

Table 1: Spatial autocorrelation: Coefficients estimates by variable.

Variable	Point estimate	Avg. bias	Bias-corrected confidence interval				
			5%	16%	Median	84%	95%
Gross job creation (births)	0.08	0.05	0.06	0.09	0.13	0.16	0.19
Employment/Pop (log, BDS)	0.41	0.03	0.39	0.41	0.44	0.47	0.50
Pop growth	0.55	0.01	0.48	0.52	0.56	0.60	0.64
Wage growth	0.25	0.04	0.23	0.25	0.28	0.32	0.35
Firm entry rate	0.51	0.03	0.49	0.51	0.53	0.55	0.57
Firm exit rate	0.34	0.04	0.33	0.35	0.38	0.40	0.43
Net migration rate	0.76	-0.00	0.71	0.73	0.76	0.79	0.81
Firm exit rate (all)	0.54	0.03	0.54	0.55	0.57	0.59	0.61
Startup size	0.24	0.04	0.23	0.24	0.28	0.31	0.33
Bartik: Entrant's job creation	0.74	0.01	0.71	0.72	0.75	0.77	0.79
Bartik: Employment	0.55	0.02	0.52	0.54	0.57	0.61	0.64

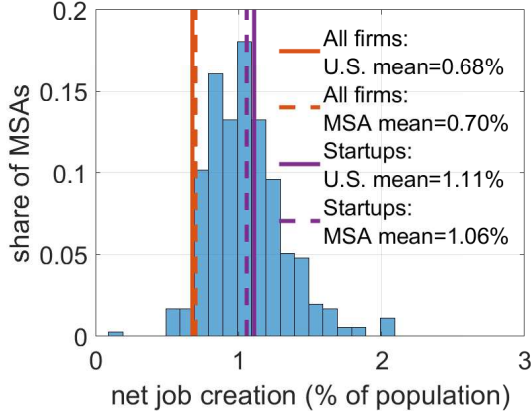
The table shows the point estimate and bias-corrected confidence interval for the spatial correlation coefficients ρ_s for all variables s . Prior to bias-correction, the estimated spatial correlation shows a small upward bias across all variables. House price data are from CoreLogic Solutions.

Table 2: First-stage F -statistics

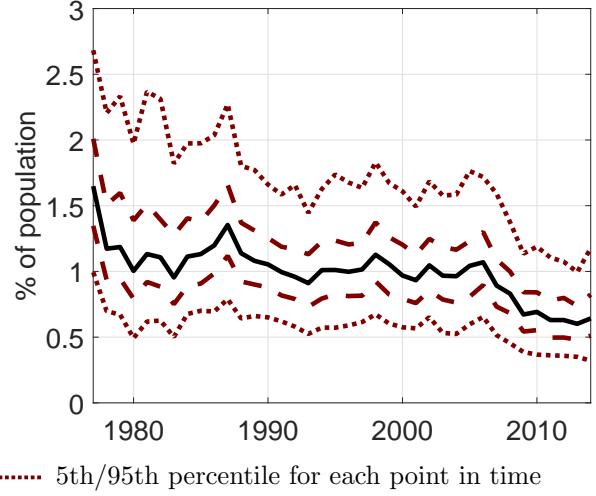
Variable	Point estimate	Confidence interval				
		5%	16%	Median	84%	95%
Gross job creation (births)	16.2	5.7	8.6	15.4	23.9	30.3
Employment/Pop (log, BDS)	84.3	34.4	47.1	73.7	99.4	114.1

The table reports the F -statistics of regressions of the identified structural shocks on the (spatially filtered) instruments with bootstrapped confidence intervals. The instruments in our baseline specification have F -statistics above 10 with a bootstrapped 90% confidence interval of (6.7, 26.0) and (34.3, 104.7), respectively.

(a) Average startup job creation across MSAs

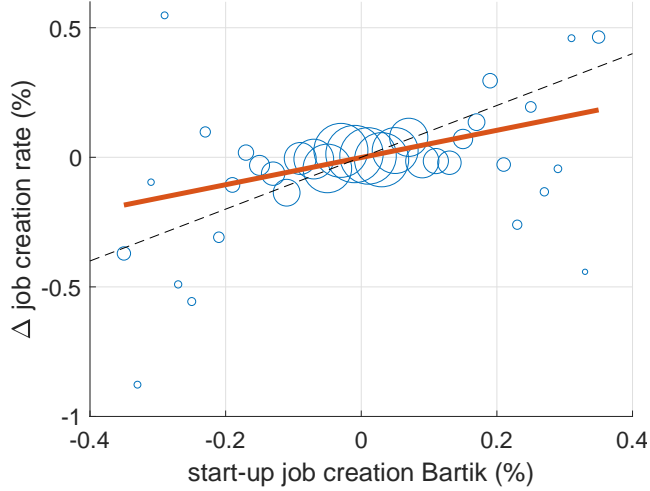
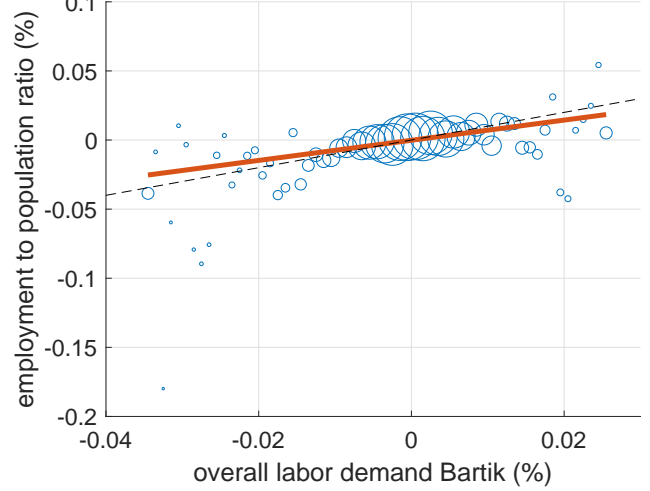


(b) Startup job creation across MSAs and over time



All job creation rates relative to population.

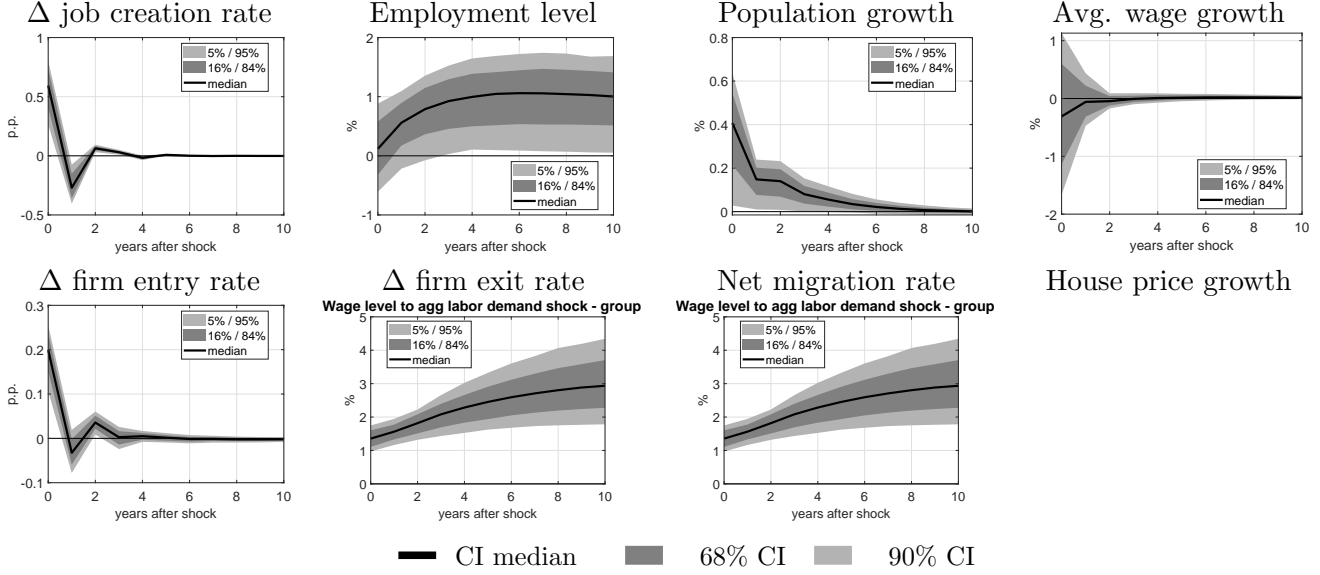
Figure 1: The distribution of startup job creation across MSAs and over time

(a) Startup Bartik
F-stat = 31.07(b) Overall labor demand Bartik
F-stat = 67.83

The figure shows binned scatter plots of the change in the startup job creation rate on the startup Bartik variable $Z_{m,t}^{N0}$ (panel (a)) and of the employment to population ratio on the overall labor demand Bartik variable $Z_{m,t}^N$ (panel (b)). We winsorize all four variables at the 0.5% and 99.5% levels and use deviations from time and MSA fixed effects. The observations are binned with the radius of the circles indicating the number of observations. The plot compares the (solid) regression line with the (dashed) 45-degree line. In the raw data, ?-type instruments for startup activity and overall labor demand have good predictive power.

Figure 2: Static reduced form first stage relationship

(a) Startup shock



Δ job creation rate refers to the job creation rate by startups. Panel (a) shows the response to the identified startup shock, along with bootstrapped confidence intervals. Panel (b) shows the corresponding response to the overall labor demand shock. The solid line is the median across the bootstrapped draws, while the shaded areas are the 68% and 90% confidence intervals, respectively. The underlying house price data are from CoreLogic Solutions – *omitted from public version*. Startup shocks have small but persistent effects on local employment, driven by population growth. Average wages do not rise. Overall labor demand shocks have only small effects on startup employment, but large initial effects on employment. Both shocks lead to more entry and exit.

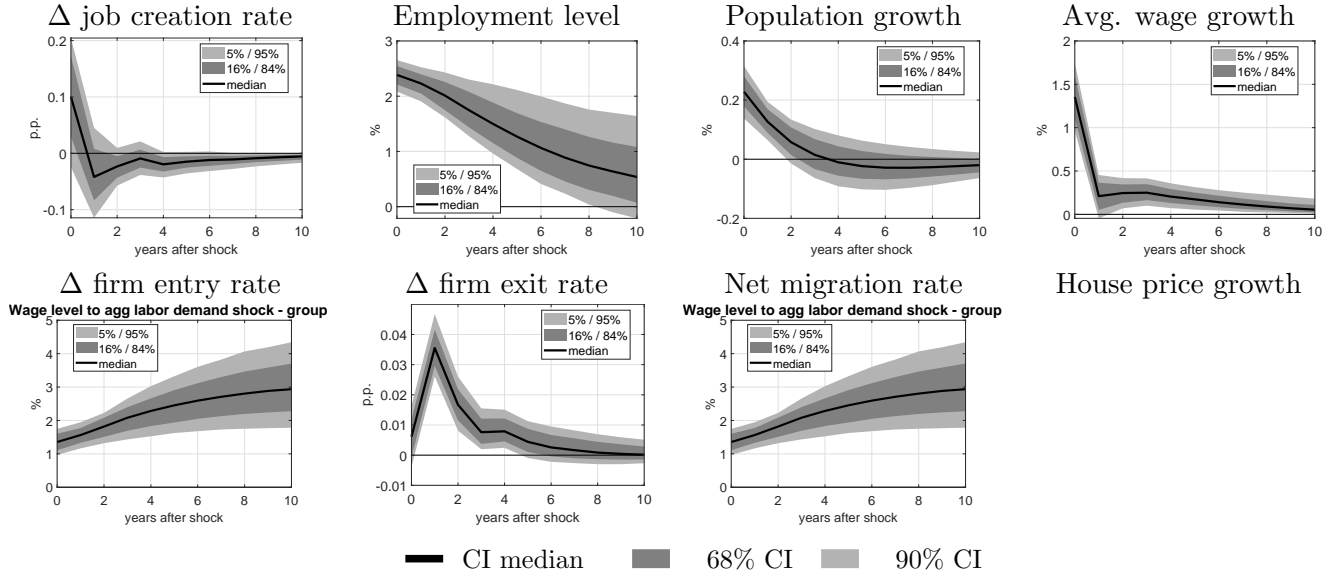
Figure 3: Impulse-responses to startup productivity shock and overall labor demand shock – baseline VAR.

Table 3: Variance decomposition in our baseline VAR. 68% confidence interval.

	10 year horizon							
	(1) Startup shock		(2) Overall labor demand		(3) Other VAR shocks		(4) Idiosyncratic shock	
Gross job creation (births)	50.7	(22.5, 79.9)	2.1	(0.4, 3.9)	47.2	(18.4, 76.2)	0.0	(0.0, 0.0)
Employment/Pop (log, BDS)	3.6	(1.1, 6.5)	75.4	(67.5, 83.1)	21.0	(13.6, 28.4)	0.0	(0.0, 0.0)
Pop growth	36.2	(10.8, 60.7)	11.9	(7.0, 16.8)	51.9	(26.8, 78.2)	0.0	(0.0, 0.0)
Wage growth	8.9	(0.8, 17.7)	20.9	(14.5, 27.5)	70.2	(57.6, 81.2)	0.0	(0.0, 0.0)
Firm entry rate	6.9	(4.3, 9.5)	2.6	(1.7, 3.6)	3.9	(1.7, 6.1)	86.6	(84.7, 88.3)
Firm exit rate	1.1	(0.6, 1.6)	1.7	(1.3, 2.0)	1.5	(0.9, 2.1)	95.7	(95.1, 96.3)
Net migration rate	14.3	(4.0, 24.1)	7.5	(4.7, 10.3)	21.9	(10.2, 33.9)	56.3	(50.1, 62.4)
Firm exit rate (all)	1.4	(0.3, 2.4)	3.5	(2.8, 4.3)	3.6	(2.0, 5.3)	91.4	(89.5, 93.3)
Startup size	39.1	(18.7, 59.5)	1.4	(0.2, 2.7)	32.7	(11.7, 53.1)	26.7	(25.1, 28.4)

The table shows the fraction of the forecast error variance accounted for by the shocks in the VAR and, for the variables in the periphery, by the “idiosyncratic shocks” that affect only the variable of interest. Startup shocks explain about half of the variation in the job creation rate by startups and about 40% of population growth. Overall labor demand shocks contribute little to the variation in the job creation rate by startups, but explain most of the variation in the employment-to-population ratio. Except for migration, the VAR shocks explain relatively little of the peripheral variables. But Table ?? shows that the results are similar when we include more variables in the core VAR. House price data are from CoreLogic Solutions.

(b) Overall labor demand shock



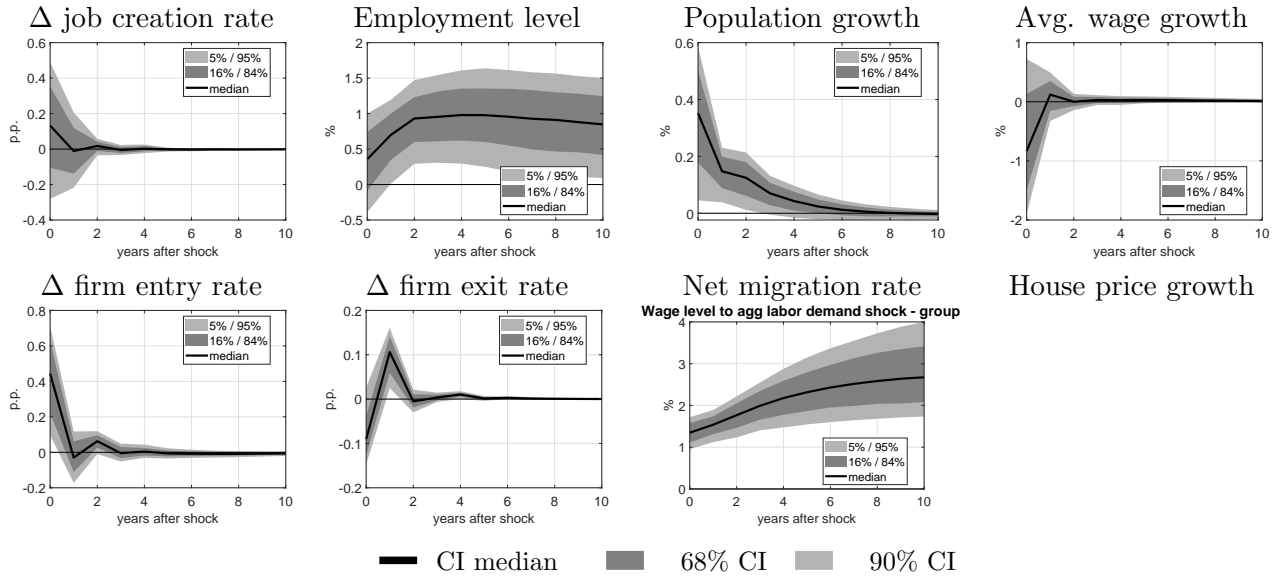
Δ job creation rate refers to the job creation rate by startups. Panel (a) shows the response to the identified startup shock, along with bootstrapped confidence intervals. Panel (b) shows the corresponding response to the overall labor demand shock. The solid line is the median across the bootstrapped draws, while the shaded areas are the 68% and 90% confidence intervals, respectively. The underlying house price data are from CoreLogic Solutions – *omitted from public version*. Startup shocks have small but persistent effects on local employment, driven by population growth. Average wages do not rise. Overall labor demand shocks have only small effects on startup employment, but large initial effects on employment. Both shocks lead to more entry and exit.

Figure 4: Impulse-responses to overall labor demand shock – baseline VAR.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VC growth	0.088*	0.554	0.547*	0.339*	0.041***	0.203***	0.180***	0.181***
	(1.92)	(1.62)	(2.04)	(1.87)	(5.08)	(3.41)	(3.35)	(3.27)
Lagged VC growth	0.044	0.190			0.022	0.079		
	(0.78)	(0.64)			(0.83)	(0.66)		
Constant	-0.030***	-0.396	-0.269**	-0.170*	-0.033***	-0.170**	-0.117***	-0.118***
	(-3.89)	(-1.34)	(-2.31)	(-1.89)	(-15.28)	(-2.37)	(-4.78)	(-4.31)
Observations	1295	1295	1726	1767	1283	1283	1707	1749
MSAs	164	164	209	250	163	163	208	250
Years	12	12	13	13	12	12	13	13
Transformation	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Weights	No	No	No	No	Yes	Yes	Yes	Yes

Table 4: VC regression

(a) Startup shock



Δ job creation rate refers to the job creation rate by startups. Panel (a) shows the response to the identified startup shock, along with bootstrapped confidence intervals. Panel (b) shows the corresponding response to the overall labor demand shock. The solid line is the median across the bootstrapped draws, while the shaded areas are the 68% and 90% confidence intervals, respectively. The underlying house price data are from CoreLogic Solutions – *omitted from public version*. Startup shocks have small but persistent effects on local employment, driven by population growth. Average wages do not rise. Overall labor demand shocks have only small effects on startup employment, but large initial effects on employment. Both shocks lead to more entry and exit.

Figure 5: Impulse-responses to startup barriers to entry shock – larger VAR.

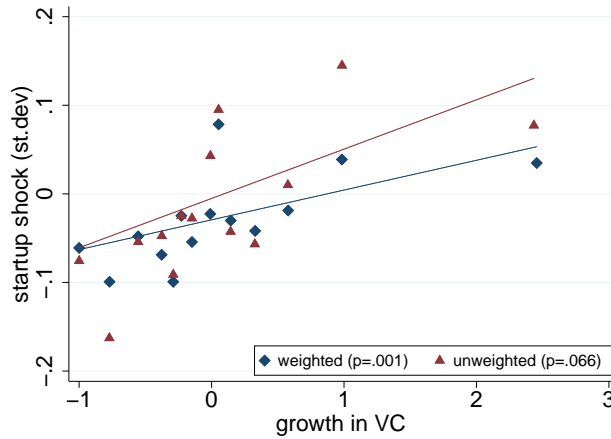
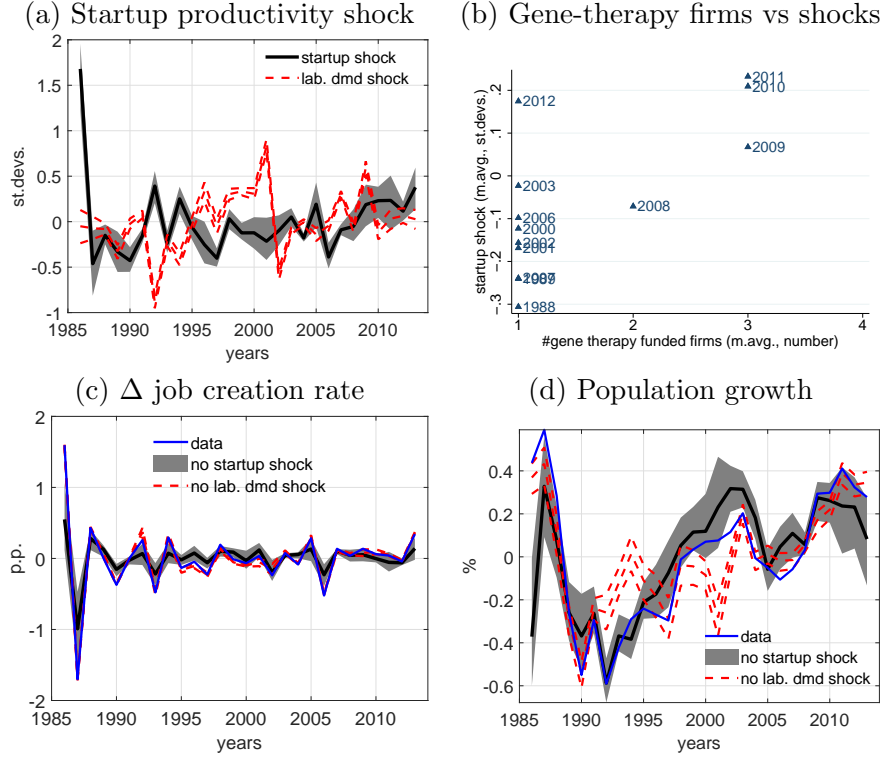


Figure 6: VC scatter plot



Panel (a) shows the median identified startup shock for the Philadelphia MSA with 68% confidence intervals (gray area) and the identified labor demand shock with 68% confidence intervals (red dashed lines). Panel (b) relates a 2-year moving average of the startup shocks to the number of gene therapy startups whenever a non-zero number is reported. Panels (c) and (d) report the data on startup job creation and population growth and the counterfactual with zero startup shocks (gray area) or zero labor demand shocks (red dashed lines), along with the 68% confidence interval.

Figure 7: Historical startup productivity shocks, shock correlations, and counterfactuals: Philadelphia, 1986–2013.