

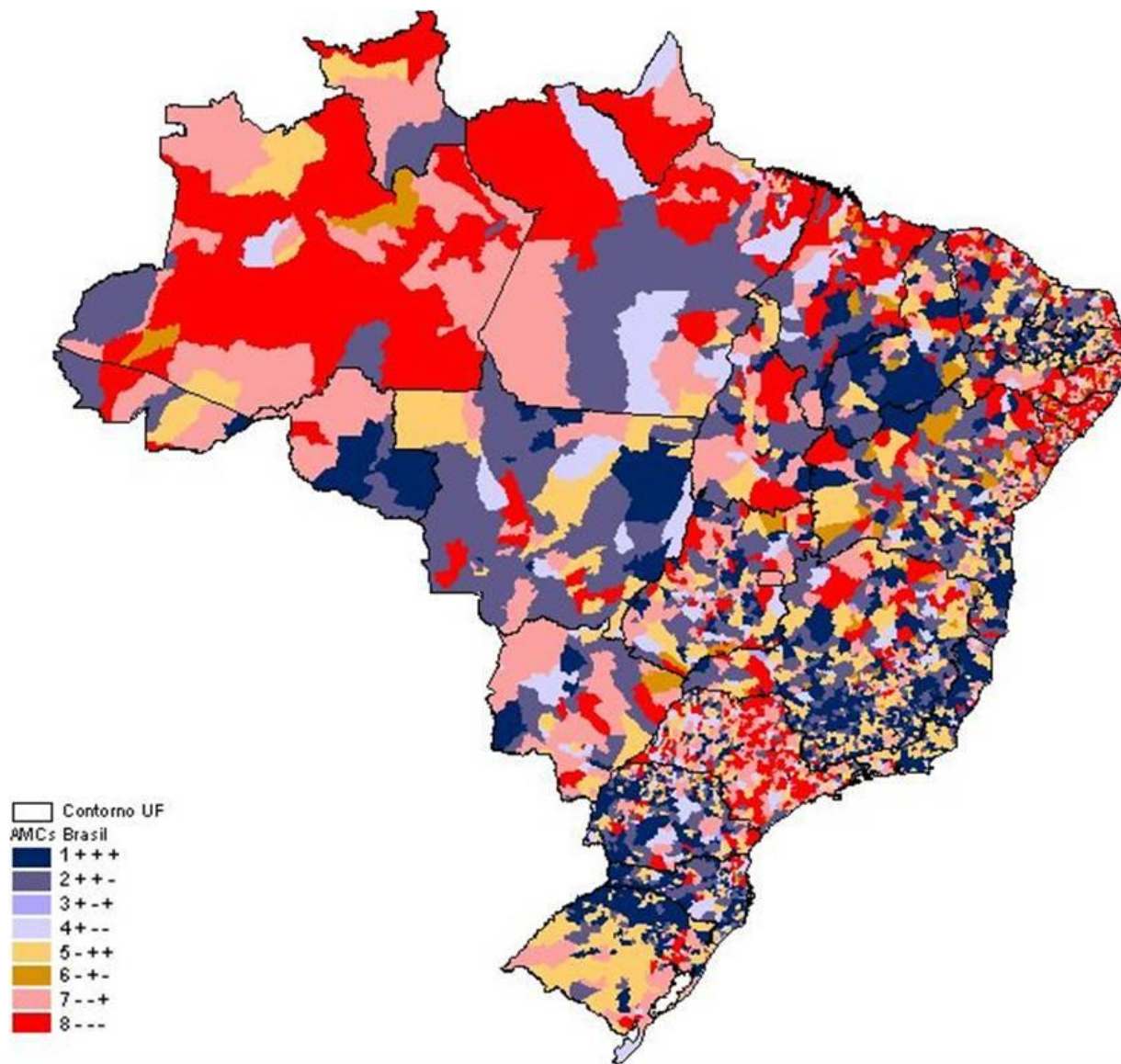
Determinants of spatial distribution of agri-processors and impacts on employment and poverty: Evidence from Latin América

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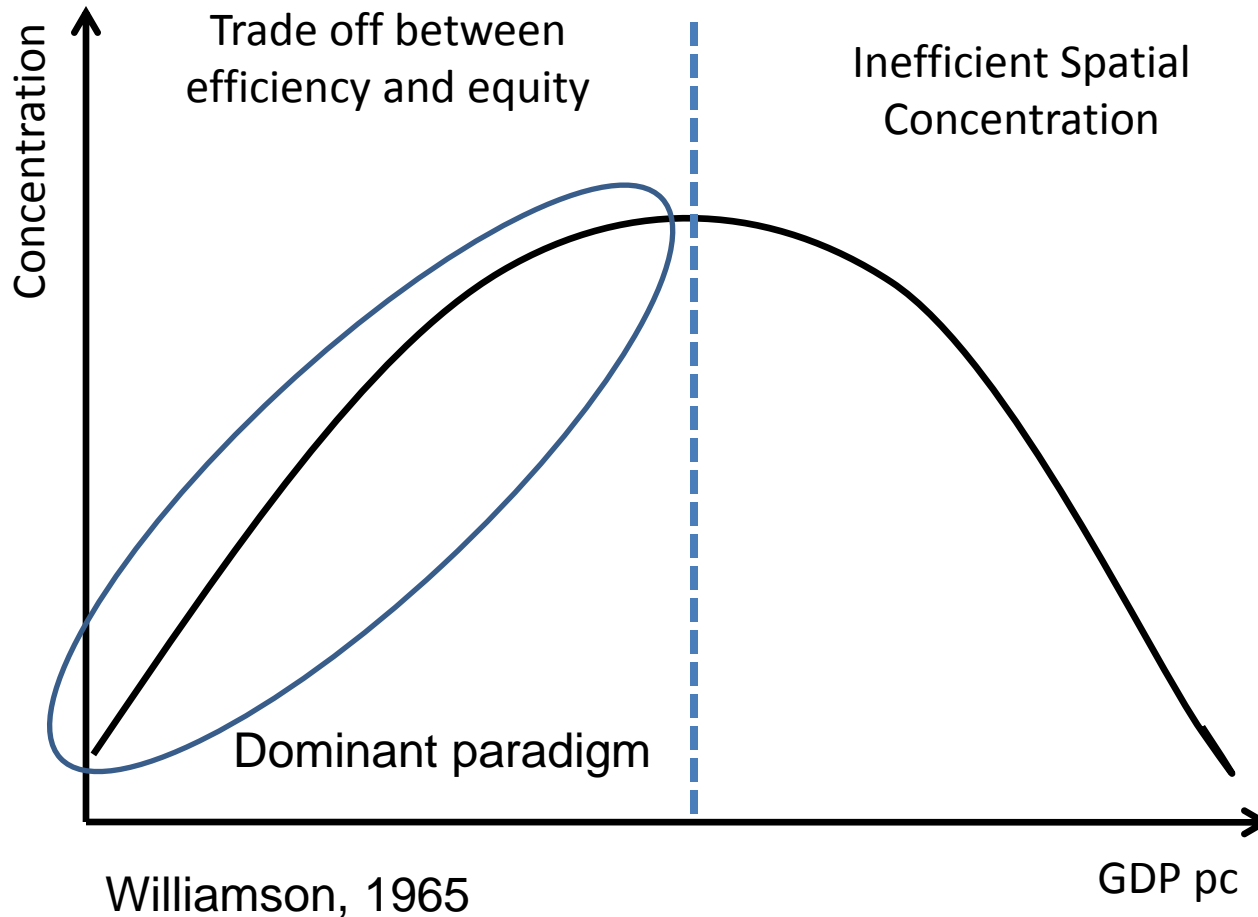




Territorial inequality in Latin America

- ▶ Income inequality among individuals has been decreasing in most of Latin America over the past decade (Birdsall et al., 2011)
- ▶ However, territorial inequality within countries persists and, in some cases, increases over time:
 - ▶ Chile: 27% of total inequality (Ramírez et al. 2009)
 - ▶ Peru: 6% of total inequality in 1993, 25% in 2007 (Escobal & Ponce, 2011)
- ▶ Territories characterised by economic growth and concentration of economic activity coexist with localised poverty and inequality traps (Berdegué & Modrego, 2012)
- ▶ This is not only ethically undesirable, but also economically inefficient

Territorial inequality and national economic growth





Territorial inequality and national economic growth

- ▶ **Williamson hypothesis (1965): there is an inverted-U relationship between economic growth and territorial inequality over time**
- ▶ At the beginning of the development process, increasing economic concentration can be beneficial for growth thanks to agglomeration economies (Hansen 1965; 1990)
- ▶ At later stages, increasing concentration slows down the **aggregate** economic growth of the country (Brülhart y Sbergami, 2009; Cerina & Mureddu 2011)



Territorial inequality and national economic growth

- ▶ In theory, once the costs of agglomeration (commuting, congestion, etc) outweigh its benefits, a process of deconcentration of economic activity should start (Henderson 1995; Glaeser et al 1992)
- ▶ In practice, this may not occur, due to a conflict between private and social benefits, and for political economy reasons (Ades y Glaeser 1995; Davis y Henderson 2003)



Territorial inequality and national economic growth: the role of private investment

- ▶ Location decision of private firms follows the objective of maximisation of expected benefits
- ▶ Agglomeration externalities and private versus social benefits:
 - ▶ Even when congestion and commuting costs become very high in the economic centre, a firm may have little incentive to (re)locate to a region with lower levels of economic activity
 - ▶ Outside the centre, the firm would forego the benefits of agglomeration economies
 - ▶ In the centre, remaining firms would benefit from the reduction of agglomeration costs, with no compensation for the moving firm
- ▶ Inertia and path dependence in the spatial distribution of private firms reinforce territorial inequality, and this implies an efficiency cost for the country as a whole



Research questions

- ▶ How does formal private agri-processing investment distribute in space within Chile, Mexico and Peru and how does it change over time in the post-liberalisation period?
- ▶ What are the local characteristics that affect agri-processors' decision to locate in a particular territory?
- ▶ What are the effects of the presence of agri-processors on local employment and poverty?



Agri-processing and territorial inequality: our main hypotheses

- ▶ **Hypothesis 1:** Agri-processing has the potential to contribute to a more decentralised economic development
- ▶ This is due to their relationship with agricultural production and rural areas, which gives them
 - ▶ lower incentives to locate in metropolitan areas
 - ▶ more incentives to locate in intermediate cities that are closely linked to rural territories
- ▶ **Hypothesis 2:** The importance of different location factors varies depending on firm size; in particular, larger firms are more likely than smaller ones to consider a broad range of factors



We disaggregate by firm size

- ▶ **Hypothesis 3a:** Agri-processing has a larger multiplier effect on employment and a larger poverty elasticity to growth compared to other sectors, due to its labour intensive nature
- ▶ **Hypothesis 3b:** On aggregate, medium and small agri-processors have an advantage over large ones in employment creation and poverty reduction, due to stronger linkages with the local economy



Methods

- ▶ Agri-processors' location decision:
 - ▶ Description of the change over time in spatial distribution of establishments
 - ▶ Determinants of growth in number and revenues of agri-processing establishments: interviews and econometric analysis following Lambert & McNamara 2009 (*Agricultural Economics*)
- ▶ Effects on employment: Local multipliers
 - ▶ The effect of a change in agri-food employment over local employment in other sectors, following Moretti 2010 (*AER*)
- ▶ Effects on poverty:
 - ▶ Poverty elasticity to growth in agri-processing versus other sectors, following Ravallion y Datt 2002 and Suryahadi et al 2009 (*JDE*)



Data

▶ **Chile:**

- ▶ Encuesta Nacional Industrial Anual 1995, 2003, 2009
- ▶ Census 1992 and 2002
- ▶ Casen 1990-2009
- ▶ Analysis at the level of "*comunas*" (location decision), functional territories (multiplier), regions (poverty elasticity)

▶ **Mexico**

- ▶ Enconomic census 1999 and 2000
- ▶ INEGI
- ▶ Census 1990, 2000, 2010
- ▶ Analysis at the level of "*municipios*" and functional territories

▶ **Perú**

- ▶ Economic census 1993 and 2008
- ▶ Population census 1993 and 2007
- ▶ Agricultural census 1994
- ▶ Analysis at the level of "*distritos*"



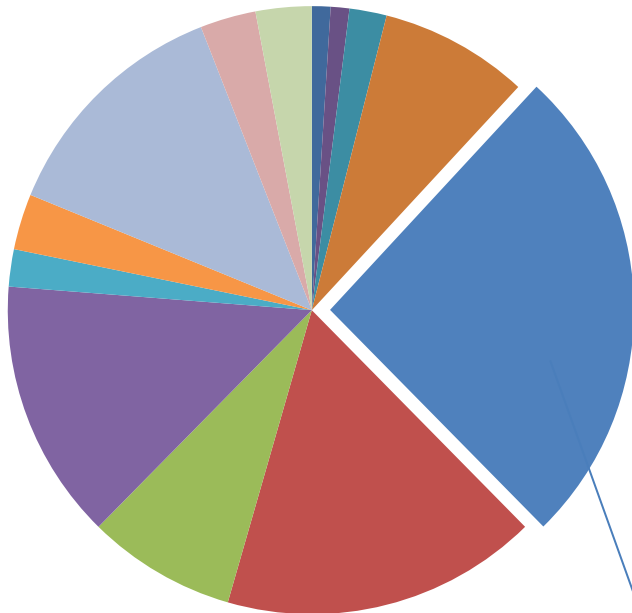
Results



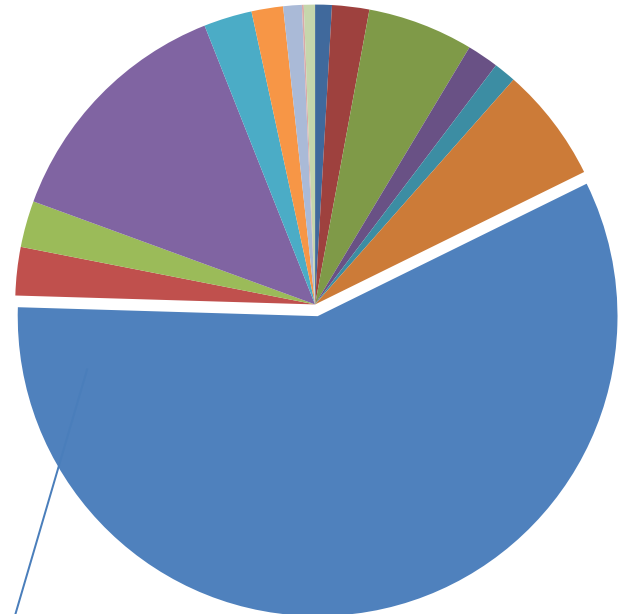
In the three countries, the agri-processing sector is less concentrated than the rest of the manufacturing sector

CHILE

Agri-processing employment



Employment in the rest of manufacture



Región Metropolitana: 26% of agri-food employment versus 59% of employment in the rest of the manufacturing sector



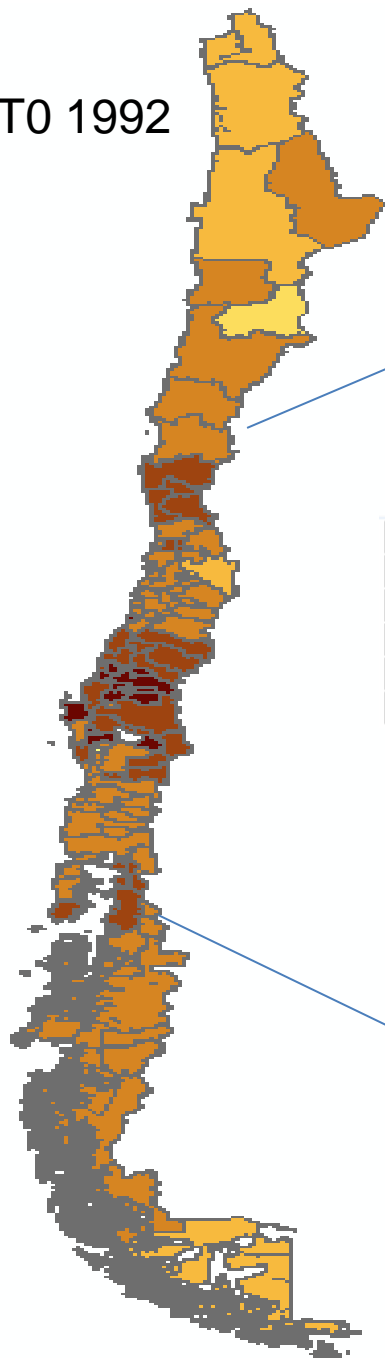
Agri-processing firms move towards middle- and lower-income territories over time ...

- ▶ Initial characteristics of territories with new agri-processing establishments, compared to territories with at least one before 1995:
 - ▶ Lower income per capita and higher poverty rates
 - ▶ Lower proportion of high-skilled and specialised workers
 - ▶ Lower presence of financial services

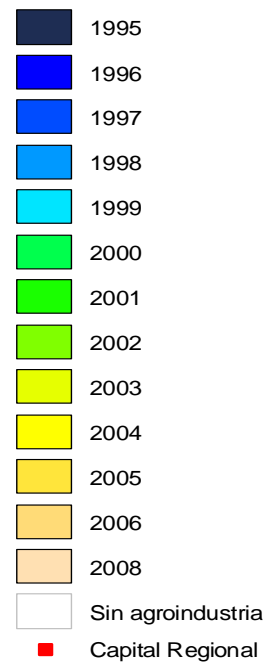
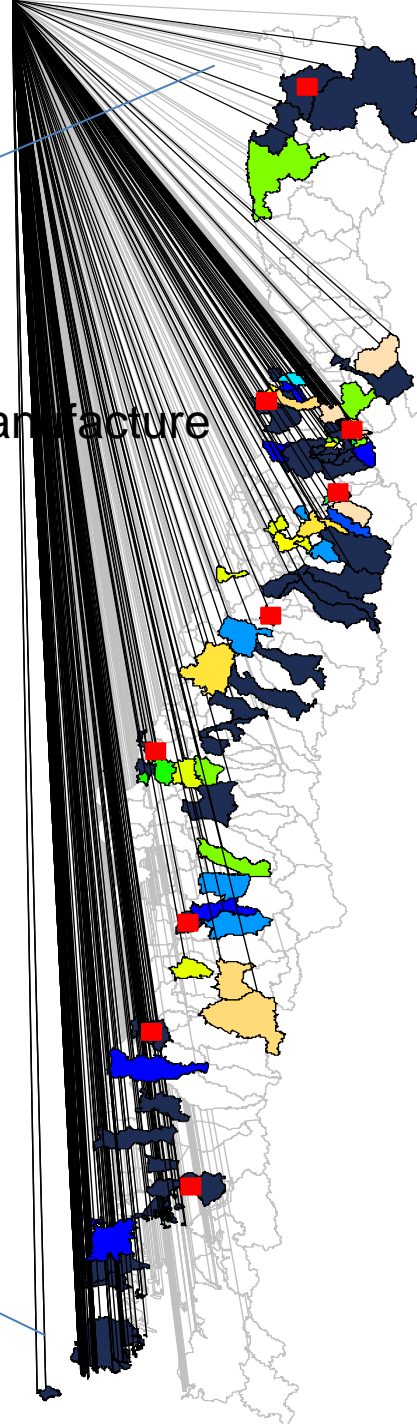


FGT0 1992

CHILE



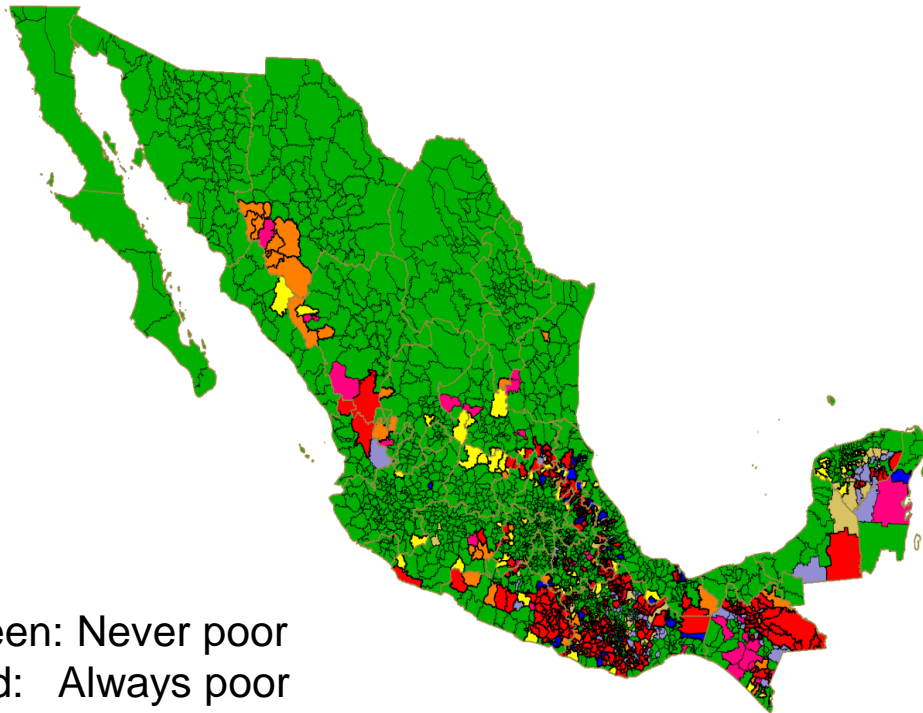
Food manufacture diffusion



... But not towards the poorest territories

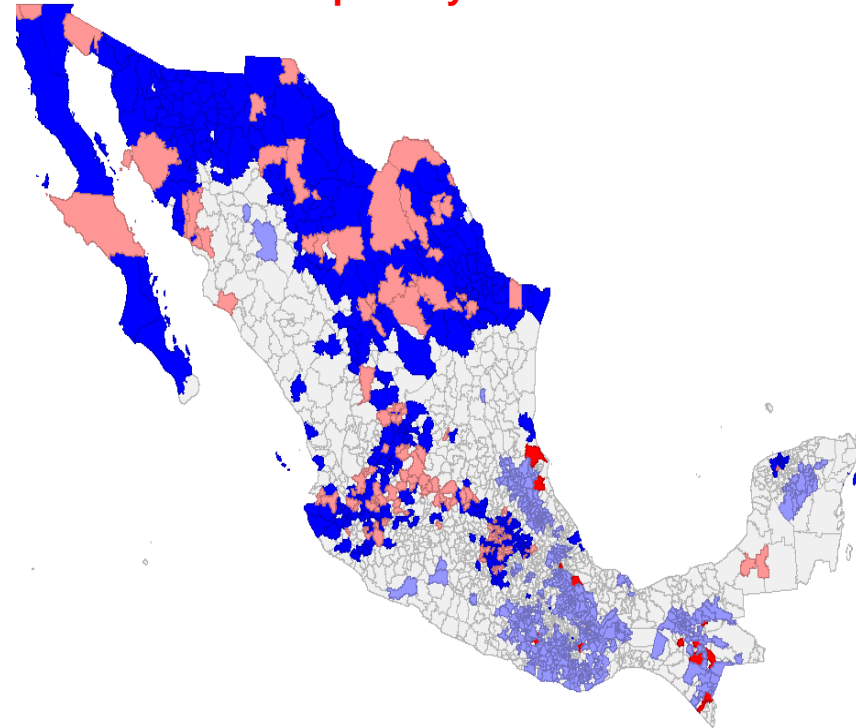
MEXICO

Transitions in- and out- of poverty,
1990-2000-2010



Green: Never poor
Red: Always poor

Employment growth in agri-processing
versus initial poverty rate in 2000



Blue: Low growth, low FGT0
Pink: High growth, low FGT0
Red: High growth, high FGT0
Lilac: Low growth, high FGT0



Firm location decision: Empirical model (Lambert and McNamara 2009)

- ▶ **$z_{ij} = g(A_j, C_j, M_j, L_j, I_j, F_j)$**
- ▶ **z_{ij}** is location decision of firm i in municipality j
- ▶ **A, C, M, L, I, F** are vectors of attributes of the territory:
 - ▶ Agglomeration factors (A):
 - ▶ Specialisation, diversity, competition
 - ▶ Access to inputs (C):
 - ▶ Availability of raw materials, irrigation, agrarian structure
 - ▶ Access to output markets (M):
 - ▶ Distance to cities, average income
 - ▶ Human capital and labour market (L):
 - ▶ Labour force participation, higher education
 - ▶ Infrastructure and services (I):
 - ▶ Roads, water, electricity, financial services
 - ▶ Initial conditions: Poverty and inequality (F)



Estimation method

- ▶ **Growth in number of firms: count data**
 - ▶ Negative binomial model
 - ▶ With spatial lag of the dependent variable
 - ▶ Correction for possible spurious spatial correlation using a “spatial filtering” method (Griffith 2002)
 - ▶ With spatial lag of explanatory variables (Modelo espacial de Durbin)
- ▶ **Growth in sales revenues: continuous data**
 - ▶ OLS
 - ▶ Spatial-lag model
 - ▶ Spatial-error model
- ▶ **Spatial weights matrix: contiguity and inverse distance**
 - ▶ Similar results
 - ▶ We prefer and report inverse distance matrix results



Access to raw materials, human capital and infrastructure are key for growth in the number of establishments and in their revenues

- ▶ In particular
 - ▶ Agricultural output and irrigation
 - ▶ Labour availability
 - ▶ Presence of technical education facilities (Peru and Mexico)
 - ▶ Good provision of water and electricity (Chile and Peru)



The importance of local characteristics varies across firm size

- ▶ In Chile and Mexico, large agri-processors take a number of factors into account, including
 - ▶ Raw materials availability
 - ▶ Human capital availability and quality
 - ▶ Labour force participation of women
 - ▶ Infrastructure (water, electricity)
 - ▶ Land price
- ▶ Small agri-processors seem to just focus on availability of raw materials and labour, and on the owner's relationship with and commitment to the community
- ▶ Large firms seem to be choosing, small ones seem to locate where their owner is

What is the capacity of agri-processing to generate jobs in other sectors?

$$E_{c,t}^{NT} - E_{c,t-s}^{NT} = \beta_0 + \beta_1(E_{c,t}^{AI} - E_{c,t-s}^{AI}) + \beta_2(E_{c,t}^{OM} - E_{c,t-s}^{OM}) + \beta_3 year + \varepsilon_{c,t}$$

$$\varepsilon_{c,t} = \mu_c + V_{c,t}$$

▶ where

- ▶ $E_{c,t}^{NT}$ = employment in non-tradable sector in territory c and time t
- ▶ $E_{c,t-s}^{NT}$ = employment in non-tradable sector in territory c and time t-s
- ▶ $E_{c,t}^{AI}$ = employment in agri-processing in territory c and time t
- ▶ $E_{c,t-s}^{AI}$ = employment in agri-processing in territory c and time t-s
- ▶ $E_{c,t}^{OM}$ = employment in the rest of tradable, in c and time t
- ▶ $E_{c,t-s}^{OM}$ = employment in the rest of tradable, in c and time t-s
- ▶ $\beta_2 year$ = time trend
- ▶ $\varepsilon_{c,t}$ = error term: time-invariant region-specific effects, and a random component
- ▶ **β_1 represents the multiplier effect we seek to estimate**



The agri-processing sector has the potential to create employment in other sectors

- ▶ Employment growth in the agri-food sector has a positive multiplier effect on
 - ▶ the rest of the manufacturing sector: in Chile and Mexico, with an elasticity between 0.8 and 1.8, driven by large agri-processors
 - ▶ the service sector (Peru)
- ▶ Growth in agri-food seems to crowd out employment in services and agriculture in Chile
- ▶ But when disaggregating by firm size, small agri-processors in Chile have a strong positive multiplier effect on local employment in agriculture and services
- ▶ The capacity to create jobs is heterogeneous across regions of the same country...
 - ▶ E.g. stronger outside the capital in Chile

Poverty elasticity to growth in agri-processing: Empirical model

$$dP_i = \alpha_i + \beta dY_i + \gamma dS_i + \delta P_i + \theta GOV_i + \rho_{ij} R_{ij} + \varepsilon$$

Where:

- ▶ dP_i = change in regional poverty measure
- ▶ βdY_i = percentage change in GDP per cápita in the region, weighted by its share in total GDP, disaggregated by sectors

$$Y_i = Y_i^{AGRO} + Y_i^{OM} + \sum_{k=5}^s Y_i^k$$

- ▶ γdS_i = change in the share of population in the region
- ▶ δP_i = initial poverty rate in the region
- ▶ θGOV_i = public expenditure in the region
- ▶ $\rho_{ij} R_{ij}$ = initial conditions: infrastructure, human capital, inequality



The agri-processing sector has the potential to reduce poverty: Chile

- ▶ At national level, similar elasticity to that of other labour intensive sectors, but larger compared to mining, services and utilities
- ▶ Strong geographical heterogeneity, but with larger elasticities in the regions with agro-ecology favourable to agriculture



Regional agri-food growth and national poverty reduction in Chile

Regiones	Growth in income per capita of agri-processing sector workers (% per annum 1990-2009)	Estimation of the effect of a 1% increase in the annual growth of labour incomes in the agri-food sector over national poverty reduction trends		
		FGT0	FGT1	FGT2
Antofagasta	7.35%	0.515	0.685	0.459
Atacama	7.99%	3.234	1.071	0.472
Coquimbo	8.29%	-3.136	-1.509	-1.101
Valparaíso	9.25%	1.125	0.431	0.155
O'Higgins	11.37%	0.024	0.004	-0.003
Maule	9.89%	-0.117	-0.041	-0.034
Bio Bio	10.05%	0.309	0.204	0.175
Araucanía	9.67%	-2.731	-1.723	-1.245
Los Lagos	8.87%	-0.137	-0.152	-0.130
Aysén	9.53%	-0.710	-0.391	-0.271
Magallanes	8.05%	-0.358	0.696	0.775
Metropolitana	8.92%	-0.167	0.340	0.367



Conclusions

- ▶ The agri-food sector is less concentrated than the rest of manufacture
- ▶ It has the capacity to generate local employment in other sectors and to reduce poverty, although this varies across geographical regions and firm size
- ▶ A territorial development approach led by agri-processing?
 - ▶ Where there is natural, agro-ecological potential
 - ▶ Probably unfeasible in the poorest territories, but feasible in middle and lower income ones
 - ▶ The establishment of an agri-processor says nothing, per se, about inclusive growth: if the political/normative objective is poverty reduction, a prior assessment of its expected poverty and employment effects is necessary
 - ▶ If decision-makers decide to encourage agri-processing development, the good news is that the location factors that seem to be relevant for agri-processing are mostly public goods and services that are not industry-specific, and which, once in place, could generate positive spillovers



Next steps

- ▶ Disaggregation of poverty elasticity between urban and rural areas
- ▶



Appendix – Tables of Results

Peso relativo de las regiones en el sector manufacturero, excluyendo industria agroalimentaria: % de la región sobre el total nacional de N° de empresas, empleo e ingresos por ventas, 1995, 2003, 2009

	% del Número de Empresas			% de Empleo			% de Ingresos por ventas		
	1995	2003	2009	1995	2003	2009	1995	2003	2009
Arica	1.2	1	1.1	1.3	1.1	0.9	1.9	1.3	0.2
Tarapacá	1.2	1.1	2.1	0.9	1.2	2	1.8	2.6	6.1
Antofagasta	2.4	2.7	2.8	3.1	5.3	5.7	10.1	19	32
Atacama	1	1.2	1.4	0.8	1.3	1.7	3.8	4.1	5.5
Coquimbo	1.4	1.6	1.8	0.7	1.1	1.2	0.4	0.6	2.5
Valparaíso	7.5	6.8	6.7	6.2	5.6	6.2	15.2	12.9	9.7
Metropolitana	65.3	62.1	59.5	65.7	60.1	57.7	39.1	29.9	23.5
O'Higgins	2.1	2	2.9	1.8	2.6	2.6	3.7	3.4	4.6
Maule	3.3	3.7	3.2	2.7	3.2	2.5	2.7	2.9	1.3
Biobío	9.5	11.4	10.6	11.6	13.6	13.4	16.3	17.7	11.5
Araucanía	1.9	2.8	3.2	2.2	2.7	2.6	2.1	1.7	1.2
Los Ríos	0.9	0.9	1.3	1.4	0.6	1.7	0.8	0.5	0.9
Los Lagos	1.3	1.8	2.4	0.9	1.2	1	0.7	0.6	0.3
Aysén	0.3	0.3	0.3	0.2	0.1	0.1	0	0	0
Magallanes	0.6	0.6	0.7	0.4	0.4	0.6	1.3	2.8	0.9

Peso relativo de las regiones en la industria agroalimentaria: % de la región sobre el total nacional de N° de empresas, empleo e ingresos por ventas, 1995, 2003, 2009

	% del Número de Empresas			% de Empleo			% de Ingresos por ventas		
	1995	2003	2009	1995	2003	2009	1995	2003	2009
Arica	2	1	1	1	1	1	2	1	0
Tarapacá	2	1	0	1	1	0	3	2	0
Antofagasta	2	1	1	1	1	0	2	1	0
-Atacama	1	1	0	1	1	1	1	0	0
Coquimbo	4	3	5	5	3	2	2	2	2
Valparaíso	10	9	9	9	6	8	10	5	6
Metropolitana	26	26	26	30	27	26	30	31	27
O'Higgins	5	7	11	5	8	17	7	6	24
Maule	7	10	11	7	8	8	6	8	9
Biobío	15	18	14	14	16	14	17	17	11
Araucanía	3	6	5	2	1	2	2	2	2
Los Ríos	3	3	2	2	2	3	3	3	4
Los Lagos	14	11	12	17	23	13	13	18	13
Aysén	1	1	0	2	2	3	2	4	1
Magallanes	4	3	3	2	2	3	2	2	1

Location determinants: Chile

	(1)	(2)	(3)	(4)
	NSnbreg*	ESnbreg*	Filtering*	DSnbreg*
Cociente de localizacion	0.390*** (0.148)	0.401*** (0.147)	0.469*** (0.161)	0.429*** (0.165)
Concentracion agroind en la region	-0.857 (1.244)	-0.617 (1.257)	-0.588 (1.425)	-0.339 (1.458)
Sup cultivada en 1993	0.122** (0.061)	0.132** (0.062)	0.100 (0.068)	0.150* (0.085)
Pobl Economicam Activa	1.171*** (0.216)	1.065*** (0.235)	1.066*** (0.257)	1.041*** (0.253)
Partic laboral mujeres	-0.000 (0.042)	0.003 (0.042)	0.064 (0.045)	0.075* (0.044)
% Pobl con educ superior	-0.033 (0.064)	-0.028 (0.064)	-0.120* (0.072)	-0.144** (0.074)
% trabajadores calificados	-0.053* (0.031)	-0.053* (0.031)	-0.036 (0.031)	-0.048 (0.032)
N bancos	-0.063* (0.034)	-0.053 (0.034)	-0.055 (0.034)	-0.027 (0.032)
Linea ferrea	0.637** (0.315)	0.612* (0.314)	0.257 (0.332)	0.192 (0.338)
% viviendas con electricidad	-0.023 (0.018)	-0.023 (0.018)	-0.006 (0.023)	-0.007 (0.022)
% viviendas con agua potable	0.032 (0.021)	0.030 (0.020)	0.018 (0.022)	0.015 (0.021)
% hogares con celular	0.278 (0.222)	0.218 (0.228)	0.300 (0.222)	0.316 (0.227)
Rezago espacial		3.103 (2.837)	-5.967 (4.340)	-11.633** (5.298)
Pobl comunas vecinas				5.250** (2.459)
Sup cultivada comunas vecinas				0.175 (0.760)
Constant	-12.728*** (1.817)	-12.647*** (1.808)	-11.535*** (2.211)	-57.656** (23.842)
Observations	342	342	342	342
Pseudo R ²	0.15	0.16	0.18	0.19

Location determinants: Mexico

Var dep. crec9808	LMNS	LMESL	LMSF	durblm
AGRIMIL	0.000966*	0.000950*	0.000952*	0.00100*
POPMIL	0.00267***	0.00264***	0.00265***	0.00271***
POPTOTMIL	-	-	-	-
FRMLND	0.576*	0.585*	0.586*	0.587**
LAND	0.0000930*	0.0000987*	0.000100*	0.0000861*
UNEM	0.0783	0.0738	0.0681	0.0678
HS00	1.772**	1.726**	1.639**	1.636**
PCI	-0.0000471	-0.0000479	-0.0000357	-0.0000366
MFWAGE	-0.000705	-0.000671	-0.000742	-0.000807
MFGS	6.461**	6.348**	6.359**	6.259***
MEMP	2.663**	2.674**	2.671**	2.713***
EDUC	0.602***	0.594***	0.598***	0.590***
INTER	-0.00156	-0.0015	-0.00148	-0.00129
RIVER	0.453	0.461	0.451	0.449***
FISC	2.932***	2.986***	3.076***	3.162***
DISTCABMIL	-	-	-	-
shindig	0.538	0.534	0.534	0.540**

- Principales variables con efectos:
 - *Producción agrícola.
 - *Población.
 - *Superficie del municipio dedicada a agricultura.
 - *Extensión territorial del municipio.
 - *Porcentaje de PEA con secundaria o más.
 - *Porcentaje de establecimientos de la industria.
 - *Porcentaje del empleo en manufacturas
 - *Centros de capacitación técnica
 - *Impuestos/Egresos
 - *Distancia a centros urbanos



Employment

CHILE

Multiplicador de empleo de la industria agroalimentaria sobre el sector no transable

	(1) OLS	(2) OLS sin Santiago	(3) IV	(4) IV sin Santiago
Cambio empleo ind. agroalimentaria	-1.571** (0.608)	-2.323*** (0.362)	3.115 (8.023)	8.977 (39.441)
Cambio empleo resto sector transable	0.333** (0.149)	0.831** (0.329)	0.583 (0.451)	-0.254 (3.821)
Trend annual	SI	SI	SI	SI
Efectos territorios	SI	SI	SI	SI
Constant	7188.363*** (498.796)	3963.114*** (733.129)	6997.706*** (1008.720)	5141.506 (4473.815)
Observations	154	140	154	140
R^2	0.33	0.36	0.37	0.01

Standard errors in parentheses

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

CHILE

Multiplicador de empleo de la industria agroalimentaria sobre el resto del sector transable

	(1) OLS	(2) OLS sin Santiago	(3) OLS	(4) OLS sin Santiago
Cambio empleo ind. agroalimentaria	-1.533 (2.271)	0.858 ^{***} (0.219)		
Cambio empleo calificado ind agroalimentaria			-6.470 ^{***} (1.115)	0.983 (1.278)
Cambio empleo no calificado ind agroalimentaria			0.216 (0.790)	1.564 ^{**} (0.610)
Trend annual	SI	SI	SI	SI
Efectos territorios	SI	SI	SI	SI
Constant	205.143 (494.940)	1110.808 ^{***} (279.564)	200.545 (264.854)	846.521 ^{***} (234.989)
Observations	154	140	154	140
R^2	0.08	0.17	0.66	0.21

Standard errors in parentheses

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

Multiplicador de empleo de la industria agroalimentaria: desagregación por tamaño

CHILE

	(1) No Transable	(2) Agricultura	(3) Servicios	(4) Transable
Cambio empleo ind agroalimentaria grande	-1.934 (1.922)	-1.261* (0.737)	0.156 (1.344)	4.470*** (1.543)
Cambio empleo ind agroalimentaria mediana	0.099 (1.989)	0.106 (0.557)	1.192 (1.513)	-4.876*** (1.549)
Cambio empleo ind agroalimentaria pequeña	9.424*** (3.567)	2.344 (1.602)	2.429 (2.697)	-0.555 (3.494)
Cambio empleo ind agroalimentaria micro	-11.250 (7.852)	4.257** (1.956)	-10.162 (6.756)	2.625 (3.043)
Cambio empleo resto sector transable	0.549** (0.220)	0.587*** (0.080)	0.154 (0.199)	
Cambio empleo servicios		0.234** (0.095)		
Cambio empleo agricultura			0.610** (0.233)	
Trend annual	SI	SI	SI	SI
Efectos territorio	SI	SI	SI	SI
Constant	6185.582*** (359.639)	-1025.588* (534.896)	5455.181*** (308.744)	777.584** (363.354)
Observations	154	154	154	154
R ²	0.46	0.74	0.56	0.57

Standard errors in parentheses

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

Mexico



Variable dependiente: cambio en el empleo del sector no comerciable						
	OLS0	OLS1	OLS2	OLS3	IV1	IV2
Empleo en el sector no comerciable en 1998	0.34** (2.57)	0.35** (2.54)	0.35** (2.59)	0.32** (2.41)	0.37*** (3.41)	0.35*** (3.19)
Cambio en el empleo agroalimentario 1998-2008	1.91 (1.22)		1.10 (0.71)	1.09 (0.70)	2.85 (0.61)	2.19 (0.57)
Cambio en el empleo del resto del sector comerciable 1998-2008		0.55** (2.33)	0.51** (2.25)	0.43** (2.09)	2.36* (1.86)	2.18* (1.86)
Cambio en el número de hoteles 1998-2008				171.50** 2.64		132.48*** 2.66
Efectos estado	Sí	Sí	Sí	Sí	Sí	Sí
Intercepto	2402.14* 1.98	2521.99** 2.13	2386.94* 1.95	2353.17* 2.01	1707.52 1.45	1796.53 1.62
N	2455	2455	2455	2455	2385	2385
p	0.000	0.000	0.000	0.000	0.000	0.150
R ²	0.57	0.58	0.58	0.61	0.43	0.48

*Los estadísticos t aparecen entre paréntesis. Se utilizan clústeres a nivel entidad federativa para los errores estándar.

** Significativos al 1% ** Significativos al 5% * Significativos al 10%.

Fuente: Estimación propia con datos de Censos Económicos de 1999 y 2009.



Poverty elasticity

Poverty elasticity to growth in agri-processing in Chile

Elasticidad de la pobreza al crecimiento del PIB sectorial. Desagregacion parcial, PIB per capita rezagado. Heterogeneidad de los efectos en el territorio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	NACIONAL			URBANO			RURAL		
	FGT0	FGT1	FGT2	FGT0	FGT1	FGT2	FGT0	FGT1	FGT2
cambio en poblacion	2.230*** (0.848)	2.133*** (0.689)	2.212** (0.972)	2.063 (1.328)	1.916* (0.983)	2.072* (1.255)	1.278 (1.690)	2.940 (2.125)	3.376 (3.510)
agroindustria	1.951*** (0.298)	0.790** (0.400)	0.444 (0.534)	1.990*** (0.313)	0.615 (0.415)	0.135 (0.531)	2.274*** (0.495)	4.711*** (1.011)	7.291*** (2.012)
Agroindustria*CentroNorte	-1.927*** (0.269)	-0.740** (0.337)	-0.485 (0.436)	-2.006*** (0.272)	-0.541 (0.392)	-0.129 (0.485)	-1.920*** (0.511)	-4.346*** (0.998)	-6.854*** (1.831)
Agroindustria*CentroSur	-2.246*** (0.576)	-1.661** (0.794)	-1.866* (1.023)	-2.520*** (0.493)	-1.515** (0.663)	-1.438 (0.907)	-1.394 (1.282)	-4.660** (2.094)	-7.917** (3.184)
Agroindustria*Sur	-3.851*** (0.390)	-3.006** (1.531)	-2.970 (2.995)	-3.812*** (0.397)	-2.693* (1.582)	-2.428 (3.096)	-3.958*** (0.885)	-7.484*** (1.084)	-11.812*** (1.950)
Sectores intensivos de trabajo	-0.538** (0.254)	-0.657* (0.375)	-0.605 (0.452)	-0.458* (0.273)	-0.604 (0.372)	-0.595 (0.431)	-1.027 (0.757)	-0.944 (0.972)	-0.721 (1.382)
minera	0.171 (0.115)	0.242 (0.209)	0.339 (0.297)	0.169 (0.110)	0.258 (0.205)	0.363 (0.291)	0.515** (0.236)	0.715 (0.455)	1.246 (1.020)
servicios	0.774*** (0.236)	1.114*** (0.331)	1.168*** (0.409)	0.615** (0.252)	0.953*** (0.324)	1.042*** (0.396)	1.923** (0.900)	2.061** (0.995)	2.305** (1.144)
utilities	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
gasto publico	0.072 (0.045)	0.107** (0.053)	0.124** (0.060)	0.079 (0.049)	0.105* (0.055)	0.118* (0.061)	0.047 (0.163)	0.078 (0.185)	0.088 (0.194)
escolaridad 1990	-0.110*** (0.021)	-0.130*** (0.047)	-0.159** (0.067)	-0.133*** (0.027)	-0.145*** (0.045)	-0.160** (0.064)	-0.040 (0.068)	-0.131 (0.107)	-0.352 (0.245)
infraestructura 1990	0.002 (0.002)	0.001 (0.004)	0.002 (0.005)	0.002 (0.002)	0.000 (0.004)	0.000 (0.005)	-0.002 (0.005)	0.003 (0.009)	0.017 (0.019)
Constant	0.955*** (0.229)	1.209*** (0.423)	1.533** (0.612)	1.313*** (0.340)	1.522*** (0.466)	1.659*** (0.620)	-0.186 (0.772)	0.720 (1.070)	2.799 (2.213)
Observations	91	91	91	91	91	91	91	91	91

Standard errors in parentheses

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