau)$, and $a_z(\tau)$ solve a system of ODEs. The term-structures of dividend strip return volatility and premia simply obtain by an application of Itô's Lemma.

3.2 Cross-sectional Returns

Now the focus turns on cross-sectional returns. In spirit of Lynch (2003) and Menzly, Santos, and Veronesi (2004), I define a share process for the dividends paid by a firm or a portfolio of firms, D_t^i, that is the fraction of aggregate dividends paid by the firm or portfolio i:

$$D_t^i = D_t s(z_t, y_t; i),$$

where

$$s(z_t, y_t; i) = g(T_i) e^{-\rho_i z_t + \eta_i y_t}, \tag{13}$$

with

$$\begin{aligned} g(T_i) &= \left(\frac{\pi}{2T^{\max}} \sin\left(\frac{\pi T_i}{T^{\max}}\right)\right), \\ dy_t &= -\lambda_y y_t dt + \sigma_y dB_{y,t}, \end{aligned}$$

$T_i \in (0, T^{\max})$, $\rho_i \in (\rho_l, \rho_h)$, and $\eta_i \in (\eta_l, \eta_h)$.[11]

Namely, I consider three sources of cross-sectional heterogeneity. First, the function $g(T_i)$ represents a continuous-time counterpart of the deterministic life-cycle process by Lettau and Wachter (2007, 2011). T_i can be interpreted as the residual life and $g(T_i)$ is hump-shaped with maximum at $T^{\max}/2$. Second, the coefficient ρ_i captures the firm-specific or portfolio-specific exposition to business cycle uncertainty. Finally, the coefficient η_i captures the firm-specific or portfolio-specific exposition to an unpriced shock y_t. Since both z_t and y_t are stationary, the coefficients ρ_i and η_i can be eventually interpreted as leverage effects of cross-sectional heterogeneity in labor rigidity.

As it will be shown later, a positive duration/value premium and its relation with the labor-share obtain even in the simple case $\rho_i = \eta_i = 0$. In such a case, dividend volatility computed over any horizon τ is identical for firms/portfolios with any residual life T_i as well as for aggregate dividends:

$$\sigma_i^2(t,\tau) = \sigma_j^2(t,\tau), \ \ \forall \tau < \min(T_i, T_j), \quad \text{with} \quad \sigma_i^2(t,\tau) = \frac{1}{\tau} \log \frac{\mathbb{E}_t[(D^i_{t+\tau})^2]}{\mathbb{E}_t[D^i_{t+\tau}]^2}.$$

A positive duration/value premium obtains because labor rigidity shifts risk towards the short-horizon and firms/portfolios whose cash-flows concentrate at short horizons deserve a compensation over firms/portfolios whose cash-flows are paid out over a longer horizon. In turn, the current level of the labor-share positively predicts such a compensation. Cross-sectional heterogeneity in the coefficient ρ_i amplifies the magnitude of the above mechanism as long as firms/portfolios with shorter residual life (low T_i) are associated with larger exposition with business cycle uncertainty (high ρ_i). Finally cross-sectional heterogeneity in the coefficient η_i allows to capture the empirical finding that return volatility of duration-sorted portfolios is not monotone decreasing with duration.

The price of the firm/portfolio i is given by

$$P_t^i = \int_0^{T_i} \mathbb{E}_t \left[\frac{M_{t+\tau}}{M_t} D_{t+\tau} g(T_i - \tau) e^{-\rho_i z_{t+\tau} + \eta_i y_{t+\tau}} \right] d\tau \tag{14}$$

$$= \int_0^{T_i} e^{a_0(\tau,i) + x_t + a_\mu(\tau,i)\mu_t + a_z(\tau,i) z_t + a_y(\tau,i) y_t} d\tau \tag{15}$$

where the deterministic functions $a_0(\tau,i)$, $a_\mu(\tau,i)$, $a_z(\tau,i)$, and $a_y(\tau,i)$ satisfy a system of ODEs.

[11] In order to have $\int_{\mathcal{I}} s(z_t, y_t; i) di = 1$, $\forall t$, one needs to replace $e^{-\rho_i z_t + \eta_i y_t}$ with $\frac{e^{-\rho_i z_t + \eta_i y_t}}{\int_{\mathcal{I}} e^{-\rho_i z_t + \eta_i y_t} di}$. Since z_t and y_t are stationary, $\left(\int_{\mathcal{I}} e^{-\rho_i z_t + \eta_i y_t} di\right)^{-1}$ can be well approximated by a weighted sum of exponential affine functionals (i.e., a series expansion around the steady-state of e^{z_t} and e^{y_t}). This approximation guarantees tractability to the price of the claim on D_t^i. Since the main results are not affected by this adjustment, I use the share process in Eq. (13) for the sake of simplicity and exposition.

The return variance and premium on the firm/portfolio i are given by

$$\sigma^2_{R,i}(t) = \|(\nabla \log P^i_t) \cdot (\sigma_x, \sigma_\mu, \sigma_z\sqrt{z_t/\bar{z}}, \sigma_y)^\top\|, \tag{16}$$

$$pr_{R,i}(t) = \Omega_x\sigma_x^2(\partial_x \log P^i_t) + \Omega_\mu\sigma_\mu^2(\partial_\mu \log P^i_t) + \Omega_z\sigma_z^2(z_t/\bar{z})(\partial_z \log P^i_t). \tag{17}$$

The cash-flow duration for the firm/portfolio i is given by the time integral of each horizon $\tau \in (0, T_i)$ weighted by the price of the cash-flows at τ relative to the price of the firm/portfolio i:

$$\mathcal{D}^i_t = (P^i_t)^{-1}\int_0^{T_i} \mathbb{E}_t\left[\tau\,\frac{M_{t+\tau}}{M_t} D^i_{t+\tau}\right] d\tau \tag{18}$$

$$= (P^i_t)^{-1}\int_0^{T_i} \tau\, e^{a_0(\tau,i)+x_t+a_\mu(\tau,i)\mu_t+a_z(\tau,i)z_t+a_y(\tau,i)y_t} d\tau \tag{19}$$

The simple case $\rho_i = \eta_i = 0$ is illustrative of the model predictions about the duration/value premium. Define the premium simply as the differential in the compensations associated with firms/portfolios featuring short and long durations: $T_{\text{value}} \ll T_{\text{growth}}$. The duration/value premium can be written as

$$\Pi(t) = pr_{R,\text{value}}(t) - pr_{R,\text{growth}}(t) \tag{20}$$

$$= \underbrace{\Omega_\mu\sigma_\mu^2\partial_\mu(\log P^{\text{value}}_t - \log P^{\text{growth}}_t)}_{\Pi_\mu(t),\text{ long-run risk component}} + \underbrace{\Omega_z\sigma_z^2(z_t/\bar{z})\partial_z(\log P^{\text{value}}_t - \log P^{\text{growth}}_t)}_{\Pi_z(t),\text{ short-run risk component}}. \tag{21}$$

The components $\Pi_\mu(t)$ and $\Pi_z(t)$ capture the differential of the price elasticities with respect to μ_t and z_t between firms/portfolios with short and long duration. Under standard preferences ($\gamma > \psi > 1$), the long-run risk component is negative and the short-run risk component is positive. The latter increases with labor rigidity and gives rise to a positive duration/value premium for ϕ large enough. Moreover, $\Pi_z(t)$ increases with z_t, that is the duration/value premium is counter-cyclical.

4 Discussion

4.1 Aggregate Economy

Cash-flows parameters $\{\sigma_x, \bar{\mu}, \lambda_\mu, \sigma_\mu, \bar{z}, \lambda_z, \sigma_z, \bar{\delta}, \phi\}$ are set to match some moments from the time-series of consumption, wages and dividends growth rates. Then, preference parameters are set to provide a good fit of standard asset pricing moments. Similarly to Marfè (2015), the calibration procedure exploits information from the term-structures of cash-flow variance ratios to assess the strength of labor rigidity and its leverage and term-structure effects.

Table 10 reports the model parameters and many empirical and model-implied moments. The model dynamics are flexible and accurately match the growth rate of consumption (2%)

Table 10: Calibration of Aggregate Cash-Flows

Parameters

σ_x	$\bar{\mu}$	λ_μ	σ_μ	$\bar{z}$	λ_z	σ_z	δ	ϕ
0.005	0.02	0.70	0.015	0.15	0.20	0.026	0.159	6.5

Cash-flows moments	Data	Model
Long-run growth	0.020	0.020
One year consumption volatility	0.025	0.025
One year dividends volatility	0.174	0.173
Dividend-share average (D/(D+W))	0.060	0.060
Dividend-share volatility	0.016	0.016

Variance ratios

Horizon	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Consumption														
Data	0.931	0.979	0.959	0.821	0.785	0.735	0.758	0.754	0.767	0.751	0.810	0.833	0.868	0.912
Model	0.967	0.954	0.943	0.932	0.919	0.907	0.896	0.886	0.877	0.869	0.862	0.856	0.850	0.845
Wages														
Data	1.231	1.327	1.429	1.485	1.491	1.504	1.519	1.581	1.632	1.632	1.603	1.556	1.544	1.573
Model	1.161	1.313	1.429	1.513	1.573	1.616	1.648	1.672	1.69	1.705	1.717	1.727	1.735	1.742
Dividends														
Data	0.550	0.401	0.264	0.254	0.231	0.239	0.174	0.170	0.168	0.167	0.168	0.162	0.161	0.162
Model	0.811	0.673	0.569	0.490	0.427	0.378	0.338	0.305	0.278	0.256	0.236	0.220	0.205	0.193

and its volatility (2.5%). The model captures the excess volatility of dividends (17.4%), the average level of the dividend-share (6%) and its volatility (1.6%), that is the ratio of net dividends over the sum of net dividends and wages from the US non-financial corporate sector. In addition, the model fits well the shape of the term-structures of variance ratios of consumption (NIPA nondurables and services), wages and dividends. Namely, the joint dynamics of μ_t and z_t lead to flat variance ratios in line with consumption data. The labor rigidity parameter ϕ induces both the rise and decline of respectively wage and dividend risk with the horizon. This term-structure effect recovers the shape of the empirical term-structures of variance ratios. The left panel of Figure 4 reports the empirical and the model implied term-structures of variance ratios: long-horizon dividend risk is about five times lower than short-horizon dividend risk as a result of long-horizon wage risk about one half higher than short-horizon wage risk. The right panel of Figure 4 shows the implied levels of consumption, wages and dividends volatility.

I set shareholders' preferences to standard parameters $\gamma = 7.5, \psi = 1.25$, and $\beta = 0.96$. Thus, they have preference for the early resolution of uncertainty ($\gamma > 1/\psi$) and the intertemporal substitution effect dominates the wealth effect ($\psi > 1$), as in most of the asset pricing literature.

Table 11 reports standard asset pricing moments for both the baseline calibration and the

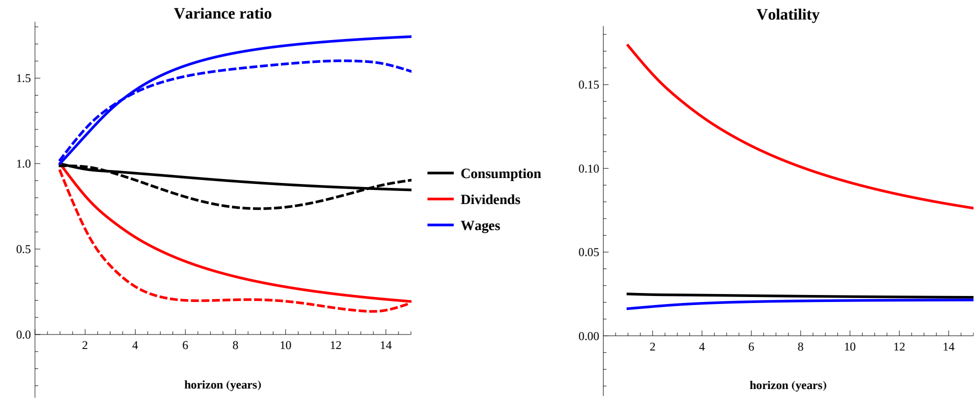

Figure 4: Term-structures of consumption, wages, and dividends

Left panel: Variance-ratios of wages (blue), consumption (black) and dividends (red) as a function of the horizon. Dashed lines denote empirical data. Right panel: Volatility of wages (blue), consumption (black) and dividends (red) as a function of the horizon. Parameters are from Table 10.

economy without labor rigidity ($\phi = 0$), as well as their empirical counterparts.

Table 11: Aggregate Asset Pricing Moments

Parameters

β	γ	ψ
0.96	7.5	1.25

Moments	Data		Model	
	1931-2009	1947-2009	$\phi = 6.5$	$\phi = 0$
Risk-free rate (%)	0.60	1.00	0.75	5.55
Risk-free rate volatility (%)	3.00	2.70	2.57	1.27
Equity premium (%)	6.20	6.30	6.35	0.18
Equity volatility (%)	19.8	17.6	16.3	2.3
Sharpe ratio (%)	31.3	35.8	39.0	8.0
Log price-dividend ratio	3.38	3.47	3.25	3.27
Log price-dividend ratio volatility (%)	45.0	42.9	39.6	0.8

The model provides a good fit: the average risk-free rate of 0.7% with 2.6% volatility. The equity premium is 6.3% as in actual data, while return volatility 16.3% is slightly lower than its empirical counterpart. In turn, the Sharpe ratio 39% is somewhat above actual data. The price-dividend ratio is about 3.25 with 40% volatility. Labor rigidity is key to generate these results. Instead, for $\phi = 0$ the model cannot generate a high equity premium and return volatility, and the risk-free rate is far higher than in actual data.[12]

The model has interesting predictions about dividend strips. As in Marfè (2015), labor

[12] Beyond the good fit of unconditional moments, the model has some limitations such as the excessive predictability of excess returns and growth rates by prices. This can be fixed by introducing unpriced shocks in the model, which is instead kept simple in order to point out the economic mechanism linking labor-share variation and duration/value premium.

rigidity enhances transitory dividend risk as well as the equilibrium price for such a risk. In turn, dividend strip return volatility and premium are both downward-sloping and are both increasing with the labor-share. These results are displayed in Figure 5.

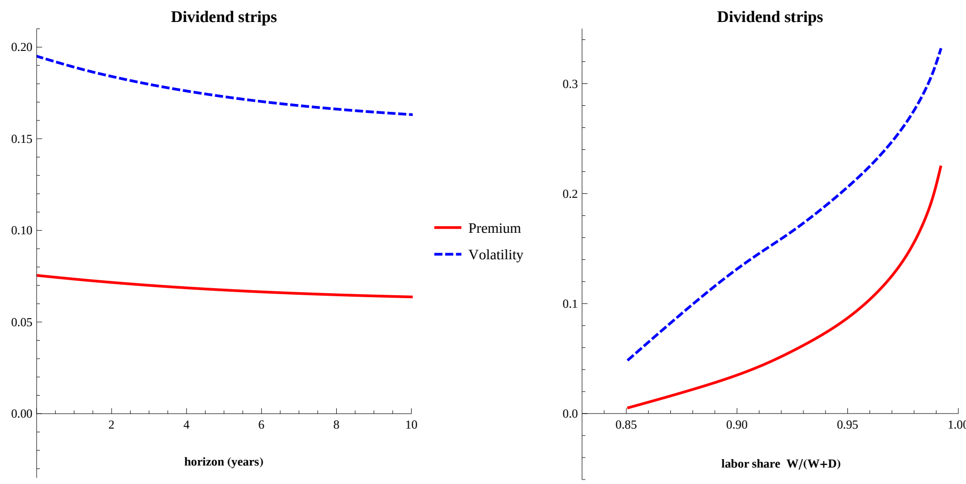

Figure 5: Labor-share and dividend strip return volatility and premium

Left panel: Dividend strip return volatility (dashed line) and premium (solid line) as a function of maturity. Right panel: One-year maturity dividend strip return volatility (dashed line) and premium (solid line) as a function of the labor-share.

The slope of dividend strip premia is relatively tiny but realistic: the average excess return of dividend strips up to 5 years maturity over the market return is about 0.8%. The empirical counterpart is similar: 1.2%, as documented by van Binsbergen and Koijen (2016). Moreover, consistently with van Binsbergen, Hueskes, Koijen, and Vrugt (2013) and Aït-Sahalia, Karaman, and Mancini (2015), the slope of the premium is pro-cyclical: it is about flat in good times (low z_t) and markedly negative in bad times (high z_t).

4.2 Cross-sectional Returns

4.2.1 Simple Case

This section investigates the model predictions about cross-sectional returns when the only source of firm heterogeneity is the residual life in a deterministic life-cycle ($\rho_i = \eta_i = 0$). The only additional parameter is $T^{\max}$ that is set to 50 years as in Lettau and Wachter (2007). The upper left panel of Figure 6 displays the valuation ratios $\log P_t^i/D_t^i$. Since they are increasing with residual life, we interpret firms with small T_i as value firms and firms with large T_i as growth firms. The upper right panel shows that value and growth firms feature respectively short and long duration of cash-flows. Finally, the lower panels show the return volatility and premium: both are increasing with T_i.

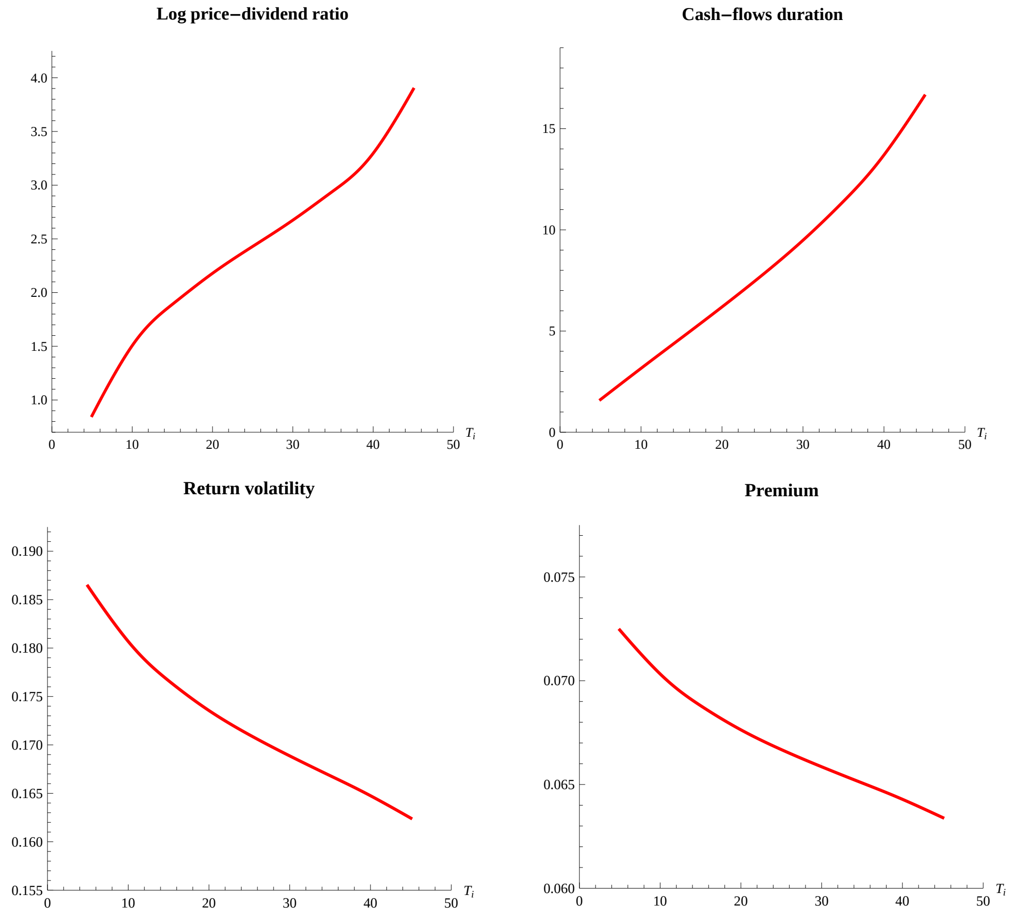

Figure 6: Cross-sectional returns

Cash-flow duration (upper left panel), log price-dividend ratio (upper right panel), return volatility (lower left panel), and premium (lower right panel) as a function of residual life T_i.

Therefore, the model leads to a positive duration and value premium, consistently with empirical findings by Dechow, Sloan, and Soliman (2004) and Weber (2016).

The empirical analysis of Section 2 documents a positive intertemporal relation between the labor-share and the duration/value premium: Figure 7 shows that the model leads to the same prediction. After a negative transitory shock (high z_t), the labor-share increases because workers are partially insured and shareholders are hit more. This shifts dividend risk towards the short-horizon and increases the market compensation for short-run risk. In turn, shorter duration firms deserve a larger compensation than longer duration firms. Finally, the price of the former (relative to fundamentals) declines in comparison with the price of the latter (relative to fundamentals).

In this simple setting, a positive duration/value premium obtains because *aggregate* labor rigidity alters the timing of risk and its equilibrium price. Note that heteroscedasticity in business cycle uncertainty z_t leads to time-varying price of risk and, in turn, it quantitatively helps to produce counter-cyclical variation of the duration/value premium. However, neither heteroscedasticity nor cross-sectional heterogeneity in labor rigidity are necessary to the economic mechanism induced by *aggregate* labor rigidity.

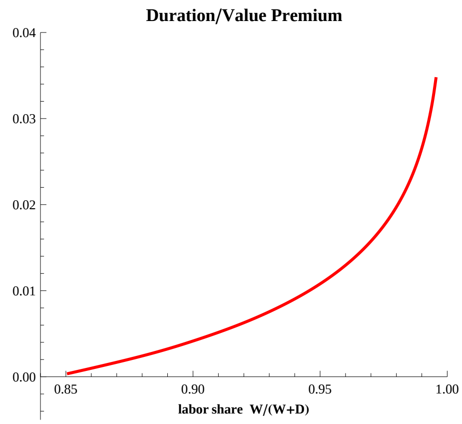

Figure 7: Labor-share and duration/value premium

Duration/value premium as a function of the labor-share. The premium is defined as the premium of the firm/portfolio with residual life $T_{\text{value}} = 5$ years minus the premium of the firm/portfolio with residual life $T_{\text{growth}} = 45$ years.

4.2.2 General Case

This section investigates the model predictions about cross-sectional returns when, in addition to the deterministic life-cycle, firms/portfolios are heterogeneous also with respect their exposition to business cycle uncertainty z_t and to an unpriced transitory shock y_t.

In order to characterize cross-sectional returns in a parsimonious way that is comparable with the empirical evidence, I make the following assumptions about the firm-specific parameters:

$$\begin{aligned} T_i &= T_a + T_b \times i, \\ \rho_i &= \rho_a + \rho_b \times i, \qquad\qquad \forall i = 1, \ldots, N, \\ \eta_i &= \eta_a + \eta_b \times i. \end{aligned}$$

Parameters $\{T_a, T_b, \rho_a, \rho_b, \eta_a, \eta_b\}$ and parameters $\{\lambda_y, \sigma_y\}$, which governs the dynamics of y_t, can be set to generate a rich set of predictions about the cross-sectional moments from N firms/portfolios, such as their cash-flows duration, return volatility, premium, and valuation ratio.

I consider the monthly returns of decile portfolios of firms sorted by cash-flow duration from Weber (2016). I compute log-returns and I aggregate at yearly frequency on the sample 1964-

2013. Then, I compute the average return of each portfolio D1,. . . , D10 over the average return of the longest cash-flow duration portfolio D10. These computations provide a term-structure of the duration premium which is monotone decreasing. I also compute the return volatility for each portfolio: the term-structure is U-shaped with the duration. This suggests that longer cash-flow duration portfolios are subject to larger idiosyncratic volatility than shorter cash-flow duration portfolios. The cash-flow duration of these portfolios ranges between 6 and 24 years. Duration premia and portfolio return volatility are reported in Table 12.

Table 12: Portfolios sorted by cash-flow duration

Premium

D1-D10	D2-D10	D3-D10	D4-D10	D5-D10	D6-D10	D7-D10	D8-D10	D9-D10	
0.156	0.136	0.124	0.113	0.106	0.102	0.082	0.065	0.048	–

Volatility

D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
0.276	0.250	0.234	0.228	0.229	0.237	0.246	0.260	0.300	0.375

I calibrate the model in order to produce a stylized representation of these term-structures of the duration premium and return volatility over the relevant range of cash-flow duration of 6-24 years. Figure 8 provides a number of insights. The figure reports the log price-dividend ratio (upper panel), the return volatility (middle panel) and the excess expected return of each portfolio over the portfolio with longest duration (lower panel) as a function of the cash-flow duration. Consistently with actual data, the model captures that (i) valuation ratios are increasing with duration, (ii) return volatility is a U-shaped function of duration, and (iii) return premium is decreasing with duration.

Finally, Figure 9 shows that the duration premium, computed as the excess expected return of the portfolio with shortest duration over the portfolio with longest duration, is increasing with the labor-share, in line with the empirical evidence.

Although the simplistic model, these results suggest that the term-structure effect of aggregate labor rigidity and cross-sectional heterogeneity in (priced and unpriced) transitory risk (e.g. due to cross-sectional heterogeneity in labor rigidity) can jointly help to understand risk and return of duration sorted portfolios and, in turn, their implications for the value premium dynamics.

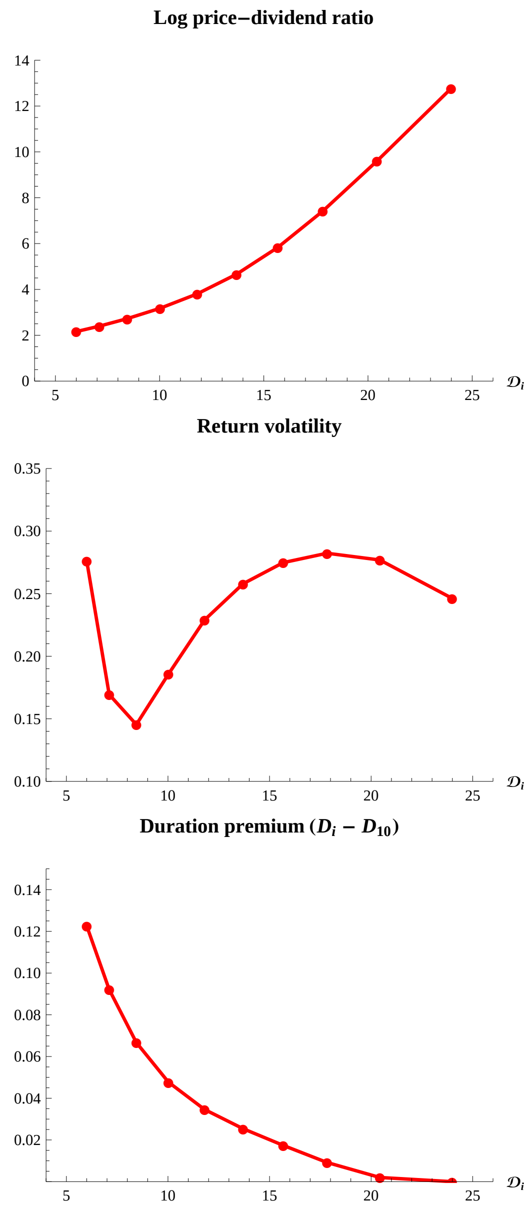

Figure 8: Cross-sectional returns

Cross-sectional log price-dividend ratio (upper panel), return volatility (middle panel) and the excess expected return of each portfolio over the portfolio with longest duration (lower panel) as a function of the cash-flow duration. Aggregate cash-flows parameters are from Table 10. Cross-sectional parameters are: $T^{\max} = 50, \lambda_y = 0.1, \sigma_y = 0.25, T_a = 16.6, T_b = 2.8, \rho_a = 13, \rho_b = -6.6, \eta_a = -1.6, \eta_b = 0.8$.

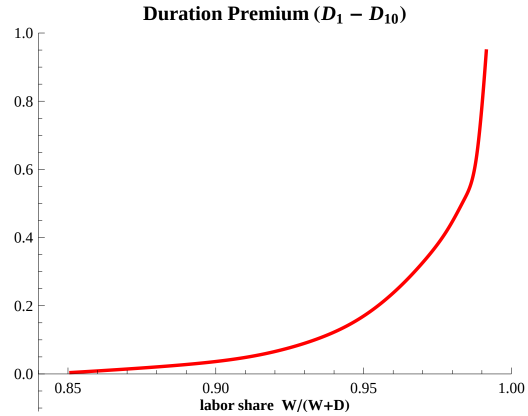

Figure 9: Duration premium and labor-share

Excess expected return of the portfolio with shortest duration over the portfolio with longest duration as a function of the aggregate labor-share. Aggregate cash-flows parameters are from Table 10. Cross-sectional parameters are: $T^{\max} = 50, \lambda_y = 0.1, \sigma_y = 0.25, T_a = 16.6, T_b = 2.8, \rho_a = 13, \rho_b = -6.6, \eta_a = -1.6, \eta_b = 0.8$.

5 Conclusion

This paper documents that (i) variation in the labor-share largely forecasts the value premium, and (ii) this relation results from a duration premium induced by labor rigidity. A simple general equilibrium model rationalizes these stylized facts: aggregate labor rigidity mostly concerns transitory risk and gives rise to downward-sloping dividend and equity risk. In turn, (i) shorter cash-flow duration firms deserve a premium over longer cash-flow duration firms and (ii) shorter cash-flow duration firms feature lower prices relative to fundamentals than longer cash-flow duration firms. Thus, the economy captures the connection between labor-share, duration premium, and value premium dynamics observed in actual data.

The term-structure effect of labor rigidity provides a potential macroeconomic explanation for the empirical findings about cash-flow duration (Dechow, Sloan, and Soliman, 2004; Weber, 2016) and for the partial equilibrium framework by Lettau and Wachter (2007, 2011). A calibration –which exploits information from the term-structures of macroeconomic risk– captures the dynamic relation between the labor-share and the value premium, as well as reconciles standard asset pricing facts with the term-structures of both equity and macroeconomic variables.

Appendix: Proofs

The dynamics for consumption in Eq. (2)-(3)-(4)-(5) and the dynamics for dividends $d \log D_t = dx_t - (1+\phi)dz_t$ belong to the affine class and can be written using a vector $Y_t = (x_t, \mu_t, z_t)^\top$ and the notation:

$$dY_t = \mu(Y_t)dt + \Sigma(Y_t)dB_t \tag{A1}$$
$$\mu(Y_t) = \mathcal{M} + \mathcal{K}Y_t \tag{A2}$$
$$\Sigma(Y_t)\Sigma(Y_t)^\top = h + \sum_{i=1}^{3} H_i Y_t^i, \qquad i = \{x, \mu, z\}, \tag{A3}$$

where

$$\mathcal{M} = (-\sigma_x^2/2, \lambda_\mu \bar{\mu}, \lambda_z \bar{z})^\top,$$
$$\mathcal{K} = \begin{pmatrix} 0 & 1 & 0 \\ 0 & -\lambda_\mu & 0 \\ 0 & 0 & -\lambda_z \end{pmatrix},$$
$$h = \begin{pmatrix} \sigma_x^2 & 0 & 0 \\ 0 & \sigma_\mu^2 & 0 \\ 0 & 0 & 0 \end{pmatrix},$$
$$H_z = \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & \sigma_z^2(z_t/\bar{z}) \end{pmatrix},$$

H_x and H_μ are zeros and $B_t = (B_{x,t}, B_{\mu,t}, B_{z,t})^\top$. And consumption and dividend dynamics obtain with the selection vectors $\delta_c = (1, 0, -1)^\top$ and $\delta_d = (1, 0, -(1+\phi))^\top$.

The moment generating function of log consumption and dividend have exponential affine solution:

$$\mathbb{E}_t[V_{t+\tau}^u] = e^{b_0(\tau,u)+b_x(\tau,u)x_t+b_\mu(\tau,u)\mu_t+b_z(\tau,u)z_t}, \qquad V = \{C_t, D_t\}.$$

Following Duffie, Pan, and Singleton (2000), the coefficients $b_0(\tau, u)$ and $b(\tau, u) = (b_x(\tau, u), b_\mu(\tau, u), b_z(\tau, u))^\top$ can be derived solving a system of ordinary differential equations:

$$b'(\tau; u) = \mathcal{K}^\top b(\tau; u) + \frac{1}{2} b(\tau; u)^\top H b(\tau; u) \tag{A4}$$
$$b_0'(\tau; u) = \mathcal{M}^\top b(\tau; u) + \frac{1}{2} b(\tau; u)^\top h b(\tau; u), \tag{A5}$$

subject to $b_0(0; u) = 0$ and $b(\tau; u) = (u, 0, -u)^\top$ for consumption and $b(\tau; u) = (u, 0, -(1+\phi)u)^\top$ for dividends.

Following Eraker and Shaliastovich (2008), the state-price density satisfies

$$d\log M_t = (\theta \log\beta - (\theta - 1)\log k_1 + (\theta - 1)(k_1 - 1)A'(Y_t - \mu_Y)dt - \Omega' dY_t, \tag{A6}$$

where $\mu_Y = (0, \bar{\mu}, \bar{z})^\top$, $A = (a_x, a_\mu, a_z)^\top$, and $\Omega = (\Omega_x, \Omega_\mu, \Omega_z)^\top = \gamma\delta_d^\top + (1-\theta)k_1 A$.

The equity price equals shareholders' wealth and is given by $P_t = D_t e^{a_0 + A^\top Y_t}$. The coefficients

a_0 and A solve the following system of equations:

$$0 = \mathcal{K}^\top \chi - \theta(1-k_1)A + \frac{1}{2}\chi^\top H \chi \tag{A7}$$

$$0 = \theta(\log\beta + k_0 - (1-k_1)a_0) + \mathcal{M}^\top \chi + \frac{1}{2}\chi^\top h \chi \tag{A8}$$

$$\theta \log k_1 = \theta(\log\beta + (1-k_1)A^\top \mu_Y) + \mathcal{M}^\top \chi + \frac{1}{2}\chi^\top h \chi, \tag{A9}$$

where $\chi = \theta\left((1-\frac{1}{\psi})\delta_d^\top + k_1 B_c\right)$ and $k_0 = -\log\left((1-k_1)^{1-k_1}k_1^{k_1}\right)$. The risk-free rate has form $r_t = \Phi_0 + \Phi^\top Y_t$ where the coefficient satisfy

$$\Phi = (1-\theta)(k_1-1)A + \mathcal{K}^\top \Omega - \frac{1}{2}\Omega^\top H \Omega \tag{A10}$$

$$\Phi_0 = -\theta\log\beta + (\theta-1)(\log k_1 + (k_1-1)A^\top \mu_Y) + \mathcal{M}^\top \Omega - \frac{1}{2}\Omega^\top h \Omega. \tag{A11}$$

The dividend strip with maturity τ has price given by $P_{t,\tau} = e^{a_0(\tau)+a(\tau)^\top Y_t}$. Following Eraker and Shaliastovich (2008), the deterministic functions $a_0(\tau)$ and $a(\tau) = (a_x(\tau), a_\mu(\tau), a_z(\tau))$ solve the following system of ordinary differential equations:

$$a'(\tau) = -\Phi + \mathcal{K}^{\mathbb{Q}\top} a(\tau) + \frac{1}{2}a(\tau)^\top H a(\tau) \tag{A12}$$

$$a_0'(\tau) = -\Phi_0 + \mathcal{M}^{\mathbb{Q}\top} a(\tau) + \frac{1}{2}a(\tau)^\top h a(\tau) \tag{A13}$$

subject to $a_0(0) = \log\bar{\delta}$ and $a(0) = (1, 0, -(1+\phi))^\top$. The coefficients $\mathcal{M}^{\mathbb{Q}}$ and $\mathcal{K}^{\mathbb{Q}}$ satisfy

$$\mathcal{M}^{\mathbb{Q}} = \mathcal{M} - h\Omega \qquad \text{and} \qquad \mathcal{K}^{\mathbb{Q}} = \mathcal{K} - H\Omega.$$

Denote with $\mathcal{Y}(y_t;\tau,u) = \mathbb{E}_t[e^{uy_{t+\tau}}] = e^{m_0(\tau,u)+m_y(\tau,u)y_t}$. The coefficients are given by:

$$m_0(\tau,u) = (1-e^{-2\lambda_y\tau})\sigma_y^2/(4\lambda_y),$$
$$m_y(\tau,u) = e^{-\lambda_y\tau}y_t u.$$

The price of the firm/portfolio i is given by

$$P_t^i = \int_0^{T_i} e^{a_0(\tau)+a(\tau)\top Y_t}\, g(T_i-\tau)\,\mathcal{Y}(y_t;\tau,\eta_i)d\tau$$

where $a_0(0) = \log\bar{\delta}$ and $a(0) = (1, 0, -(1+\phi)-\rho_i)^\top$.
Return variance and premium on equity, dividend strips, and firms/portfolios simply obtain by an application of Itô's Lemma.

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Online Appendix of

"Labor Rigidity and the Dynamics of the Value Premium"

Roberto Marfè

Table OA.A: Labor-Share: De-Trending and Stationarity

The left panel of the table reports the coefficient estimates, the Newey-West corrected t-statistics, and the R^2 of the regression

$$W/V_t = b_0 + b_1 t + W/V_t^{\star},$$

where the dependent variable is the time t labor-share (W/V_t) and the independent variable is the time index t. Data are yearly on the sample 1946-2013 and sub-samples. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels. The right panel of the table reports the augmented Dickey-Fuller unit root test statistic of the residuals ($W/V_t^{\star}$) from the above regression, the 5% critical value, and the p-values. The test is conducted with zero drift and two lags.

De-trending			**Augmented Dickey-Fuller Test**		
Sample	$b_1 \times 1000$	t-stat	Statistic	5% crit. val.	p-value
1946-2012	0.44	1.56	-2.143	-1.945	0.032
1946-2011	0.51*	1.94	-2.312	-1.946	0.021
1946-2010	0.59**	2.36	-2.259	-1.946	0.024
1946-2008	0.71***	3.05	-3.357	-1.946	0.001
1946-2006	0.82***	4.06	-3.170	-1.946	0.003
1963-2012	0.13	0.27	-2.244	-1.947	0.025
1963-2011	0.25	0.56	-2.373	-1.947	0.019
1963-2010	0.38	0.86	-2.114	-1.947	0.034
1963-2008	0.59	1.32	-3.194	-1.947	0.003
1963-2006	0.79*	1.85	-2.862	-1.947	0.005

Table OA.B: Labor Rigidity and Value Premium

The table reports the estimates of the regression

$$\text{HML}_t = b_0 + b_1 \Delta W/V_t^\star + b_2' \text{ controls} + \epsilon_t$$

where the dependent variable is the high minus low return (Fama and French (1992)) at time t; the independent variables are the change of the de-trended labor-share ($\Delta W/V_t^\star$) and one among: the lagged value of the the de-trended labor-share ($W/V_{t-1}^\star$), the change and the lagged value of the bondholders' remuneration ($\Delta B/V_t$ and B/V_{t-1}), the change and the lagged value of the shareholders' remuneration ($\Delta D/V_t$ and D/V_{t-1}), the change and the lagged value of investments to assets ($\Delta I/A_t$ and I/A_{t-1}), the log changes in value added ($\Delta \log V$) and GDP ($\Delta \log Y$), the lag and its square of the three Fama and French (1992) return factors (HML, SMB, MKT), and the lag of the price-earnings and price-dividends ratios (P/E and P/D). Data are yearly on the sample 1946-2013. The Newey-West corrected t-statistics are reported in parenthesis. Economic significance denotes standardized coefficients. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Δ W/V* workers' remuneration	-2.609**	-2.498**	-3.005***	-2.982***	-3.110***	-3.070***	-3.231***	-3.353***	-2.886**	-3.467***	-2.919**	-2.811**	-3.012***	-3.245***	-2.719**	-2.887**	-2.898**
t-stat	(-2.16)	(-2.07)	(-2.68)	(-2.67)	(-2.81)	(-2.74)	(-2.67)	(-2.87)	(-2.57)	(-3.36)	(-2.64)	(-2.33)	(-2.70)	(-2.83)	(-2.25)	(-2.61)	(-2.63)
lag W/V*	1.024**																
t-stat	(2.00)																
Δ B/V bondholders' remuneration		-3.513															
t-stat		(-0.74)															
lag B/V			0.258														
t-stat			(0.36)														
Δ D/V shareholders' remuneration				0.932													
t-stat				(0.83)													
lag D/V					-1.888**												
t-stat					(-2.21)												
Δ I/A investment to assets						-4.436											
t-stat						(-1.33)											
lag I/A							1.280										
t-stat							(0.62)										
Δ log V value added								-0.236									
t-stat								(-0.77)									
Δ log Y real GDP									0.369								
t-stat									(0.53)								
lag HML value minus growth excess return										-0.152							
t-stat										(-1.47)							
lag HML^2											0.706						
t-stat											(1.19)						
lag SMB small minus big excess return												0.131					
t-stat												(0.95)					
lag SMB^2													0.063				
t-stat													(0.15)				
lag MKT market excess return														-0.118			
t-stat														(-1.40)			
lag MKT^2															0.304		
t-stat															(0.81)		
log P/E price to earnings																-0.032	
t-stat																(-0.83)	
log P/D price to dividends																	-0.027
t-stat																	(-0.82)
adj-R^2	0.08	0.06	0.05	0.06	0.08	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.05	0.08	0.06	0.06	0.06

Table OA.C: Value Premium Predictability and Labor-Share: One-Year Horizon

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\text{HML}_{t+i}) = b_0 + b_1\text{W/V}_t^\star + b_2'\,\text{controls} + \epsilon_t$$

where the dependent variable is the cumulative high minus low return (Fama and French (1992)) from time t over the horizon n of 1 year; the independent variables are the de-trended time t labor-share ($W/V_t^\star$) and one among: bondholders' remuneration (B/V_t), shareholders' remuneration (D/V_t), investments to assets (I/A_t), price-earnings and price-dividends ratios (P/E_t and P/D_t), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1946-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\text{W/V}^\star$ workers' remuneration	1.384***	0.960	1.565***	1.134**	1.141**	1.167**	0.890	1.390***	1.268**
t-stat	(2.67)	(1.65)	(2.77)	(2.06)	(2.06)	(2.32)	(1.57)	(2.90)	(2.44)
B/V bondholders' remuneration	-0.510								
t-stat	(-0.60)								
D/V shareholders' remuneration		-1.097							
t-stat		(-0.84)							
I/A investment to assets			-3.390						
t-stat			(-1.58)						
log P/E price to earnings				-0.039					
t-stat				(-0.92)					
log P/D price to dividends					-0.034				
t-stat					(-0.94)				
FL financial leverage						0.100			
t-stat						(0.35)			
CS credit spread							7.516***		
t-stat							(3.08)		
TS term spread								1.080*	
t-stat								(1.73)	
Rf short rate									-3.007
t-stat									(-0.07)
adj-R^2	0.01	0.02	0.03	0.02	0.02	0.01	0.06	0.02	0.01

Table OA.D: Value Premium Predictability and Labor-Share: Two-Years Horizon

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\mathrm{HML}_{t+i}) = b_0 + b_1 \mathrm{W/V}_t^\star + b_2' \,\mathrm{controls} + \epsilon_t$$

where the dependent variable is the cumulative high minus low return (Fama and French (1992)) from time t over the horizon n of 2 years; the independent variables are the de-trended time t labor-share ($W/V_t^\star$) and one among: bondholders' remuneration (B/V_t), shareholders' remuneration ($\mathrm{D/V}_t$), investments to assets ($\mathrm{I/A}_t$), price-earnings and price-dividends ratios ($\mathrm{P/E}_t$ and $\mathrm{P/D}_t$), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1946-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\mathrm{W/V}^\star$ workers' remuneration	1.569***	1.487***	1.686***	1.371***	1.380***	1.474***	1.158**	1.462***	1.451***
t-stat	(2.96)	(3.12)	(2.89)	(2.76)	(2.75)	(3.02)	(2.63)	(3.10)	(2.98)
B/V bondholders' remuneration	-0.381								
t-stat	(-0.51)								
D/V shareholders' remuneration		0.060							
t-stat		(0.06)							
I/A investment to assets			-2.454						
t-stat			(-1.09)						
log P/E price to earnings				-0.026					
t-stat				(-0.77)					
log P/D price to dividends					-0.022				
t-stat					(-0.78)				
FL financial leverage						-0.003			
t-stat						(-0.01)			
CS credit spread							5.606**		
t-stat							(2.64)		
TS term spread								-0.082	
t-stat								(-0.16)	
Rf short rate									8.984
t-stat									(0.29)
adj-R^2	0.07	0.07	0.09	0.08	0.08	0.07	0.13	0.07	0.07

Table OA.E: Value Premium Predictability and Labor-Share: Three-Years Horizon

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\mathrm{HML}_{t+i}) = b_0 + b_1\mathrm{W/V}^{\star}_t + b_2'\,\mathrm{controls} + \epsilon_t$$

where the dependent variable is the cumulative high minus low return (Fama and French (1992)) from time t over the horizon n of 3 years; the independent variables are the de-trended time t labor-share ($W/V_t^{\star}$) and one among: bondholders' remuneration (B/V_t), shareholders' remuneration ($\mathrm{D/V}_t$), investments to assets ($\mathrm{I/A}_t$), price-earnings and price-dividends ratios ($\mathrm{P/E}_t$ and $\mathrm{P/D}_t$), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1946-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\mathrm{W/V}^{\star}$ workers' remuneration	1.670***	1.599***	1.666***	1.476***	1.481***	1.715***	1.348***	1.478***	1.536***
t-stat	(3.46)	(3.92)	(3.30)	(3.34)	(3.30)	(3.79)	(3.95)	(3.60)	(3.69)
B/V bondholders' remuneration	-0.439								
t-stat	(-0.72)								
D/V shareholders' remuneration		0.182							
t-stat		(0.20)							
I/A investment to assets			-1.459						
t-stat			(-0.73)						
log P/E price to earnings				-0.017					
t-stat				(-0.63)					
log P/D price to dividends					-0.015				
t-stat					(-0.66)				
FL financial leverage						-0.145			
t-stat						(-0.92)			
CS credit spread							3.496**		
t-stat							(2.10)		
TS term spread								-0.844**	
t-stat								(-2.46)	
Rf short rate									11.682
t-stat									(0.57)
adj-R^2	0.15	0.15	0.16	0.15	0.15	0.16	0.18	0.18	0.15

Table OA.F: Value Premium Predictability and Labor-Share: Five-Years Horizon

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\text{HML}_{t+i}) = b_0 + b_1\text{W/V}_t^{\star} + b_2'\,\text{controls} + \epsilon_t$$

where the dependent variable is the cumulative high minus low return (Fama and French (1992)) from time t over the horizon n of 5 years; the independent variables are the de-trended time t labor-share ($W/V_t^{\star}$) and one among: bondholders' remuneration (B/V_t), shareholders' remuneration (D/V_t), investments to assets (I/A_t), price-earnings and price-dividends ratios (P/E_t and P/D_t), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1946-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\text{W/V}^{\star}$ workers' remuneration	1.383***	1.147***	1.216***	1.185***	1.185***	1.505***	1.120***	1.181***	1.212***
t-stat	(3.61)	(3.58)	(3.59)	(3.38)	(3.31)	(3.87)	(3.84)	(4.32)	(3.65)
B/V bondholders' remuneration	-0.556								
t-stat	(-1.35)								
D/V shareholders' remuneration		-0.236							
t-stat		(-0.40)							
I/A investment to assets			-0.078						
t-stat			(-0.06)						
log P/E price to earnings				-0.004					
t-stat				(-0.23)					
log P/D price to dividends					-0.004				
t-stat					(-0.26)				
FL financial leverage						-0.226**			
t-stat						(-2.41)			
CS credit spread							1.172		
t-stat							(0.63)		
TS term spread								-1.218***	
t-stat								(-4.21)	
Rf short rate									0.397
t-stat									(0.03)
adj-R^2	0.19	0.17	0.17	0.17	0.17	0.24	0.17	0.30	0.17

Table OA.G: Value Premium Predictability and Labor-Share: Seven-Years Horizon

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\mathrm{HML}_{t+i}) = b_0 + b_1 \mathrm{W/V}_t^{\star} + b_2' \,\mathrm{controls} + \epsilon_t$$

where the dependent variable is the cumulative high minus low return (Fama and French (1992)) from time t over the horizon n of 7 years; the independent variables are the de-trended time t labor-share ($W/V_t^{\star}$) and one among: bondholders' remuneration (B/V_t), shareholders' remuneration ($\mathrm{D/V}_t$), investments to assets ($\mathrm{I/A}_t$), price-earnings and price-dividends ratios ($\mathrm{P/E}_t$ and $\mathrm{P/D}_t$), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1946-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\mathrm{W/V}^{\star}$ workers' remuneration	0.963***	0.569**	0.731***	0.691**	0.680**	0.941***	0.626**	0.678***	0.753***
t-stat	(3.91)	(2.11)	(3.02)	(2.50)	(2.54)	(3.10)	(2.20)	(3.14)	(2.90)
B/V bondholders' remuneration	-0.658**								
t-stat	(-2.38)								
D/V shareholders' remuneration		-0.899*							
t-stat		(-1.69)							
I/A investment to assets			0.995						
t-stat			(1.22)						
log P/E price to earnings				-0.009					
t-stat				(-0.56)					
log P/D price to dividends					-0.010				
t-stat					(-0.81)				
FL financial leverage						-0.136			
t-stat						(-1.62)			
CS credit spread							1.314		
t-stat							(0.98)		
TS term spread								-1.073**	
t-stat								(-2.38)	
Rf short rate									2.138
t-stat									(0.27)
adj-R^2	0.17	0.15	0.12	0.11	0.11	0.15	0.11	0.30	0.10

Table OA.H: Value Premium Predictability and Labor-Share: Sub-Samples

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n} \log(1 + \text{HML}_{t+i}) = b_0 + b_1 \text{W/V}_t^{\star} + b_2' \,\text{controls} + \epsilon_t$$

where the dependent variable is the cumulative high minus low return (Fama and French (1992)) from time t over the horizon of 1, 2, 3, 5, 7 years; the independent variable is the de-trended time t labor-share ($W/V_t^{\star}$). Data are yearly on the sample 1946-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

Panel A: 1946–1979	Horizon				
	1	2	3	5	7
$\text{W/V}^{\star}$ workers' remuneration	0.524	1.078	1.103**	0.863***	0.751**
t-stat	(0.47)	(1.63)	(2.27)	(4.10)	(2.56)
adj-R^2	-0.03	0.03	0.07	0.14	0.20

Panel B: 1979–2013	Horizon				
	1	2	3	5	7
$\text{W/V}^{\star}$ workers' remuneration	2.141**	2.385***	2.430***	1.760***	0.924**
t-stat	(2.51)	(3.34)	(3.93)	(3.59)	(2.58)
adj-R^2	0.03	0.10	0.20	0.19	0.08

Table OA.I: Duration Premium Predictability and Labor-Share: One-Year Horizon

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\mathrm{DP}_{t+i}) = b_0 + b_1\mathrm{W/V}^{\star}_t + b_2'\,\mathrm{controls} + \epsilon_t$$

where the dependent variable is the cumulative low duration minus high duration return (DP, Weber (2016)) from time t over the horizon n of 1 year; the independent variables are the de-trended time t labor-share ($W/V_t^\star$) and one among: bondholders' remuneration (B/V_t), shareholders' remuneration ($\mathrm{D/V}_t$), investments to assets ($\mathrm{I/A}_t$), price-earnings and price-dividends ratios ($\mathrm{P/E}_t$ and $\mathrm{P/D}_t$), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1963-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\mathrm{W/V}^\star$ workers' remuneration	2.781**	2.400*	2.536**	2.453**	2.512**	3.543***	2.007	2.480**	2.173*
t-stat	(2.25)	(1.94)	(2.32)	(2.14)	(2.27)	(2.84)	(1.63)	(2.36)	(1.96)
B/V bondholders' remuneration	-1.799								
t-stat	(-0.45)								
D/V shareholders' remuneration		-0.097							
t-stat		(-0.05)							
I/A investment to assets			-2.732						
t-stat			(-0.99)						
log P/E price to earnings				0.009					
t-stat				(0.11)					
log P/D price to dividends					0.024				
t-stat					(0.35)				
FL financial leverage						-0.911*			
t-stat						(-1.82)			
CS credit spread							0.087		
t-stat							(1.27)		
TS term spread								0.009	
t-stat								(0.76)	
Rf short rate									0.837
t-stat									(0.82)
adj-R^2	0.03	0.02	0.03	0.02	0.02	0.08	0.05	0.03	0.03

Table OA.J: Duration Premium Predictability and Labor-Share: Two-Years Horizon

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\mathrm{DP}_{t+i}) = b_0 + b_1\mathrm{W/V}_t^{\star} + b_2'\,\mathrm{controls} + \epsilon_t$$

where the dependent variable is the cumulative low duration minus high duration return (DP, Weber (2016)) from time t over the horizon n of 2 years; the independent variables are the de-trended time t labor-share ($W/V_t^{\star}$) and one among: bondholders' remuneration (B/V_t), shareholders' remuneration ($\mathrm{D/V}_t$), investments to assets ($\mathrm{I/A}_t$), price-earnings and price-dividends ratios ($\mathrm{P/E}_t$ and $\mathrm{P/D}_t$), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1963-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\mathrm{W/V}^{\star}$ workers' remuneration	3.318***	3.042***	2.942***	2.908***	2.969***	3.899***	2.324**	2.884***	2.722***
t-stat	(3.05)	(3.37)	(3.15)	(3.16)	(3.32)	(4.04)	(2.46)	(3.34)	(3.23)
B/V bondholders' remuneration	-2.030								
t-stat	(-0.56)								
D/V shareholders' remuneration		0.809							
t-stat		(0.58)							
I/A investment to assets			-1.477						
t-stat			(-0.58)						
log P/E price to earnings				0.007					
t-stat				(0.11)					
log P/D price to dividends					0.020				
t-stat					(0.35)				
FL financial leverage						-0.759**			
t-stat						(-2.22)			
CS credit spread							0.099*		
t-stat							(1.94)		
TS term spread								0.001	
t-stat								(0.12)	
Rf short rate									0.580
t-stat									(0.68)
adj-R^2	0.14	0.13	0.13	0.13	0.13	0.22	0.20	0.13	0.14

Table OA.K: Duration Premium Predictability and Labor-Share: Three-Years Horizon

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\mathrm{DP}_{t+i}) = b_0 + b_1\mathrm{W/V}_t^{\star} + b_2'\,\mathrm{controls} + \epsilon_t$$

where the dependent variable is the cumulative low duration minus high duration return (DP, Weber (2016)) from time t over the horizon n of 3 years; the independent variables are the de-trended time t labor-share ($W/V_t^{\star}$) and one among: bondholders' remuneration (B/V_t), shareholders' remuneration ($\mathrm{D/V}_t$), investments to assets ($\mathrm{I/A}_t$), price-earnings and price-dividends ratios ($\mathrm{P/E}_t$ and $\mathrm{P/D}_t$), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1963-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
W/V* workers' remuneration	3.405***	3.183***	2.952***	3.028***	3.102***	3.967***	2.545***	2.927***	2.839***
t-stat	(3.45)	(4.19)	(3.78)	(3.94)	(4.11)	(4.65)	(3.67)	(4.05)	(3.88)
B/V bondholders' remuneration	-1.818								
t-stat	(-0.60)								
D/V shareholders' remuneration		0.997							
t-stat		(0.83)							
I/A investment to assets			0.380						
t-stat			(0.16)						
log P/E price to earnings				0.011					
t-stat				(0.19)					
log P/D price to dividends					0.024				
t-stat					(0.50)				
FL financial leverage						-0.669**			
t-stat						(-2.37)			
CS credit spread							0.071*		
t-stat							(1.86)		
TS term spread								-0.008	
t-stat								(-0.91)	
Rf short rate									0.660
t-stat									(1.14)
adj-R^2	0.22	0.22	0.21	0.21	0.22	0.31	0.27	0.22	0.23

Table OA.L: Duration Premium Predictability and Labor-Share: Five-Years Horizon

The table reports the estimates of the regression

$$\frac{1}{n}\sum_{i=1}^{n}\log(1+\mathrm{DP}_{t+i}) = b_0 + b_1\mathrm{W/V}_t^\star + b_2'\,\text{controls} + \epsilon_t$$

where the dependent variable is the cumulative low duration minus high duration return (DP, Weber (2016)) from time t over the horizon n of 5 years; the independent variables are the de-trended time t labor-share ($W/V_t^\star$) and one among: bondholders' remuneration (B/V_t), shareholders' remuneration ($\mathrm{D/V}_t$), investments to assets ($\mathrm{I/A}_t$), price-earnings and price-dividends ratios ($\mathrm{P/E}_t$ and $\mathrm{P/D}_t$), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1963-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
W/V⋆ workers' remuneration	3.369***	2.832***	2.432***	2.662***	2.728***	3.555***	2.403***	2.514***	2.484***
t-stat	(4.07)	(4.68)	(3.24)	(4.72)	(4.81)	(6.31)	(4.29)	(3.98)	(3.70)
B/V bondholders' remuneration	-2.935								
t-stat	(-1.65)								
D/V shareholders' remuneration		1.237							
t-stat		(1.28)							
I/A investment to assets			3.533						
t-stat			(1.48)						
log P/E price to earnings				0.019					
t-stat				(0.43)					
log P/D price to dividends					0.027				
t-stat					(0.71)				
FL financial leverage						-0.603***			
t-stat						(-3.01)			
CS credit spread							0.013		
t-stat							(0.31)		
TS term spread								-0.009	
t-stat								(-1.30)	
Rf short rate									0.345
t-stat									(0.80)
adj-R^2	0.32	0.28	0.31	0.26	0.27	0.42	0.26	0.29	0.27

Table OA.M: Duration Premium Predictability and Labor-Share: Seven-Years Horizon

The table reports the estimates of the regression

$$\frac{1}{n}\sum\nolimits_{i=1}^{n}\log(1+\mathrm{DP}_{t+i}) = b_0 + b_1 \mathrm{W/V}^{\star}_t + b_2' \,\mathrm{controls} + \epsilon_t$$

where the dependent variable is the cumulative low duration minus high duration return (DP, Weber (2016)) from time t over the horizon n of 7 years; the independent variables are the de-trended time t labor-share ($W/V_t^{\star}$) and one among: bondholders' remuneration (B/V_t), shareholders' remuneration ($\mathrm{D/V}_t$), investments to assets ($\mathrm{I/A}_t$), price-earnings and price-dividends ratios ($\mathrm{P/E}_t$ and $\mathrm{P/D}_t$), financial leverage (FL_t), credit spread (CS_t), term-spread (TS_t), and short rate (Rf_t) in Panel B. Data are yearly on the sample 1963-2013. The Newey-West corrected t-statistics are reported in parenthesis. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\mathrm{W/V}^{\star}$ workers' remuneration	2.554***	2.047***	1.770**	1.905***	1.934***	2.369***	1.632***	1.734***	1.787***
t-stat	(3.19)	(3.32)	(2.52)	(3.39)	(3.36)	(3.77)	(2.98)	(2.92)	(2.78)
B/V bondholders' remuneration	-2.297								
t-stat	(-1.54)								
D/V shareholders' remuneration		1.171							
t-stat		(0.91)							
I/A investment to assets			3.240						
t-stat			(1.59)						
log P/E price to earnings				0.012					
t-stat				(0.30)					
log P/D price to dividends					0.015				
t-stat					(0.44)				
FL financial leverage						-0.306			
t-stat						(-1.40)			
CS credit spread							0.015		
t-stat							(0.44)		
TS term spread								-0.009	
t-stat								(-1.25)	
Rf short rate									0.121
t-stat									(0.28)
adj-R^2	0.24	0.20	0.24	0.18	0.19	0.25	0.18	0.22	0.18