On designing the perfect boat

Growth in the Canadian Urban System, 2001-2006

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Source: Warner Bros.

Gregory Wrona, http://www.photographersdirect.com/news/200807.asp

1- The neo-regionalist approach to innovation and growth

- Regions are the ‘nexus of untraded interdependencies’ (Storper)

- Innovation dynamics (linked to institutions, human capital, networks, collaborations) are principally local: the importance of proximity.

- There is a connection between local innovation and local growth (endogenous growth theory).

- Localities (cities) are conceived of as systems with their own internal innovation and growth dynamics, sometimes connected to others by pipelines but essentially with their own ‘buzz’.

2- A brief critique of this approach

- Has tended to ignore knowledge about growth dynamics derived from city systems analysis (Pred, 1973; Pred & Tornquist, 1972).

  -*Cities and regions are interconnected: thus what happens in one is connected with what happens elsewhere*

-Misapplies endogenous growth theory :

  -*Can one reasonably expect smaller cities – and even metropolitan areas – to generate their growth dynamics internally?*

-In particular:

  -*On what basis do we suppose that the employment and income benefits of innovation will be captured locally?*

3- Another way of understanding city growth

- City growth is partly attributable to :
  - local dynamics *(neo-regionalism, or building boats)*.
    - diversity, human capital, local institutions, local politics etc…
  - wider interdependencies with urban areas to which it is connected *(city-systems, i.e. wider weather patterns).*
    - regions, access to markets
  - global trends in the particular economic sectors which are found in the city *(a-spatial industrial trends, , i.e. wider weather patterns)*.
    - ressource booms, demand for automobiles, currency fluctuations
  - wider scale historic/political trends *(path-dependency, , i.e. wider weather patterns).*
    - e.g. opening up of west, NAFTA (North-South trade realignment)

4- An example of what this approach can tell us

- Simple (meteorological?) model applied to Canada, based upon work by myself and colleagues (Shearmur & Polèse, 2007; Shearmur et al, 2007)

- Growth is function of:
  - Local city size (proxy for agglomeration)
  - Location relative to markets (access to external agglomeration effects)
  - Location relative to metropolitan areas (centre/periphery)
  - Local specialisation (Jacobs v. MAR effects)
  - Local human capital
  - Industrial structure
  - Region (regional city-system effects and interdependencies)
  - Proximity to US border (US markets)
  - East-west dimension (historic drift to the west)

5- Model

- Model is run with all explanatory variables
- Outliers (observations which have strong individual effect on regression coefficients, based on Cook's d) are eliminated
- Independent variables are checked for multicollinearity (no collinearity problems, VIF is below 5)
- Backwards selection process is performed to eliminate variables that are not significant (stay=90%)

- Final model is checked.

6- Measures of growth

- Employment growth

- Earned income growth

7- Employment growth

Table 1. Outliers from model for employment growth

class1	region	p01	City	emp. growth	work ic growth	residual	standard residual	
C	ON	146950	Barrie	0.21	0.13	0.10	2.10	Less wage pressure
P	AL	86080	Lethbridge	0.12	0.20	-0.09	-1.88	
C	AL	11635	Okotoks	0.44	0.16	0.20	4.10	
P	AL	11440	Grand-Centre	0.10	0.22	-0.08	-1.69	
P	AL	58315	Grande-Prairie	0.26	0.37	0.11	2.30	
P	AL	42475	Fort-McMurray	0.26	0.40	0.14	2.90	
C	AL	10805	Wetaskiwin	0.09	0.36	-0.10	-2.12	Wage pressure
P	BC	15175	Prince-Rupert	-0.12	0.03	-0.12	-2.50	
P	BC	10210	Kitimat	-0.11	0.10	-0.10	-2.03	
P	BC	22900	Fort-St-John	0.18	0.25	0.16	3.30	
P	PR	21245	Whitehorse	0.10	0.17	0.07	1.43	
P	PR	16450	Yellowknife	0.14	0.24	0.10	2.12	
C	QC	8870	Ste-Sophie	0.26	0.21	0.08	1.70	
C	QC	8175	Prevost	0.26	0.23	0.10	2.10	
C	PR	9025	Steinbach	0.18	0.21	0.10	2.00	

Note: ON: Ontario; AL: Alberta; BC: British Columbia; QC: Quebec; PR: Prairies

C: within 100km of a large metro area; P: beyond 100km; ic: income; p01: population in 2001.

Table 2: Regression results, employment growth

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	12	0.26672	0.02223	14.05	<.0001
Error	175	0.27683	0.00158		
Corrected Total	187	0.54355			

Root MSE	0.0398	R-Square	0.4907
Mean growth	0.0767	Adj R-Sq	0.4558
Coeff Var	51.87		

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	VIF
Intercept	1	-0.119	0.03	-3.73	0.000	0.00
AT	1	-0.003	0.01	-0.26	0.797	1.68
ON	1	-0.033	0.01	-3.90	0.000	2.09
PR	1	-0.007	0.01	-0.48	0.629	1.63
AL	1	0.096	0.02	5.91	<.0001	1.42
BC	1	0.004	0.01	0.33	0.742	1.85
CL11	1	0.021	0.01	2.01	0.046	2.54
CL14	1	0.023	0.01	1.71	0.088	1.68
CL6	1	0.009	0.01	0.88	0.382	1.93
CL7	1	0.055	0.01	5.14	<.0001	2.48
CL8	1	0.047	0.02	2.79	0.006	1.40
reference: CL9						
lpt01_2	1	0.021	0.00	6.40	<.0001	2.22
sp01	1	-0.026	0.01	-2.39	0.02	1.33

Primary, 1st transform. and public services

High-tech manufact. and high-order services

Primary sectors

Retail, leisure construction and real estate

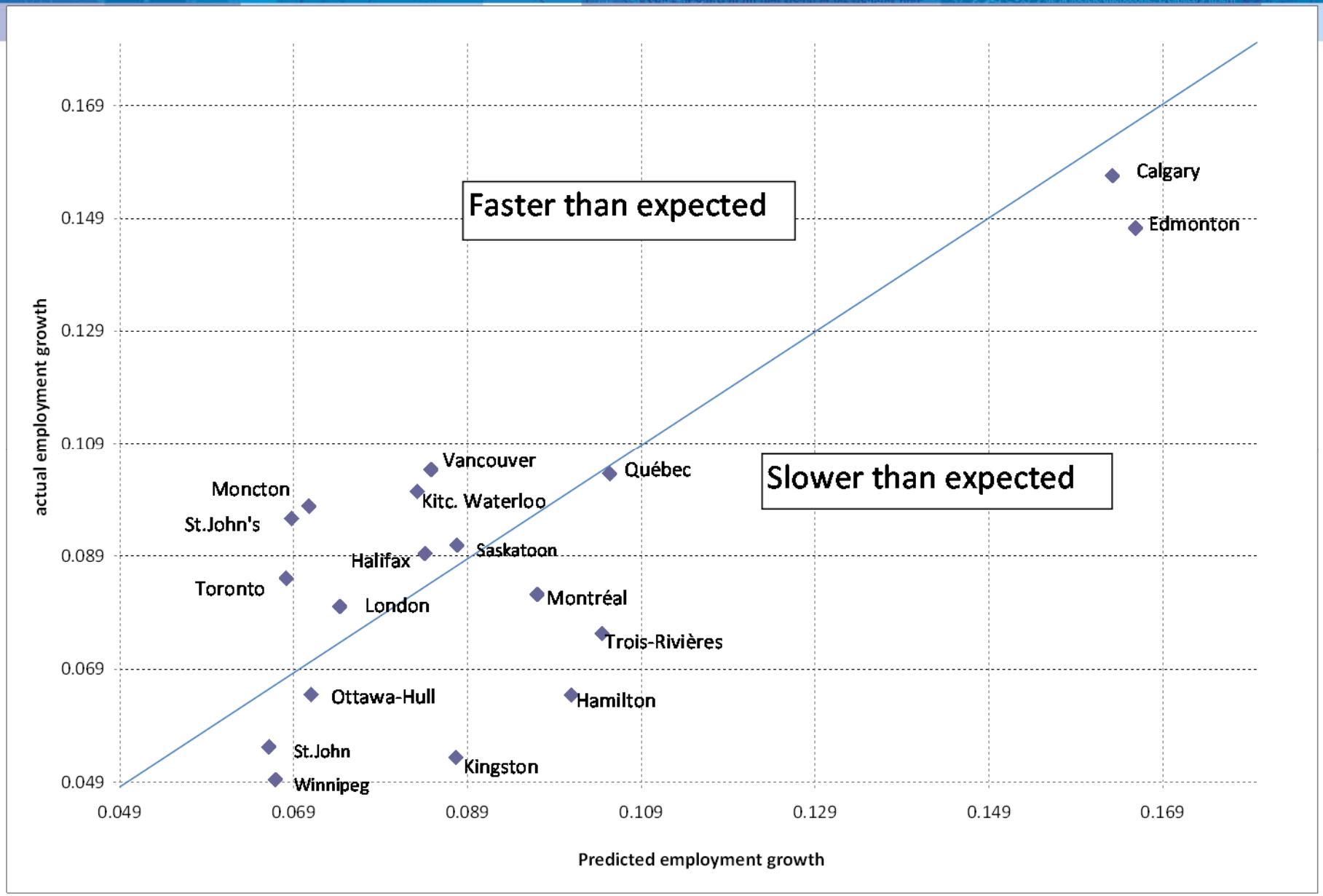
Public admin and information services

Manufacturing

GLM estimates, same model

Source	DF	Type II SS	Mean Square	F Value	Pr > F
region	5	0.13	0.03	16.35	<.0001
CLUSNAME	5	0.06	0.01	7.07	<.0001
lpt01_2	1	0.06	0.06	41.02	<.0001
sp01	1	0.01	0.01	5.69	0.02

Employment growth 2001-2006: actual v. predicted



8. Earned income growth

Table 3: Outliers from model for growth in work income

class1	region	p01	City	emp. growth	work ic growth	residual	standard residual
P	AT	171095	St-John's	0.10	0.19	0.08	1.41
P	AT	10455	Bay-Roberts	0.11	0.22	0.17	2.96
P	ON	14395	Petawa	0.07	0.21	0.09	1.59
C	AL	11635	Okotoks	0.44	0.16	-0.12	-2.08
C	AL	10725	Canmore	0.13	0.54	0.21	3.65
P	AL	11440	Grand-Centre	0.10	0.22	-0.08	-1.50
P	BC	24185	Quesnel	-0.04	0.26	0.16	2.67
P	BC	22900	Fort-St-John	0.18	0.25	0.13	2.24
C	ON	11960	Perth-east	-0.01	-0.10	-0.22	-3.65
C	ON	10010	Adjala-Tosorontio	0.09	0.34	0.20	3.41
C	ON	9000	Tiny	0.18	0.38	0.26	4.32
C	AL	7500	Strathmore	0.33	0.14	-0.14	-2.29

Table 4: Regression results, work income per worker

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	13	0.586	0.0451	20.49	<.0001
Error	177	0.390	0.0022		
Corrected Total	190	0.976			

Root MSE	0.047	R-Square	0.6008
Dependent Mean	0.127	Adj R-Sq	0.5715
Coeff Var	36.983		

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Variance Inflation
Intercept	1	0.008	0.031	0.25	0.805	0.00
AT	**1**	**0.033**	**0.017**	**1.98**	**0.049**	**2.00**
ON	1	-0.001	0.010	-0.13	0.895	2.11
PR	**1**	**0.115**	**0.020**	**5.91**	**<.0001**	**2.69**
AL	**1**	**0.235**	**0.021**	**11.08**	**<.0001**	**2.12**
BC	**1**	**0.033**	**0.019**	**1.67**	**0.096**	**3.73**
CL11	1	0.004	0.012	0.31	0.756	2.35
CL14	1	0.018	0.017	1.03	0.305	1.94
CL6	**1**	**0.036**	**0.012**	**3.1**	**0.002**	**1.97**
CL7	1	0.015	0.012	1.21	0.230	2.30
CL8	1	0.014	0.025	0.57	0.571	2.15
reference: CL9						
rlpt01_1	**1**	**0.107**	**0.032**	**3.36**	**0.001**	**3.38**
lpt01_2	**1**	**0.008**	**0.004**	**2.09**	**0.038**	**2.99**
pg_01	**1**	**0.252**	**0.128**	**1.97**	**0.050**	**2.14**

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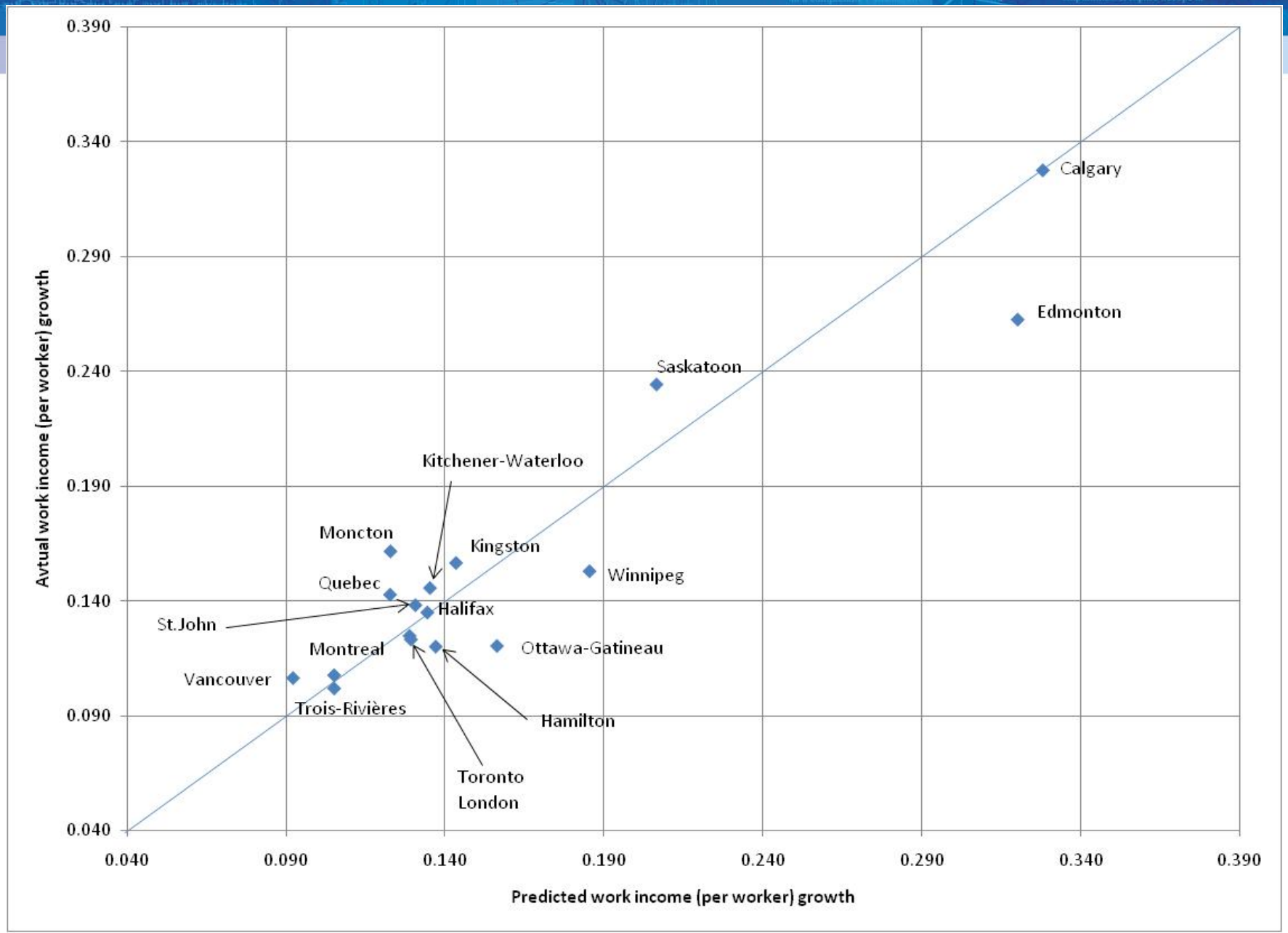
Manufacturing

GLM results for same model

Source	DF	Type II SS	Mean Square	F Value	Pr > F
reg	5	0.403785	0.080757	36.7	<.0001
CLUSNAME	5	0.025727	0.005145	2.34	0.0437
rlpt01_1	1	0.024807	0.024807	11.27	0.001
lpt01_2	1	0.009575	0.009575	4.35	0.0384
pg_01	1	0.008552	0.008552	3.89	0.0502

Growth in work income, 2001-2006: actual v. predicted



9. Conclusions

- These results can be dismissed out of hand:
  - The weatherman / woman always gets it wrong !
  - Naive positivism;
  - Vagueness of precise mechanisms at work;
  - They fail to integrate agency, institutions, local realities etc…;
  - They do not lend support to fashionable discourses such as ‘talent’, ‘territoriality’, ‘embeddeness’…
  - They rest upon (revisited) old theory (urban systems – especially Pred).

9-Conclusions

- Or one can engage with the results:
  - **What are the weather patterns and how do they (or don't they) affect my boat?**
  - Is the city region the correct scale at which to look for innovation systems?
  - To what extent do industrial clusters behave in a 'Porterian' way (localised dynamics) and to what extent do they reflect wider industrial trends (clusters as understood by Perroux(1949))?
  - Is it possible for the effects of local factors (such as human capital) to be captured locally, given the mobility of people, their involvement in non-local networks and multi-location companies?
  - Are innovation and local growth connected? Even if regional dynamics lead to innovation, does local innovation necessarily lead to local growth?

9. Conclusions

- At the ISRN we have learned how to build, crew and organise boats very well:
  - We have dissected how local city dynamics affect innovation from a governance, talent and industrial perspective.

- We still have little idea of what happens when the boats are put to sea.
  - We still do not really know to what extent and how this affects cities' overall growth trajectories;
  - We still do not know what ELSE affects cities' growth trajectories.

Selected bibliography (background to ideas expressed in this presentation):

- On the weak connection between local innovation and local growth:
  - Shearmur, R., 2010, *Like Oil and Water? Regional Innovation Policy and Regional Development Policy,* Montreal: INRS working paper, http://www.ucs.inrs.ca/pdf/inedit2010_02.pdf

- For the underpinnings of the growth model:
  - Shearmur, R., et M.Polèse, 2007, Do Local Factors Explain Local Employment Growth? : Evidence from Canada, 1971-2001, *Regional Studies*, 45.4, 453-471
  - Shearmur, R., P.Apparicio, P.Lizion and M.Polèse, 2007, Space, Time and Local Employment Growth: An Application of Spatial Regression Analysis, *Growth and Change*, 38.4, 697-722

- On neo-regionalism and spatial analysis:
  - Shearmur, R., 2010, Innovation, Regions and Proximity: from Neo-regionalism to Spatial Analysis, *Regional Studies* (forthcoming)
  - Shearmur, R., 2010, Space, Place and Innovation: a Distance Based Approach, *Canadian Geographer,* 54.1, 46-67