Wage-led or Profit-led Economic Growth:
The case of Chile 1996-2017

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Outline

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Motivation

- What is the role of wages in a capitalist economy?
  - Two-sided role (Bhaduri & Marglin, 1990).

- What is the effect of wage restraint/expansion on economic growth?

- Could be the high inequallity in Chile a binding constraint for economic growth?

Contributions

1. First empirical study about inequallity and growth in Chile under a post-Keynesian/post-Kaleckian approach.

In relation to the Post-Keynesian empirical literature:

2. We compute our empirical estimations with a wage bill that does not count the managerial wage bill.
3. We test for structural breaks in our series, allowing for possible switching from one regime to the other over the period analyzed.

The functional distribution of income

- The post-Keynesian approach is based on the study of the functional income distribution i.e. the income of capital and labor.

$$GDP_{fc} = GDP\ at\ factor\ cost = GDP - T + S$$

$$GDP_{fc} = Profits + Wage\ bill = P + W \cdot L$$

$$1 = \frac{P}{GDP_{fc}} + \frac{W \cdot L}{GDP_{fc}} = P_s + W_s$$

- The functional income distribution shapes and determines the aggregate demand.

$$DA = C + I + G + X_n$$

$$DA = C(Y, P_s) + I(Y, P_S) + G + X_n(Y, P_s)$$

The functional distribution of income

$$Y^* = DA = C(Y, P_s) + I(Y, P_s) + G + X_n(Y, P_s)$$

$$\frac{\partial Y^*}{\partial P_s} = \frac{1}{\left[1 - \frac{\partial C}{\partial Y} - \frac{\partial I}{\partial Y} - \frac{\partial X_n}{\partial Y}\right]} \cdot \left[\frac{\partial C}{\partial P_s} + \frac{\partial I}{\partial P_s} + \frac{\partial X_n}{\partial P_s}\right] = \frac{1}{1 - h_2} \cdot h_1$$

- The term $1/1 - h_2$ corresponds to the multiplier and has to be positive for stability.
- **The sign of the total derivative will therefore depend on the sign of the numerator (h_1)**
- This sum is the private excess demand i.e. the change in demand caused by a change in income distribution given a certain level of income.
- The sum of these effects can therefore be determined empirically.

The functional distribution of income

The effect of a redistribution of income on demand is ambiguous (Dutt, 1984; Blecker 1989).

- Aggregate consumption will depend negatively on the profit share.
- Investment will depend positively on the profit share.
- Net exports will depend negatively on wage share (or positively on the profit share).

$$\underset{(-)}{\frac{\partial C}{\partial P_S}} + \underset{(+)}{\frac{\partial I}{\partial P_s}} + \underset{(+)}{\frac{\partial X_n}{\partial P_s}} > 0 \quad \Rightarrow \quad \frac{\partial Y^*}{\partial P_S} > 0 \quad \Rightarrow$$ Profit-led regime

$$\frac{\partial C}{\partial P_S} + \frac{\partial I}{\partial P_s} + \frac{\partial X_n}{\partial P_s} < 0 \quad \Rightarrow \quad \frac{\partial Y^*}{\partial P_S} < 0 \quad \Rightarrow$$ Wage-led regime

Chilean wage share

- We estimate a wage bill that discounts the wage bill of the managerial workers through:

$$W \cdot L = Average\ Nominal\ Wage\ \cdot Total\ Employment$$

$$W_m \cdot L_m = Average\ Nominal\ Wage\ of\ Managers\ \cdot Employment\ of\ Managers$$

$$A(W \cdot L) = W \cdot L - W_m \cdot L_m$$

$$GDP_{fc} = P + A(W \cdot L)$$

$$\text{Ps} = 1 - W_s$$

- Where GDP_{fc} is the nominal GDP at factor cost and P is nominal profits.
- The average wage share is near 39%, while the average adjusted wage share was 32% in this period.

Empirical strategy

- **Single equation approach** which is widely used in empirical literature (Onaran & Galanis, 2012; Stockhammer, Hein & Grafl, 2011; Hein & Vogel, 2007).
- It implies that we estimate the effect of an increase in 1%-point in the profit share in each element on aggregate demand (C, I and Xn) and adding them up.
- It has some disadvantages as:
  - High sensibility to the model specification.
  - We assume that the functional distribution of income is exogenous which can lead us to simultaneity bias (Blecker, 2015).
- If there is cointegration among the variables we use the Error Correction Model methodology (ECM) if not, then we estimate a model in differences.
- We use deflacted data by GDP deflactor and in logarithm provided by the Central Bank of Chile and the National Institute of Statistics.

Consumption

- We define aggregate consumption as function of the income of each factor of production.

$$C_t = f(W_t, P_t)$$

- Where C_t is real consumption, P_t is real profits and W_t is real wage bill.

- As we can confirm cointegration among the variables we run the following ECM:

$$\Delta C_t = \beta_0 + \beta_1 C_{t-1} + \beta_2 W_{t-1} + \beta_3 P_{t-1} + \sum_{i=1}^{n} \alpha_{i-1} \Delta C_{t-i} + \sum_{i=1}^{n} \delta_i \Delta W_{t+1-i} + \sum_{i=1}^{n} \gamma_i \Delta P_{t+1-i} + u_t$$

$$EC = \beta_1 \left(C_{t-1} - \frac{-\beta_2}{\beta_1} W_{t-1} - \frac{-\beta_3}{\beta_1} P_{t-1}\right)$$

→ Long-run relationship among the variables (or the Error Correction part of the ECM)

Marginal effects

	Marginal propensities to consume		Mean values		Marginal effect		Net effect of an increase in 1% of Profit share on C/Y (E)-(F)
	Out of Wages (A)	Out of Profits (B)	$\frac{C}{W}$ (C)	$\frac{C}{P}$ (D)	Out of wages (E=A*C)	Out of Profits (F=B*D)	
Aggregate Consumption	0.7	0.33	2.177	1.009	1.524	0.333	**-1.191**

- We transorm the marginal propensities to consume in marginal effects through the ponderation of the mean value of the sample, in order to estimate the impact on consumption of an increase in 1%-point in the profit share:

$$\frac{\partial C}{\partial P} = \frac{\partial\, C/Y}{\partial\, P/Y} = \frac{-\beta_3}{\beta_1} \cdot \frac{C}{P} - \frac{-\beta_2}{\beta_1} \frac{C}{W} = 0.33 \cdot \frac{C}{P} - 0.7 \cdot \frac{C}{W}$$

- Therefore, an increase in the profit share of 1%-point will decrease aggregate consumption (as a ratio of GDP) by 1.2%-point.

Investment

- We define investment as a function of the GDP, the profit share and the monetary policy rate.

$$I = f(Y, P_s, r)$$

- Where I_t is real investment, Y_t is real GDP, P_{s_t} is the profit share, and r_t is the monetary policy rate.

- As we can not confirm the existence of cointegration among the variables, we estimate a model in differences:

$$\Delta I_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i \Delta Y_{t+1-i} + \sum_{i=1}^{n} \boldsymbol{\beta_i} \Delta P_{s_{t+1-i}} + \sum_{i=1}^{n} \gamma_i \Delta r_{t+1-i} + \sum_{i=1}^{n} \delta_i \Delta I_{t-i} + u_t \quad \Rightarrow \quad \mathrm{e_{ps}} = \frac{\sum_{i=1}^{n} \beta_i}{1 - \sum_{i=1}^{n} \delta_i}$$

Domestic demand effect

	Elasticity	Ratio	Net effect of an increase in 1% of Profit share on I/Y	Net effect of an increase in 1% of Profit share on Consumption	Net effect of an increase in 1% of Profit share on domestic demand
	e_{ps} (A)	$\frac{I}{P}$ (B)	(A*B)		
Investment	1.07	0.376	0.402	-1.191	**-0.789**

- We obtain that a 1%-point increase in the profit share decreases internal demand by 0.8%-points.
- Hence, the Chilean domestic demand is in a wage-led regime, due to:
  - High difference between marginal propensities to consume.
  - Relatively low investment in relation to profits.
- This finding is also common in the empirical literature (Onaran & Galanis, 2012).

Imports and intern prices

Higher wages → Higher Costs → Higher Intern Prices → Affect relative prices → Increase imports

- We define intern prices as function of the nominal unit labor cost (ULC), import prices (P_m) and the copper price (P_c).
- The nominal unit labor cost is prices times the real unit labor cost which is the wage bill as ratio of GDP.

$$p = f(ULC, P_m, P_c) \qquad ULC = p \cdot RULC = p \cdot w_s \cdot \frac{Y_{fc}}{Y}$$

- As we can not confirm the existence of cointegration among the variables, we estimate a model in differences:

$$\Delta \mathrm{p}_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i \Delta(\mathrm{P_m})_{t+1-i} + \sum_{i=1}^{n} \boldsymbol{\beta}_i \Delta(ULC)_{t+1-i} \sum_{i=1}^{n} \gamma_i \Delta(\mathrm{P_c})_{t+1-i} + \sum_{i=1}^{n} \delta_i \Delta \mathrm{p}_{t-i} + u_t$$

Imports and intern prices

- We define the imports as a function of the real exchange rate and the ratio between domestic and import prices.

$$M = f(\frac{p}{P_m}, \epsilon)$$

- Where M_t is real imports, $\frac{p}{P_m}$ is the ratio between intern an import prices and ϵ_t is the real exchange rate.

- As we can confirm the existence of cointegration among the variables we run the next ECM:

$$\Delta M_t = \beta_0 + \beta_1 M_{t-1} + \beta_2 \frac{p}{P_{m_{t-1}}} + \beta_3\ \epsilon_{t-1} + \sum_{i=1}^{n} \alpha_{\mathrm{i}-1} \Delta M_{t-i+1} + \sum_{i=1}^{n} \delta_{\mathrm{i}} \Delta \frac{p}{P_{m_{t-i}}} + \sum_{i=1}^{n} \gamma_{\mathrm{i}} \Delta\ \epsilon_{t-1} + u_t$$

Marginal effects

- Once we have estimated the elasticities we can compute the marginal effect of an increase in the wage share on imports:

$$\frac{\partial M/Y}{\partial W_S} = \left[\frac{\partial M}{\partial P} \cdot \frac{\partial P}{\partial ULC} \cdot \frac{\partial ULC}{\partial RULC} \cdot \frac{\partial RULC}{\partial W_S}\right] \cdot \frac{M/Y}{RULC} = \left[e_{m/p} \cdot e_{p/ulc} \cdot \frac{1}{1 - e_{p/ulc}} \cdot \frac{Y_f}{Y}\right] \cdot \frac{M/Y}{RULC}$$

- As the RULC is the wage share times the ratio between GDP at factor cost and GDP, we can compute the marginal effect through the chain rule.

$e_{m/p}$	$e_{\mathrm{p}/ULC}$	$e_{\mathrm{ULC}/RULC}$	$e_{m/RULC}$	$\frac{Y_f}{Y}$	$\frac{M}{Y}$	RULC	$\frac{\partial M/Y}{\partial Ws}$	$\boldsymbol{\frac{\partial \mathbf{M}/Y}{\partial \mathbf{Ps}}}$
A	B	C	D=(A*B*C)	E	F	G	D*E*F/G	**-D*E*F/G**
1.24	0.11	1.12	0.15	0.913	0.31	0.29	0.148	**-0.148**

- Therefore, an increase in the profit share of 1%-point will decrease imports (as percentage of GDP) by 0.15%-point.

Exports

- We define exports as a function of the real exchange rate, the real unit labor cost (which indicates the level of competitiviness) and GDP from the main trading partners of Chile.

$$X = f(Y^*, \mathrm{RULC}, \epsilon)$$

- Where X_t are the exports, ${Y^*}_t$ is the GDP from the main trading partners of Chile (China, USA, UE, Japan), $\mathrm{R}ULC_t$ is the real unit labor cost and ϵ_t is the exchange rate.

- As we can not confirm the existence of cointegration among the variables, we estimate a model in differences:

$$\Delta X_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i \Delta(Y^*)_{t-i} + \sum_{i=1}^{n} \beta_i \Delta(\mathrm{R}ULC)_{t-i} + \sum_{i=1}^{n} \gamma_i \Delta\epsilon_{t-i} + \sum_{i=1}^{n} \delta_i \Delta \mathrm{X}_{t-i} + u_t$$

Marginal effects

- We can compute the effect of higher wage share through the chain rule.

$$\frac{\partial X/Y}{\partial W_s} = \left[\frac{\partial X}{\partial RULC} \cdot \frac{\partial RULC}{\partial W_S}\right] \cdot \frac{X/Y}{RULC} = \left[e_{RULC/X} \cdot \frac{Y_f}{Y}\right] \cdot \frac{X/Y}{RULC}$$

- We multiply the elasticities by the mean values of the sample to obtain the marginal effect and obtain the total effect on net exports.

$e_{\mathrm{x}/RULC}$	$\frac{Y_f}{Y}$	$\frac{X}{Y}$	RULC	$\frac{\partial X/Y}{\partial Ws}$	$\frac{\partial X/Y}{\partial \mathrm{P}s}$	$\frac{\partial M/Y}{\partial Ps}$	$\frac{\partial X_n/Y}{\partial Ps}$
A	B	C	D	E=(A*B*C/D)	F (-E)	G	F-G
-0.19	0.91	0.34	0.29	-0.204	0.204	-0.148	0.352

- Therefore, an increase in the profit share of 1%-point will increase exports (as percentage of GDP) in 0.2%-point and an increase in the profit share of 1%-point will increase net exports by 0.35%-point.

Total effect

- Once we have estimated each effect of aggregate demand, we can add this in order to obtain the total effect of a redistribution of income.

$\frac{\partial C/Y}{\partial Ps}$	$\frac{\partial I/Y}{\partial Ps}$	$\frac{\frac{\partial C}{Y}+\frac{\partial I}{Y}}{\partial Ps}$	$\frac{\partial X_n/Y}{\partial Ps}$	Private excess demand ($\boldsymbol{h_1}$)
A	B	A+B	C	D (A+B+C)
-1.19	0.40	-0.79	0.35	-0.44

- Thus a 1%-point increase in the profit share leads to a 0.44%-point decrease in the total aggregate demand in the mean values.

- Therefore, we can conclude that Chile in the last twenty years has been in a wage-led regime because an increase in the profit share leads to a decrease of the aggregate demand.

The multiplier

- We compute the multiplier ($\frac{1}{1-h_2}$) through:

$$\frac{\partial C}{\partial Y} + \frac{\partial I}{\partial Y} - \frac{\partial M}{\partial Y} = e_{cy}\frac{C}{Y} + e_{iy}\frac{I}{Y} - e_{my}\frac{M}{Y} = h_2$$

$e_{C/Y}$	$e_{I/Y}$	$e_{M/Y}$	C/Y	I/Y	M/Y	h_2	**Multiplier**	h_1	Total Effect
0.45	1.82	1.82	0.61	0.23	0.31	0.129	**1.15**	**-0.44**	**-0.5**

- The multiplier effect is relatively low (Onaran & Galanis, 2012) due to the high income elasticity of imports and its participation in the GDP.

- Nevertheless, the total effect of a 1%-point increase in the profit share provokes an aggregate demand contraction of 0.5%-point, taking into account the multiplier effect.

Structural breaks

- We proceed to check if there was a change in a parameter that could lead to weak or shift the wage-led economic regime in Chile.

- We apply the Bai-Perron test for structural break test to the best specification for each component of aggregate demand.

- We proceed to verify the break date with the Chow-test.

- If the Chow test confirms the existence of a structural break in the data we proceed to re estimate the equation in sub-periods with several specifications and select the best one.

- We evaluate the elasticities in the sub-sample means and proceed to estimate the marginal effect of an increase in 1%-point in the profit share for each sub-sample

Structural breaks: Consumption

	Methodology	Marginal propensities to consume		Sample means		Marginal effect		Net effect
		Out of wages	Out of Profits	C/W	C/P	Out of wages	Out of profits	
1996Q1-2009Q1	ECM	0.64	0.36	2.19	1.02	1.40	0.37	-1.03
2009Q3-2017Q4	Differences	0.89	0.48	2.22	0.96	1.97	0.46	-1.51

- Break date: 2009Q2.
- Both marginal propensities to consume increase after the break date, but the difference between them becomes higher.
- The evolution of the mean values of the sample suggests that a redistribution of income towards profits earners would decrease, even more, consumption.

Structural breaks: Investment

	Methodology	Elasticity	Sample means	Net effect
		Out of Profits	I/P	
1996Q1-2000Q1	Differences	**1.94**	**0.44**	**0.86**
2000Q3-2017Q4	Differences	**1.08**	**0.37**	**0.40**

- Break date: 2000Q2.
- The sensitivy to profitability decreases considerably after the break.
- Also, the evolution of the mean values of the sample suggests that the impact of the profit share on investment diminishes.

Structural breaks: Imports

	Methodology	Elasticity			Sample means			$\frac{\partial M/Y}{\partial Ws}$	$\frac{\partial \mathbf{M}/Y}{\partial \mathbf{Ps}}$
		$e_{m/p}$	$e_{p/ulc}$	$e_{ulc/rulc}$	M/Y	RULC	Yfc/Y		
1996Q1-2008Q1	ECM	1.09	0.11	1.12	0.3	0.3	0.91	0.12	-0.12
2008Q3-2012Q3	Differences	1.06	0.11	1.12	0.37	0.27	0.92	0.16	-0.16
2013Q1-2017Q4	Differences	1.09	0.11	1.12	0.3	0.28	0.91	0.13	-0.13

- We can not confirm any structural break in the intern prices function.
- Break date in import function: 2008Q2 and 2012Q4.
- We observe a stable elasticity through time.

Structural breaks: Exports

	Methodology	Elasticity	Sample means			$\frac{\partial X/Y}{\partial Ws}$	$\frac{\partial \boldsymbol{X/Y}}{\partial \mathbf{Ps}}$
		e_{RULC}	X/Y	RULC	Yfc/Y		
1996Q1-2004Q1	Differences	-0.27	0.3	0.32	0.91	-0.23	0.23
2004Q3-2017Q4	Differences	-0.13	0.37	0.27	0.92	-0.17	0.17

- Break date: 2004Q2.
- After the commodity boom the elasticity is reduced by almost a half.
- The mean values suggest that the effect of a redistribution on exports is minor in the second sub-sample.

Structural breaks

- Once we have estimated each effect of aggregate demand in sub-periods, we can add this in order to obtain the total effect of a redistribution of income for each sub-period.

	$\frac{\partial C/Y}{\partial P/Y}$	$\frac{\partial I/Y}{\partial P/Y}$	Private excess domestic demand	$\frac{\partial X/Y}{\partial P/Y}$	$\frac{\partial M/Y}{\partial P/Y}$	$\frac{\partial X_n/Y}{\partial P/Y}$	Private excess demand
	A	B	C(A+B)	D	E	F(D+E)	C+F
1996Q1-2000Q1	-0.89	0.86	-0.04	-0.21	0.11	0.31	0.28
2000Q3-2004Q1	-0.9	0.4	-0.5	-0.26	0.12	0.37	-0.12
2004Q3-2008Q1	-1.14	0.36	-0.78	-0.2	0.15	0.35	-0.43
2008Q3-2009Q1	-1.16	0.45	-0.72	-0.18	0.18	0.36	-0.36
2009Q3-2012Q3	-1.52	0.38	-1.14	-0.16	0.15	0.31	-0.83
2013Q1-2017Q4	-1.5	0.4	-1.1	-0.13	0.13	0.26	-0.85

→ Wage-led

- The domestic demand is wage-led for every sub-period.
- The aggregate demand is wage-led since 2000.
- The effect of a redistribution on economic growth is higher after the financial crisis due to the changes in the parameters and the composition of aggregate demand.

Conclusions and policy implications

- Our estimations show that a 1%point increase in the profit share would cause a contraction of internal aggregate demand of almost 0.44%-point and -0.5%-point if we take into account the multiplier effect.
- Over the last 17 years, Chile has been immersed in a wage-led regime.
- The policies that address inequality would have beneficial effects on economic performance.
- Consequently, a labor reform that reaches an increase in the bargaining power of the working class, minimum wage policies, or labor union protection which would be expressed in an increase in the wage share, should encourage aggregate demand and economic growth.
- In other words, **improving income distribution would be consistent with faster economic growth.**

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Annex #1: Profits and consumption

$$C = C_0 + C_W \cdot W + C_p \cdot P$$

$$C = C_0 + C_W \cdot (Y - P) + C_p \cdot P$$

$$C = C_0 + \left(C_p - C_w\right) \cdot P + C_w \cdot Y$$

$$\frac{C}{Y} = C_0 + C_w + \left(C_p - C_w\right) \cdot \frac{P}{Y}$$

$$\frac{\partial C/Y}{\partial P/Y} = C_p - C_W$$

$$\frac{\partial C/Y}{\partial P/Y} < 0$$

"The Kaleckian assumption is that the marginal propensity to save is higher for capital incomes than for wage income; consumption is therefore expected to increase when the wage share rises"

(Stockhammer, 2008, p.4)

Annex #2: Profits and investment

- We can define the profit rate as:

$$r = \frac{P}{K} = \frac{P}{Y} \cdot \frac{Y}{Y_f} \cdot \frac{Y_{fc}}{K} = \frac{P_s \cdot u}{v}$$

- Therefore the profit rate can be determined by the profit share and the degree of capacity utilization.
- In the work of Bhaduri and Marglin (1990) they exposed that by not disaggregating the profit rate can lead to mixing the the supply factors (the profit share) and the demand factors (the degree of capacity of utilization).

$$I = f(P_s, u)$$

$$I = i_0 + i_r \cdot P_s + i_u \cdot u$$

Annex #3: Aggregate demand and capacity utilization

- Following the post-Keynesian literature (Rowthorn, 1981), the capitalist economies react differently depending on the level of capacity utilization.

- We define the capacity of utilization as the ratio of effective GDP and GDP at full capacity:

$$u = \frac{Y}{Y_{fc}}$$

a. At full capacity (u=1), output is taken as given and it is assumed that firms respond to variations in demand by altering the prices at which they sell.

b. Below full capacity (u <1), it is assumed that prices are relatively inflexible and firms respond to changes in demand by varying the amount they produce.

Annex #3: Inflation and aggregate demand

Potential output growth and output gap (as % of potential output) (1999-2016)				
	Potential output		**Output gap**	
	ICOR	Production function	ICOR	Production function
1999-03	3,8	3,6	6,8	4,6
2004-07	4,1	4,4	2,4	2,0
2008-13	3,8	4,1	2,3	3,2
2014-16	3,6	3,2	**4,1**	**4,2**
1999-2016	3,8	3,8	3,9	3,5
Sources: Ffrench-Davis (2018). Based on Central Bank Data.				

- According to Ffrench-Davis (2018), there is an important output gap in the Chilean economy since the slowdown of 2014.

- This output gap is almost 4% of the potential GDP, which is the second biggest gap after the asian crisis.

Annex #4: Real unit labor cost and nominal unit labor cost

$$ULC = RULC \cdot P$$

$$ln(ULC) = ln(RULC) + \ln(P)$$

$$ln(RULC) = ln(ULC) - \ln(P)$$

$$\frac{\partial \ln(RULC)}{\partial \ln(ULC)} = \frac{\partial \ln(ULC)}{\partial \ln(ULC)} - \frac{\partial \ln(P)}{\partial \ln(ULC)} = 1 - e_{ULC/P}$$

$$e_{ULC/RULC} = \frac{\partial \ln(ULC)}{\partial \ln(RULC)} = \frac{1}{1 - e_{ULC/p}}$$

Annex #5: Aggregate marginal propensity to consume

$$C = C_0 + C_W \cdot W + C_p \cdot P$$

$$C = C_0 + C_W \cdot (Y - P) + C_p \cdot P$$

$$C = C_0 + \left(C_p - C_w\right) \cdot P + C_w \cdot Y$$

$$C = C_0 + \left(C_p - C_w\right) \cdot P_s \cdot Y + C_w \cdot Y$$

$$C = C_0 + \left[\left(C_p - C_w\right) \cdot P_s + C_w\right] \cdot Y$$

$$P_s = \frac{P}{Y}$$

$$P_s \cdot Y = P$$

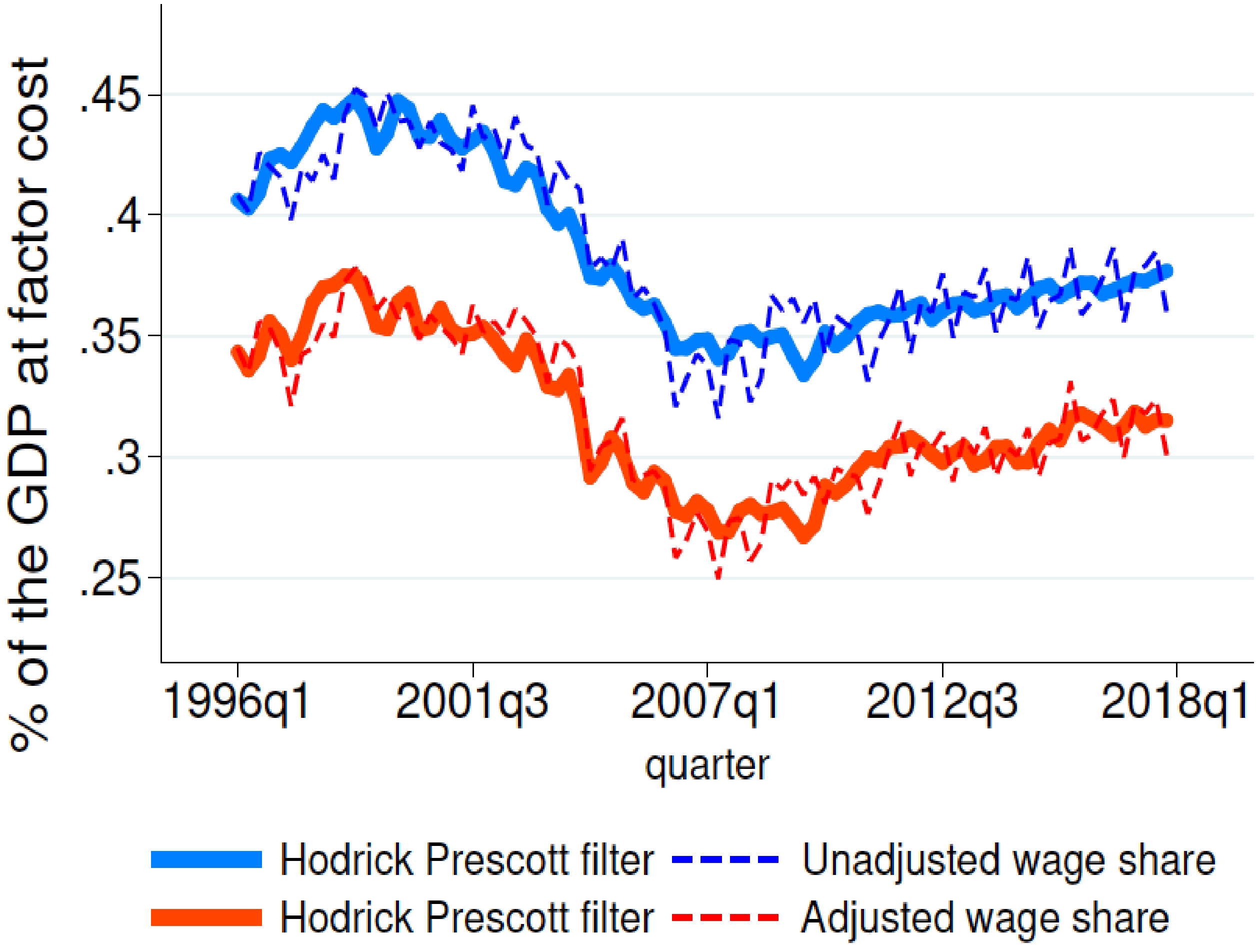
Annex #6: Average and Managerial wage bill

Average nominal wage and employment by type of worker (1996-2017)

	Nominal wage (thousands CLP)			Employment (thousands of persons)		
Period	General	Managerial	Ratio	General	Managerial	Ratio
1996-2002	231,55	1117,07	4.82	5380,80	194,17	0,04
2003-2007	306,91	1516,93	4.93	6139,30	242,88	0,04
2008-2010	393,74	2076,30	5.28	6826,77	246,24	0,04
2011-2014	480,47	2454,39	5.11	7711,06	252,27	0,03
2015-2017	587,85	3000,84	5.10	8152,09	247,98	0,03

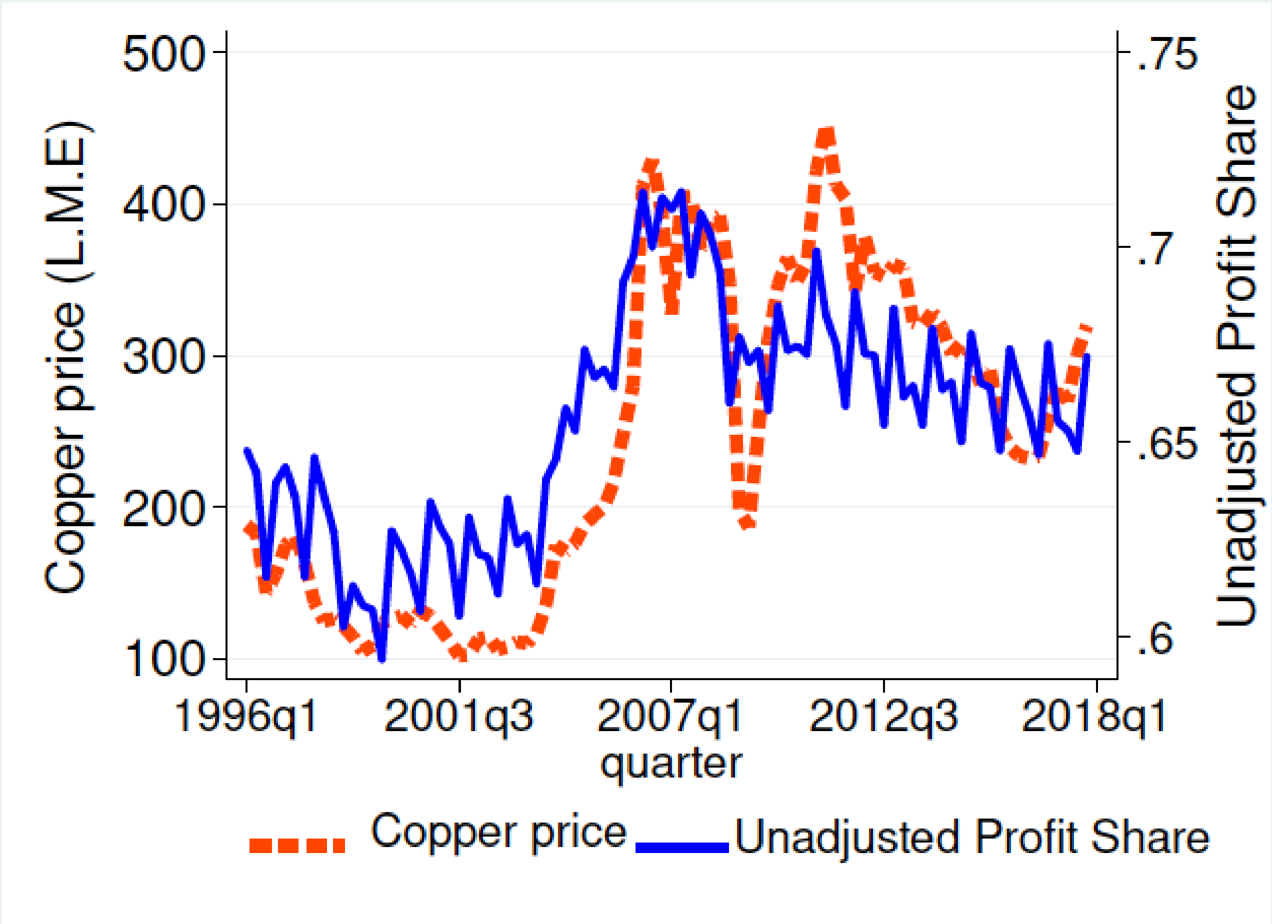
Source: Own elaboration with data from INE and the Central Bank of Chile.

Annex #7: Adjusted and unadjusted wage share



Source: Own elaboration with data from INE and the central bank of Chile.

Annex #8: Profit share and commoditie prices



- The Correlation among the copper price and the unadjusted Profit share is 0.8

Source: Own elaboration with data from COCHILCO, INE and the Central Bank of Chile.

Annex #9: Marginal effects in delevoping countries

	Period	C/Y	I/Y	Xn/Y	h_1	Multiplier	Total Effect
Chile	1996-2017	-1.2	0.4	**0.35**	-0.44	**1.15**	-0.5
Argentina	1970-2007	-0.15	0.02	0.19	0.05	1.38	0.08
Mexico	1972-2007	-0.44	0.15	**0.38**	0.1	**1.11**	0.11
Turkey	1972-2006	-0.5	0	0.28	-0.28	2.21	-0.46
Korea	1971-2007	-0.422	0	**0.36**	-0.06	1.82	-0.12
China	1980-2007	-0.412	0	1.99	1.54	1.23	1.93
South Africa	1971-2007	-0.145	0.13	0.51	0.49	1.49	0.73
India	1972-2007	-0.29	0	0.31	0.018	2.18	0.04

Source: Onaran & Galanis (2012).

Empirical Annex #1: Long-term relationship between aggregate consumption and classes incomes

Lags	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
C_{t-1}	-0.79***	-0.97***	-0.64***	-0.24	-0.44***	-0.39**	-0.36*	-0.49**
W_{t-1}	0.57***	0.66***	0.45***	0.15	0.31***	0.28**	0.25*	0.32**
P_{t-1}	0.24***	0.33***	0.21***	0.09	0.14**	0.13**	0.12*	0.18**
Marginal propensities to consume								
Out of Wages	0.72	0.68	0.70	-	0.70	0.71	0.71	0.65
Out of Profits	0.31	0.34	0.32	-	0.33	0.32	0.33	0.36
N	87	86	85	84	83	82	81	80
adj. R^2	0.798	0.831	0.847	0.891	0.932	0.934	0.931	0.935
AIC	-352.90	-360.99	-361.34	-382.85	-417.54	-412.20	-400.94	-399.10
BIC	-338.11	-338.90	-332.03	-346.39	-374.00	-361.66	-343.47	-334.79
DW	-1.82	1.75	2.12	1.41	1.89	2.02	2.03	1.93
$CUSUM$	-0.33	0.77	0.67	0.55	0.66	0.58	0.78	0.54

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Annex #2: Different specifications for the investment function

	(1)	(2)	(3)	(4)	(5)	**(6)**	(7)
ΔPs_t	-0.91*	-0.73**	-0.78**	-0.67*	-0.53	-0.43	-0.66*
ΔPs_{t-1}		0.95**	1.01**	0.99**	0.88**	0.80**	0.71*
ΔY_t	3.02***	2.00***	2.10***	1.99***	2.93***	2.78***	2.85***
ΔY_{t-1}	-1.78***	-1.72***	-1.78***	-1.48***	-1.53***	-1.55***	
Δr_t	0.02	0.07**		0.07***		0.06**	0.07***
Δr_{t-1}		0.00	0.04*				
Δpc_t	-0.07	-0.13**	-0.16***	-0.13**	-0.17***	-0.14***	
Δpc_{t-1}		0.14***	0.17***	0.14***	0.14***	0.13***	
ΔI_{t-3}					0.26***	0.25***	0.25***
Profit share elasticity of investment							
e_{ps}	-0.91	0.22	0.23	0.32	1.19	1.07	0.07
N	83	82	82	83	84	83	83
adj. R^2	0.726	0.890	0.884	0.891	0.895	0.903	0.888
AIC	-174.14	-242.50	-238.64	-248.01	-252.63	-256.66	-246.49
BIC	-162.04	-220.84	-219.39	-228.66	-233.18	-234.89	-229.56
DW	-2.07	1.99	1.97	1.98	2.15	2.20	2.16
$CUSUM$	0.86	0.42	0.73	0.36	0.45	0.40	0.34

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Annex #3: Different specifications for the intern price function

	(1)	(2)	(3)	(4)	**(5)**	(6)	(7)	(8)
ΔULC_t	0.04	-0.20***	-0.14**	-0.15**	-0.13**	-0.14**	-0.14**	-0.14**
ΔULC_{t-1}		-0.13						
ΔULC_{t-2}		0.21***	0.26***	0.27***	0.24***	0.25***	0.25***	0.25***
ΔPm_t	-0.12***	-0.11***	-0.11***	-0.11***	-0.13***	-0.11***	-0.11***	-0.11***
ΔPm_{t-3}					-0.11***	-0.12***	-0.12***	-0.11***
Δpc_t	0.01	0.01		0.01		0.03	0.03	0.03
Δpc_{t-1}						-0.02	-0.02	-0.01
Δpc_{t-2}							0.00	-0.01
Δpc_{t-3}								0.03**
Unit labor cost elasticity of intern prices								
e_{ULC}	0	0.01	0.12	0.12	0.11	0.11	0.11	0.11
N	87	85	85	85	84	84	84	84
adj. R^2	0.111	0.253	0.242	0.238	0.341	0.346	0.337	0.363
AIC	-432.84	-436.18	-436.79	-435.45	-442.29	-441.06	-439.09	-441.58
BIC	-422.98	-421.53	-427.02	-423.21	-430.13	-424.05	-419.65	-419.70
DW	2.00	1.79	1.72	1.79	1.73	1.88	1.89	1.82
$CUSUM$	0.42	0.47	0.72	0.5	0.88	0.64	0.79	0.42

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Annex #4 : Long-term relationship between imports and the ratio of intern and import prices

Lags	(1)	(2)	**(3)**	(4)	(5)	(6)	(7)	(8)
M_{t-1}	-0.16***	-0.22***	-0.21***	-0.21***	-0.25***	-0.19***	-0.19**	-0.17*
ϵ_{t-1}	0.22**	0.34***	0.37***	0.41***	0.45***	0.34**	0.33**	0.33*
$\frac{p}{P_m}_{t-1}$	0.22***	0.29***	0.26***	0.24***	0.30***	0.22**	0.23*	0.21
price ratio elasticity of imports								
$e_{\frac{p}{P_m}}$	1.38	1.31	1.24	1.14	1.2	1.16	1.21	0
N	87	86	85	84	83	82	81	80
adj. R^2	0.629	0.688	0.739	0.745	0.756	0.761	0.749	0.748
AIC	-255.97	-263.99	-273.26	-268.81	-268.39	-264.10	-254.69	-249.31
BIC	-241.18	-241.90	-243.95	-232.35	-224.85	-213.56	-197.22	-185.00
DW	1.71	1.97	2.10	1.98	1.85	2.04	1.96	1.97
$CUSUM$	-0.55	0.62	0.74	0.48	0.57	0.74	0.98	0.74

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Annex #5 : Difference specifications for the export function

	(1)	(2)	**(3)**	(4)	(5)	(6)	(7)	(8)
$\Delta RULC_t$	-0.36***	-0.36***	-0.32***	-0.31***	-0.32**	-0.33***	-0.28**	-0.35***
$\Delta\epsilon_t$	-0.37**	-0.40**	-0.39**	-0.37**		-0.44**		-0.37**
$\Delta\epsilon_{t-1}$	0.26	0.28*	0.28*			0.34*	0.25	
$\Delta\epsilon_{t-2}$	0.12				0.24			
$\Delta Y'_t$	-0.15	-0.16			-0.12			-0.19
$\Delta Y'_{t-1}$	0.80***	0.79***	0.86***	0.91***	0.88***		0.91***	0.82***
$\Delta Y'_{t-2}$	0.56**	0.57**	0.60**	0.67**	0.67**	0.26	0.67**	0.63**
ΔX_{t-1}	-0.50***	-0.49***	-0.47***	-0.49***	-0.50***	-0.41***	-0.45***	-0.51***
ΔX_{t-3}	-0.22**	-0.23**	-0.24**	-0.21**	-0.21**	-0.19*	-0.26**	-0.20*
Real unit labor cost elasticity of exports								
e_{RULC}	-0.21	-0.21	-0.19	-0.18	-0.19	-0.21	-0.16	-0.22
N	84	84	84	84	84	84	84	84
adj. R^2	0.371	0.375	0.380	0.365	0.334	0.293	0.342	0.360
AIC	-251.70	-253.10	-254.77	-253.59	-248.66	-244.56	-250.61	-252.01
BIC	-227.39	-231.23	-235.33	-236.57	-229.21	-227.55	-233.60	-232.56
DW	2.03	2.08	2.08	2.00	2.01	2.19	2.03	2.01
$CUSUM$	0.87	0.86	1.00	1.07	0.77	0.81	0.95	0.82

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Annex #6: Multiplier regressions (Investment)

	(1)	(2)	(3)	(4)	**(5)**	(6)	(7)	(8)
I_{t-1}	-0.34***	-0.22***	-0.12*	-0.12**	-0.17***	-0.13**	-0.14**	-0.13*
Y_{t-1}	0.57***	0.37***	0.21*	0.23**	0.31***	0.25**	0.25**	0.24*
Long run elasticities (accelerator effect)								
$e_{I/Y}$	1.66	1.65	1.73	1.91	1.82	1.85	1.85	1.88
N	87	86	85	84	83	82	81	80
adj. R^2	0.831	0.872	0.890	0.927	0.938	0.941	0.942	0.940
AIC	-232.23	-250.52	-258.16	-288.47	-298.25	-296.22	-290.41	-285.09
BIC	-222.37	-235.79	-238.62	-264.16	-269.22	-262.53	-252.10	-242.22
DW	1.77	2.14	2.04	1.99	1.76	1.99	1.98	1.84
$CUSUM$	1.14	0.56	0.42	0.39	0.69	0.41	0.49	0.74

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Annex #6: Multiplier regressions (Imports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
M_{t-1}	-0.13*	-0.17**	-0.11	-0.17***	-0.13**	-0.13*	-0.12	-0.13*
Y_{t-1}	0.22*	0.29**	0.17	0.31***	0.24**	0.24*	0.21	0.23*
Long run elasticities (income elasticity of imports)								
$e_{M/Y}$	1.66	1.67	1.59	1.82	1.81	1.82	1.77	1.81
N	87	86	85	84	83	82	81	80
adj. R^2	0.136	0.164	0.230	0.517	0.522	0.508	0.512	0.490
AIC	-258.93	-256.24	-257.91	-292.69	-287.28	-278.71	-273.32	-268.05
BIC	-249.07	-241.52	-238.37	-268.38	-258.26	-245.02	-235.01	-225.18
DW	1.65	1.87	1.83	1.81	2.00	1.97	1.91	1.91
$CUSUM$	0.32	0.39	0.43	0.40	0.44	0.52	0.64	0.61

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Annex #7: Structural break test for the consumption fuction

Bai-Perron Test (Sequential F-statistic determined breaks: 2)				
Break Test	F-statistic	Scaled F-statistic	Critical Value**	Break Date
0 vs. 1*	3.74	67.4	25.8	2009Q2
1 vs 2*	5.85	105.3	27.8	2004Q2-2010Q4
*Significant at the 0.05 level ** Bai-Perron critical values.				

Chow Test (Null Hypothesis: No breaks at specified breakpoints)			
Break Date	F-statistic Prob. F(18,47)	Log likelihood ratio Prob. Chi-Square(18)	Wald Statistic Prob. Chi-Square(18)
20009Q2	0.0012	0.0000	0.0000
2004Q2	0.351	0.038	0.31
2010Q4	0.087	0.002	0.041

Empirical Annex #8: The consumption function in sub-periods

	1996Q1-2009Q1					2009Q3-2017Q4	
	(1)	(2)	**(3)**	(4)		(5)	**(6)**
C_{t-1}	-0.97***	-1.33***	-1.61***	-1.11***	ΔC_{t-1}		-0.26***
W_{t-1}	0.73***	0.87***	1.02***	0.71***	ΔW_t	1.41***	1.12***
P_{t-1}	0.32***	0.49***	0.59***	0.40***	ΔP_t	0.70***	0.60***
Marginal propensities to consume							
Out of Wages	0.75	0.65	0.64	0.64		1.41	0.89
Out of Profits	0.33	0.37	0.37	0.36		0.70	0.48
N	52	51	50	50		34	34
adj. R^2	0.803	0.879	0.923	0.879		0.792	0.838
AIC	-202.28	-220.28	-218.12	-212.47		-143.53	-150.99
BIC	-190.57	-202.90	-200.92	-189.53		-138.95	-144.88
DW	2.05	1.72	1.94	1.90		2.24	2.08
$CUSUM$	-0.31	0.88	-	0.74		0.60	0.59

$^{*}\ p < 0.10$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$

Empirical Annex #9: Structural break test for the investment fuction

Bai-Perron Test (Sequential F-statistic determined breaks: 1)				
Break Test	F-statistic	Scaled F-statistic	Critical Value**	Break Date
0 vs. 1*	3.17	22.19	21.87	2000Q2
1 vs 2	2.00	14.01	24.17	-
*Significant at the 0.05 level ** Bai-Perron critical values.				

Chow Test (Null Hypothesis: No breaks at specified breakpoints)			
Break Date	F-statistic Prob. F(7,72)	Log likelihood ratio Prob. Chi-Square(7)	Wald Statistic Prob. Chi-Square(7)
2000Q2	0.043	0.019	0.030

Empirical Annex #10: The investment function in sub-periods

	1996Q1-2000Q1			2000Q3-2017Q4		
	(1)	(2)	(3)	(4)	(5)	(6)
ΔPs_t	-0.52	-2.54***		-0.95**	-0.43	
ΔPs_{t-1}	3.71**	3.82***	2.27**	0.79*	0.66*	0.68*
ΔY_t	3.25***	3.10***	4.03***	2.14***	2.13***	3.21***
ΔY_{t-1}	-2.16***	-2.22***	-2.26***	-1.54***	-1.66***	-1.13***
Δpc_t	-0.10			-0.17***	-0.17***	-0.20***
Δpc_{t-1}	-0.20			0.15***	0.12***	0.15***
ΔI_{t-2}		0.34**	0.16*		-0.16***	
ΔI_{t-3}			0.48**			0.37***
Profit share elasticity of investment						
e_{ps}	3.71	1.94	6.31	-0.24	0.57	1.08
N	15	14	13	70	70	70
adj. R^2	0.912	0.960	0.952	0.892	0.909	0.910
AIC	-41.62	-48.89	-43.60	-210.41	-221.89	-222.94
BIC	-36.66	-45.06	-40.21	-194.67	-203.90	-207.20
DW	1.22	2.00	1.58	1.83	1.60	1.91
$CUSUM$	0.92	0.57	0.34	0.42	0.45	0.40

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Annex #11: Structural break test for the intern prices function

Bai-Perron Test (Sequential F-statistic determined breaks: 0)				
Break Test	F-statistic	Scaled F-statistic	Critical Value**	Break Date
0 vs. 1	2.38	11.92	18.23	-
*Significant at the 0.05 level ** Bai-Perron critical values.				

Empirical Annex #12: Structural break test for the import fuction

Bai-Perron Test (Sequential F-statistic determined breaks: 2)				
Break Test	F-statistic	Scaled F-statistic	Critical Value**	Break Date
0 vs. 1*	3.62	43.51	26.38	2008Q2
1 vs. 2*	6.01	72.07	28.56	2012Q4
2 vs. 3	0.67	7.99	29.62	-

*Significant at the 0.05 level ** Bai-Perron critical values.

Chow Test (Null Hypothesis: No breaks at specified breakpoints)			
Break Date	F-statistic Prob. F(12,61)	Log likelihood ratio Prob. Chi-Square(12)	Wald Statistic Prob. Chi-Square(12)
20008Q2	0.0002	0.0000	0.0000
2012Q4	0.0081	0.0005	0.0021

Empirical Annex #13: The import function in sub-periods

	1996Q1-2008Q1			2008Q3-2012Q3		2013Q1-2017Q4		
	(1)	**(2)**	(3)	(4)	**(5)**	(6)	(7)	**(8)**
M_{t-1}	-0.20***	-0.22***	-0.30***					
ϵ_{t-1}	0.33***	0.35***	0.49***					
$\frac{p}{P_m}_{t-1}$	0.22***	0.24***	0.32***					
$\Delta\epsilon_t$				2.46***	2.17***	2.14**	1.34**	1.69***
ΔM_{t-1}					0.52	0.50		
$\Delta\frac{p}{P_m}_{t-1}$				0.43	1.06*	1.04*		
$\Delta\frac{p}{P_m}_{t-2}$							0.93*	1.09**
ΔY_t						0.08		0.69**
price ratio elasticity of imports								
$e_{\frac{p}{P_m}}$	1.1	1.09	1.07	0	1.06	1.04	0.93	1.09
N	47	46	46	17	17	17	20	20
adj. R^2	0.748	0.816	0.776	0.408	0.460	0.416	0.249	0.445
AIC	-175.34	-179.85	-174.88	-25.20	-26.01	-24.04	-49.44	-54.68
BIC	-158.69	-163.39	-152.94	-22.70	-22.68	-19.88	-46.45	-50.70
DW	2.29	2.11	2.13	1.44	1.95	1.92	1.88	1.92
CUSUM	0.86	-	1.10	0.53	0.50	0.23	0.28	0.62

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Annex #14: Structural break test for the export fuction

Bai-Perron Test (Sequential F-statistic determined breaks: 1)				
Break Test	F-statistic	Scaled F-statistic	Critical Value**	Break Date
0 vs. 1*	8.91	53.44	20.08	2004Q2
1 vs 2	1.27	6.64	22.1	-
*Significant at the 0.05 level ** Bai-Perron critical values.				

Chow Test (Null Hypothesis: No breaks at specified breakpoints)			
Break Date	F-statistic Prob. F(6,72)	Log likelihood ratio Prob. Chi-Square(6)	Wald Statistic Prob. Chi-Square(6)
2004Q2	0.000	0.000	0.000

Empirical Annex #15: The export function in sub-periods

	1996Q1-2004Q1				2004Q3-2017Q4			
	(1)	**(2)**	(3)	(4)	(5)	(6)	(7)	**(8)**
$\Delta RULC_t$	-0.49*	-0.44*	-0.67	-0.71	-0.22**	-0.22**	-0.24***	-0.25***
$\Delta \epsilon_t$	-0.59***	-0.57***	-0.54**	-0.42*	-0.11	-0.11		-0.11
$\Delta \epsilon_{t-1}$	0.53***	0.38**	0.78***		-0.01		-0.02	
$\Delta Y'_t$	-3.41***	-3.81***			0.19	0.19		
$\Delta Y'_{t-1}$	3.74***	2.65***	6.79***	5.64***	0.51**	0.50**	0.43**	0.44**
$\Delta Y'_{t-2}$	2.56***	1.88**	0.50	0.57	0.80***	0.80***	0.77***	0.75***
ΔX_{t-1}	-0.36**	-0.45***	0.17	-0.09	-0.60***	-0.60***	-0.65***	-0.65***
ΔX_{t-2}		-0.20**	-0.03	-0.21	-0.23*	-0.23*	-0.24*	-0.23*
Real unit labor cost elasticity of exports								
e_{RULC}	-0.36	-0.27	0.00	0.00	-0.12	-0.12	-0.13	-0.13
N	30	30	30	30	54	54	54	54
adj. R^2	0.915	0.930	0.777	0.673	0.559	0.569	0.567	0.572
AIC	-131.50	-137.04	-102.70	-91.89	-203.27	-205.26	-205.81	-206.43
BIC	-120.29	-124.42	-91.49	-82.08	-185.36	-189.35	-191.89	-192.51
DW	2.17	2.10	1.98	2.19	1.93	1.94	1.84	1.86
$CUSUM$	0.49	0.58	0.42	0.77	0.60	0.68	0.68	0.66

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Annex #16: Mean Values of the sample

Period	C/W	C/P	I/P	X/Y	M/Y	$RULC$	Y_{FC}
1996Q1-2017Q4	2.177	1.009	0.376	0.34	0.31	0.29	0.91
2017Q1-2017Q4	2.158	0.997	0.344	0.287	0.27	0.29	0.91
1996Q1-2000Q1	2.047	1.122	0.443	0.271	0.28	0.32	0.91
2000Q3-2004Q1	2.046	1.104	0.373	0.336	0.30	0.32	0.91
2004Q3-2008Q1	2.297	0.899	0.334	0.427	0.31	0.26	0.92
2008Q3-2009Q1	2.378	0.97	0.413	0.392	0.40	0.26	0.91
2009Q3-2012Q3	2.205	0.927	0.349	0.37	0.33	0.27	0.92
2013Q1-2017Q4	2.226	0.997	0.37	0.303	0.30	0.28	0.91