

Growth Expectations and the Dynamics of Firm Entry

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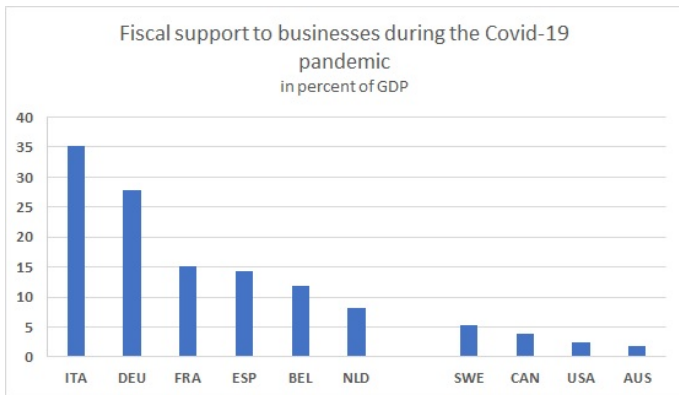
Growth, Productivity and macro modelling in the Americas

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Introduction

- ▶ Following the Covid-19 pandemic outbreak, governments around the world spent large amounts of money to shield their economies from the fall out of the crisis.
- ▶ Yet, the approach in continental Europe with widespread support to businesses contrasts with that of other countries.



Sources: Database of Country Fiscal Measures in Response to the COVID-19 Pandemic; and IMF staff estimates.

Introduction

- ▶ Question: how wise was such massive support?
 - ▶ One view: support policies should be relatively light and phased out swiftly, to let severely affected firms exit (see Freeman et al. 2021 or Hodbod et al. 2020).
 - ▶ Another view: Aggregate demand externalities can trigger adverse spirals (Gobbi et al. 2020). Firms going bust can lead to large contractions in demand, leading to additional waves of firm exits.
 - ▶ Assessing which view is more likely to hold requires a proper understanding of the dynamics of firm entry.
 - ▶ Firm entry is very responsive to past exit \Rightarrow first option with light support seems appropriate.
 - ▶ Firm entry needs specific conditions or support to thrive \Rightarrow second option seems more suitable.

Introduction

- ▶ To shed light on these questions, I run an empirical analysis of the dynamics of firm entry. The analysis is conducted at the sector level for the main Euro Area economies for the period 2009-2019.
- ▶ Two questions:
 - ▶ How (much) does entry depend on past entry and exit developments?
 - ▶ What economic conditions, which economic policies affect these lead-lag relationships?
- ▶ Two main exercises:
 - ▶ A simple model with 2 key ingredients: (i) risk-averse firms decide entry on the basis of *current and future* profits, (ii) stronger growth expectations raise *average* future profits and reduce their *volatility*.
 - ▶ Empirical analysis' 2 main results: (i) entry increases with past exits if strong *expected* growth (not if strong *current* growth), (ii) (public and private) investment contribution is the main driver.

Literature

The paper builds on the literature studying the two-way interaction between firm turnover and the business cycle.

- ▶ Do firm exits make room for new more productive firms? Cabellero and Hammour (1994), Johnson and Parker (1994), Pe'er and Vertinsky (2008)
- ▶ How much entry contributes to aggregate productivity? Clementi and Palazzo (2016), Asturias et al. (2022), Gourio et al. (2016)
- ▶ Which factors drive entry? Barlevy (2003), Campbell and Hopenhayn (2005), Aghion et al. (2007) or Osotimehin and Pappadà (2015)
- ▶ Recessions as periods of fewer and weaker new entrants: Sedlacek and Sterk (2017) and Moreira (2017)
- ▶ Role of entry in business cycle fluctuations through expectations of future profits: Bilbiie et al. (2012, 2015)

The model

- ▶ Consider an economy where output y_t consists of a continuum of sectoral goods $y_t(s)$.
- ▶ In each sector s , a measure n_{st} of firms produce differentiated varieties of the sectoral good s :
- ▶ Entry/exit decisions are made *before* the state of the economy is realised $\Rightarrow y_t(s)$ depends on $n_{s,t-1}$.

$$y_t = \left[\int_0^1 [\alpha_t(s)]^{\frac{1}{\sigma}} [y_t(s)]^{\frac{\sigma-1}{\sigma}} ds \right]^{\frac{\sigma}{\sigma-1}} \quad \text{and} \quad y_t(s) = \left[\int_0^{n_{st}-1} [y_{st}(i)]^{\frac{\theta-1}{\theta}} di \right]^{\frac{\theta}{\theta-1}}$$

- ▶ $\alpha_t(s)$: sectoral shifter, satisfying $\int_0^1 [\alpha_t(s)]^{\frac{1}{\sigma}} ds = 1$.
- ▶ General price level: $p_t = \left[\int_0^1 \alpha_t(s) [p_t(s)]^{1-\sigma} ds \right]^{\frac{1}{1-\sigma}}$
- ▶ Price level in sector s : $p_t(s) = \left[\int_0^{n_{st}-1} [p_{st}(i)]^{1-\theta} ds \right]^{\frac{1}{1-\theta}}$
- ▶ Price of the variety i of good s : $p_{st}(i)$

The model

- Profit of firm i operating in sector s and charging a price $p_{st}(i)$ writes as

$$\pi_{st}(i) = [p_{st}(i) - c] \left[\frac{p_t(s)}{p_t} \right]^{-\sigma} \left[\frac{p_{st}(i)}{p_{st}} \right]^{-\theta} \alpha_t(s) y_t$$

- Assuming $\theta > 1$, under optimal pricing, date- t profits in sector s write as:

$$\pi_{s,t+1} = \frac{c}{\theta - 1} \frac{1}{[n_{s,t}]^{\frac{\theta - \sigma}{\theta - 1}}} \frac{\alpha_{t+1}(s) y_{t+1}}{\left[\int_0^1 \alpha_{t+1}(i) [n_{i,t}]^{\frac{\sigma - 1}{\theta - 1}} di \right]^{\frac{\sigma}{\sigma - 1}}}$$

- Profits $\pi_{s,t+1}$ decreases with the measure n_{st} of firms whenever $\theta > \sigma$
- Firms decide to enter at date t in sector s if the expected utility of future profits net of the fixed cost of entry F_{st} is non-negative:

$$E[u(\pi_{s,t+1} - F_{st})] \geq 0$$

The model

I then make the following assumptions:

- ▶ The fixed cost of entry F_{st} decomposes into an ex ante and an ex post fixed cost:

$$F_{st} = F_{st}^a + F_{st+1}^p \quad \text{with} \quad F_{st}^i = f^i y_t - n_{st-1} \quad \text{and} \quad f^i \geq 0$$

- ▶ The fixed cost of entry depends *positively* on aggregate output and *negatively* on the number of firms in operation in the sector.
- ▶ New entrants know current aggregate output y_t , but only the distribution of future aggregate output y_{t+1} :

$$y_{t+1} = \beta y_t + g_{t+1} + \varepsilon_{t+1}$$

$$E_t y_{t+1} = \beta y_t + m_{t+1} \quad \text{and} \quad V_t y_{t+1} = \sigma_{t+1}^2$$

- ▶ Higher expectations of future output m_{t+1} are associated with lower volatility σ_{t+1} of future output: $\partial \sigma_{t+1}^2 / \partial m_{t+1} < 0$ scatter plots

The model

- ▶ Assume firms' preferences write as $U(x) = E[x] - \gamma\sqrt{V[x]}$, with γ a positive scalar
- ▶ Solving for the free entry condition $E[u(\pi_{s,t+1} - F_{st})] = 0$, the number of firms in sector s at date t satisfies:

$$\ln n_{st} = \frac{\theta - \sigma}{\theta - 1} \left[\ln \overline{\pi_{st+1}} - \ln \left[f^p + \frac{f^a y_t - n_{st-1} - n_{st}}{\beta y_t + m_{t+1} - \gamma \sigma_{t+1}} \right] \right]$$

- ▶ The equilibrium number of firms n_{st} operating in sector s at date t :
 - ▶ depends positively on the number of firms n_{st-1} already in operation.
 - ▶ but less so, when current output y_t and/or growth expectations m_{t+1} are stronger
 - ▶ Growth expectations matter more than current output for the sensitivity of current to past entry when $1 - \beta + \gamma \left[-\frac{\partial \sigma_{t+1}}{\partial m_{t+1}} \right] \geq \frac{f^a}{f^p}$

The data

We use data on from three main sources:

- ▶ Eurostat database on Business demography indicators
 - ▶ Firm entry, exit and active firms across sectors for main Euro Area countries
 - ▶ data on employment creation and destruction by entering and exiting firms, also available.
 - ▶ Sample covers 7 largest EA economies (AT, BE, DE, ES, FR, IT, NL)
 - ▶ Data is annual, covers 2009-2019, and all 2-digit sectors, but “Agriculture” and “Financial and Insurance Activities”.
- ▶ OECD EO and IMF WEO databases
 - ▶ I collect vintages to compute forecasts of main macro variables (GDP, consumption, investment, etc.).
- ▶ OECD SPIDER database:
 - ▶ country-level data on quality insolvency regimes, ability/difficulty for firms to obtain credit, and presence of barriers to entry.

Some descriptive statistics

Let us define gross entry and exit rates e_{ist} and x_{ist} as:

$$e_{ist} = \frac{E_{ist}}{N_{ist}} \text{ and } x_{ist} = \frac{X_{ist}}{N_{ist}}$$

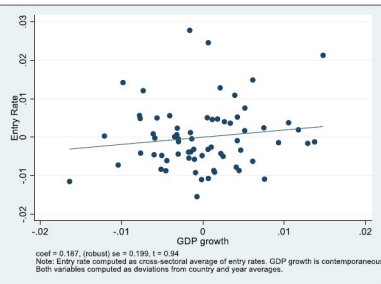
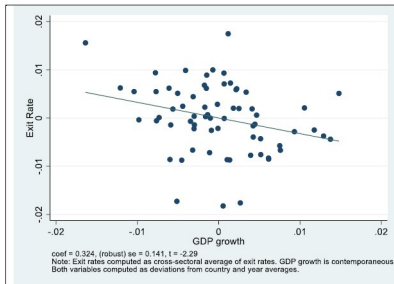
		Firm Entry as a ratio of the total number of firms					Firm Exit as the ratio of the total number of firms				
Country	Obs.	Average	Standard deviation	1 st quartile	Median	3 rd quartile	Average	Standard deviation	1 st quartile	Median	3 rd quartile
Austria	781	8.69%	3.82%	5.53%	8.39%	11.27%	7.43%	3.20%	4.96%	7.26%	9.47%
Belgium	424	3.49%	2.13%	2.10%	3.03%	4.20%	0.90%	0.51%	0.55%	0.82%	1.15%
Germany	494	7.12%	3.60%	4.16%	6.47%	9.57%	7.12%	2.66%	4.85%	7.01%	8.90%
Spain	760	9.30%	3.68%	6.71%	9.15%	11.74%	9.55%	3.19%	7.30%	9.36%	11.51%
France	637	10.66%	4.96%	7.05%	10.31%	13.49%	10.01%	4.28%	7.43%	9.85%	12.00%
Italy	778	9.16%	4.08%	6.21%	9.02%	11.44%	7.65%	2.75%	5.71%	7.35%	9.18%
Netherlands	789	10.05%	4.02%	7.45%	9.40%	11.90%	9.47%	2.86%	7.63%	9.06%	11.26%
Total sample	4663	8.73%	4.35%	5.36%	8.44%	11.37%	7.88%	3.92%	5.37%	7.98%	10.29%

Note: The table reports the summary statistics for gross firm entry and gross firm exit, expressed as ratios of the current number of active firms. The unit of observation is a sector-year for country-by-country summary statistics and a country-sector-year for the summary statistics for the total sample. Obs. Refers to the number of observations used to compute the summary statistics.

- ▶ On average, gross entry rate \geq gross exit rate
- ▶ Similar finding holds for medians in all countries, but Spain
- ▶ Dispersion in gross entry rates \geq dispersion in gross exit rates

The cyclical properties of entry and exit

- ▶ Let us consider the (simple) average entry and exit rates across sectors

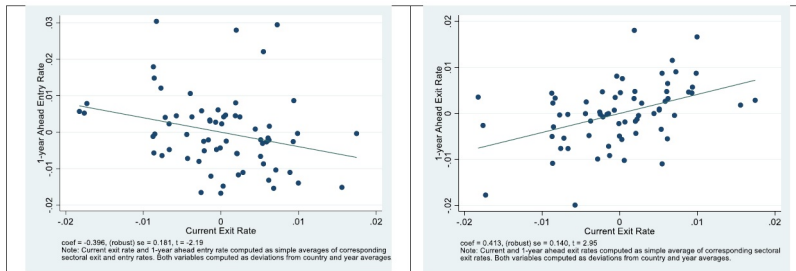


- ▶ Average exit rate is counter-cyclical, ie. high in low-growth periods and low in high-growth periods
- ▶ Average entry rate is only mildly pro-cyclical, correlation with GDP growth positive but insignificant

Leads and lags

Let us now look at lead-lag correlations.

- Do exits beget exit, or are more exits followed by more entry?



- More exits are followed by less entry and more exits after 1 year
- But there is no clear-cut pattern following more entry

The econometric specification

I use as dependent variables cumulative gross or net entry (net of exit):

$$c_{ist+h}^g = \frac{E_{ist+1} + \dots + E_{ist+h}}{N_{ist}}$$

or cumulative entry net of exit:

$$c_{ist+h}^n = \frac{E_{ist+1} - X_{ist+1} + \dots + E_{ist+h} - X_{ist+h}}{N_{ist}}$$

I then estimate a set of cross-country, cross-sector panel regressions as follows:

$$\ln \left(\frac{c_{ist+h}^g}{1 - c_{ist+h}^g} \right) = \beta_e^{(h)} \ln \left(\frac{e_{ist}}{1 - e_{ist}} \right) + \beta_x^{(h)} \ln \left(\frac{x_{ist}}{1 - x_{ist}} \right) + \Lambda^{(h)} + \varepsilon_{ist}^{(h)}$$

or

$$\ln \left(\frac{1 + c_{ist+h}^n}{1 - c_{ist+h}^n} \right) = \beta_e^{(h)} \ln \left(\frac{e_{ist}}{1 - e_{ist}} \right) + \beta_x^{(h)} \ln \left(\frac{x_{ist}}{1 - x_{ist}} \right) + \Lambda^{(h)} + \varepsilon_{ist}^{(h)}$$

Results from the baseline regressions

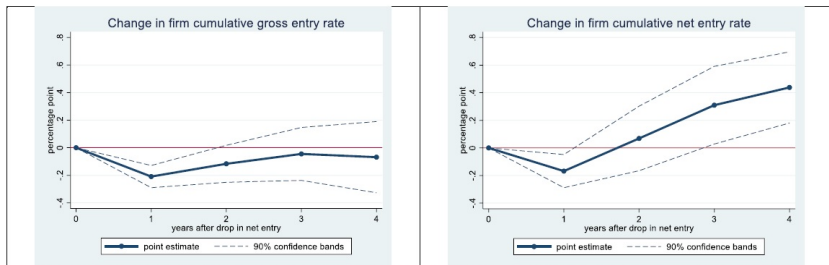
- ▶ Gross firm entry displays significant time persistence
- ▶ Exits do not seem to affect the forward path of *gross* entry.

Dependent variable	Subsequent Cumulative Firm Gross Entry				Subsequent Cumulative Firm Net Entry			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Firm Entry	17.87^a (3.635)	8.645^b (3.377)	5.747 (4.125)	5.078 (5.499)	2.956^a (0.783)	1.044 (1.647)	-1.413 (1.951)	-3.836^b (1.689)
Firm Exit	-2.981 (2.883)	2.122 (2.764)	3.695 (3.174)	2.614 (3.568)	0.325 (0.781)	2.005^c (1.152)	3.284^b (1.467)	2.948^c (1.517)
Observations	4,663	4,096	3,530	2,954	4,627	4,049	3,484	2,914
R-squared	0.919	0.945	0.951	0.953	0.637	0.745	0.824	0.887

Note: The table reports the estimation results from regressions where the dependent variable, reported on the first row, is the logistic transformation of either cumulative firm gross entry (four first columns) or cumulative firm entry net of exits (four last columns) between year $y+1$ and year $y+h$, taken as a ratio of the overall number of firms in year y . The second row reports the horizon h at which the dependent variable is computed. The independent variables are the logistic transformation of firm entry and firm exit in year y , both taken as a ratio of the overall number of firms in year y . Reported coefficients are all in percent. All estimations include the full set of country-sector, country-time, and sector-time fixed effects. Robust standard errors reported in parentheses. ^{a/b/c} indicate statistical significance at the 1%/5%/10% level.

The dynamic impact of entry and exit

- ▶ How does entry behave a one percentage point drop in entry rate and a one percentage increase in exit?



Note: The blue line in the left-hand panel (in the right-hand panel) represents the change in percentage point in the cumulative gross entry rate (cumulative net entry rate) following a one percentage point increase in the gross exit rate and one percentage decrease in the gross entry rate. The change is estimated based on coefficients reported in Table 2 and expressions (5) for marginal effects. Dashed lines represent in each panel the corresponding 90% confidence interval.

- ▶ Both gross and net entry fall significantly after one year
- ▶ Still, the fall in entry is small (roughly 10% of the combined impulse in entry and exit), and impact fades away after one year.

Exploring sector, country and time differences

- ▶ Previous estimates likely to hide large differences across sectors, countries and time.
- ▶ To explore these differences, I re-estimate the baseline specifications, allowing coefficients $\beta_e^{(h)}$ and $\beta_x^{(h)}$ to differ between across sectors.

Dependent variable	Subsequent Cumulative Firm Gross Entry				Subsequent Cumulative Firm Net Entry			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Yearly horizon								
Firm Entry industry	14.69^a (4.970)	4.035 (4.292)	2.437 (3.953)	4.921 (4.038)	0.869 (0.798)	0.751 (1.309)	0.841 (1.626)	-1.109 (1.669)
Firm Entry services	19.20^a (4.232)	10.35^a (3.988)	7.199 (5.227)	4.454 (7.377)	3.825^a (0.945)	1.031 (2.085)	-2.483 (2.394)	-5.397^a (2.085)
Firm Exit industry	-5.006 (5.032)	-3.896 (3.516)	0.181 (3.034)	-3.297 (3.697)	-0.490 (0.682)	0.365 (0.938)	1.383 (1.315)	-0.329 (1.420)
Firm Exit services	-2.343 (3.242)	4.918 (3.449)	5.550 (4.228)	6.019 (4.645)	0.544 (0.969)	2.772^c (1.510)	4.189^b (1.904)	4.503^b (1.938)
Observations	4,663	4,096	3,530	2,954	4,627	4,049	3,484	2,914
R-squared	0.919	0.945	0.951	0.953	0.639	0.745	0.824	0.888

Note: The table reports the estimation results from regressions where the dependent variable, reported on the first row, is the logistic transformation of either cumulative firm gross entry (four first columns) or cumulative firm entry net of exits (four last columns) between year $y+1$ and year $y+h$, taken as a ratio of the overall number of firms in year y . The second row reports the horizon h at which the dependent variable is computed. The independent variables are the logistic transformations of firm entry and firm exit in year y , both taken as a ratio of the overall number of firms in year y . Reported coefficients are all in percent. Each regression estimates separate coefficients for industry and service sectors. Industry sectors group sectors in Mining, Manufacturing, Utilities or Construction. Service sectors gather the other sectors. All estimations include the full set of country-sector, country-time, and sector-time fixed effects. Robust standard errors reported in parentheses. ^{a/b/c} indicate statistical significance at the 1%/5%/10% level.

- ▶ Entry is more persistent in services than in industry
- ▶ Exits weighs more on subsequent entry in industry than in services

Exploring sector, country and time differences

- Here, I re-estimate the baseline specifications, separating the period up to 2013 —GFC and EA SDC— from the period 2014 onwards.

Dependent variable	Subsequent Cumulative Firm Gross Entry				Subsequent Cumulative Firm Net Entry			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Yearly horizon								
Firm Entry up to 2013	29.49^a (4.356)	24.01^a (4.238)	21.91^a (5.359)	24.37^a (7.063)	3.676^a (0.970)	3.606 (2.393)	2.091 (2.764)	0.429 (2.169)
Firm Entry after 2013	11.85^a (4.229)	-0.061 (3.743)	-4.875 (4.348)	-5.978 (5.726)	2.664^a (0.873)	-0.493 (1.553)	-4.084^b (1.861)	-7.189^a (1.890)
Firm Exit up to 2013	-5.774 (3.886)	-5.088 (3.761)	-4.756 (4.257)	-6.208 (4.294)	1.289 (1.194)	1.212 (1.530)	-0.076 (1.765)	-1.193 (1.753)
Firm Exit after 2013	-1.683 (3.410)	4.382 (3.092)	6.804^c (3.529)	6.507 (4.446)	-0.333 (0.771)	2.221 (1.394)	5.128^a (1.835)	6.231^a (1.916)
Observations	4,663	4,096	3,530	2,954	4,627	4,049	3,484	2,914
R-squared	0.919	0.945	0.951	0.953	0.639	0.745	0.824	0.888

Note: The table reports the estimation results from regressions where the dependent variable, reported on the first row, is the logistic transformation of either cumulative firm gross entry (four first columns) or cumulative firm entry net of exits (four last columns) between year $y+1$ and year $y+h$, taken as a ratio of the overall number of firms in year y . The second row reports the horizon h at which the dependent variable is computed. The independent variables are the logistic transformations of firm entry and firm exit in year y , both taken as a ratio of the overall number of firms in year y . Reported coefficients are all in percent. Each regression estimates separate coefficients for the periods up to 2013, and after 2013. All estimations include the full set of country-sector, country-time and sector-time fixed effects. Robust standard errors reported in parentheses. ^a/^b/^c indicate statistical significance at the 1%/5%/10% level.

- Up to 2013, entry displays strong persistence, and correlation with exit always negative
- After 2013, persistence drops and correlation with exit turns positive

Exploring sector, country and time differences

- Here, I re-estimate the baseline specifications, separating core (AT,BE,DE,FR,NL) and periphery countries (ES and IT).

Dependent variable	Subsequent Cumulative Firm Gross Entry				Subsequent Cumulative Firm Net Entry			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Yearly horizon								
Firm Entry core	13.86 ^a (4.108)	6.104 ^c (3.698)	4.980 (4.527)	6.813 (6.350)	2.033 ^b (0.871)	-0.477 (2.241)	-2.210 (1.838)	-2.817 (1.838)
Firm Entry periphery	30.30 ^a (6.718)	14.51 ^b (6.417)	6.793 (7.673)	-2.349 (8.930)	5.676 ^a (1.573)	5.572 ^b (2.624)	0.852 (3.169)	-7.227 ^b (3.591)
Firm Exit core	1.454 (3.086)	8.130 ^a (2.915)	10.38 ^a (3.345)	7.348 ^c (4.043)	1.349 (0.842)	4.174 ^a (1.276)	5.754 ^a (1.614)	4.688 ^a (1.649)
Firm Exit periphery	-25.27 ^a (6.565)	-26.14 ^a (6.163)	-27.16 ^a (7.590)	-17.44 ^b (8.171)	-4.656 ^a (1.532)	-7.172 ^a (2.327)	-7.056 ^b (2.834)	-3.287 (3.254)
Observations	4,663	4,096	3,530	2,954	4,627	4,049	3,484	2,914
R-squared	0.920	0.946	0.952	0.953	0.642	0.750	0.827	0.888

Note: The table reports the estimation results from regressions where the dependent variable, reported on the first row, is the logistic transformation of either cumulative firm gross entry (four first columns) or cumulative firm entry net of exits (four last columns) between year $y+1$ and year $y+h$, taken as a ratio of the overall number of firms in year y . The second row reports the horizon h at which the dependent variable is computed. The independent variables are the logistic transformations of firm entry and firm exit in year y , both taken as a ratio of the overall number of firms in year y . Reported coefficients are all in percent. Each regression estimates separate coefficients for countries in the core (AT,BE,DE,FR,NL), and countries in the periphery (ES,IT). All estimations include the full set of country-sector, country-time and sector-time fixed effects. Robust standard errors reported in parentheses. ^a/^b/^c indicate statistical significance at the 1%/5%/10% level.

- Entry is 2 to 3 times more persistent in the periphery
- More exits are followed by more entry in the core, but less entry in the periphery

The role of growth forecasts

- ▶ I extend the specifications to include interactions of current entry and exit rates and measures of expected future economic conditions.

$$\ln \left[\frac{c_{ist+h}^g}{1 - c_{ist+h}^g} \right] = \left[\beta_{e0}^{(h)} + \beta_{e1}^{(h)} E_t g_{it+j} \right] \ln \left[\frac{e_{ist}}{1 - e_{ist}} \right] + \left[\beta_{x0}^{(h)} + \beta_{x1}^{(h)} E_t g_{it+j} \right] \ln \left[\frac{x_{ist}}{1 - x_{ist}} \right] + \Lambda^{(h)}$$

$$\ln \left[\frac{1 + c_{ist+h}^n}{1 - c_{ist+h}^n} \right] = \left[\beta_{e0}^{(h)} + \beta_{e1}^{(h)} E_t g_{it+j} \right] \ln \left[\frac{e_{ist}}{1 - e_{ist}} \right] + \left[\beta_{x0}^{(h)} + \beta_{x1}^{(h)} E_t g_{it+j} \right] \ln \left[\frac{x_{ist}}{1 - x_{ist}} \right] + \Lambda^{(h)}$$

- ▶ $E_t g_{it+j}$ GDP growth forecast in country i between $t + j - 1$ and $t + j$, conditional on the information set available in year t ,
 - ▶ $j = 0$: GDP growth real-time assessment
 - ▶ $j = 1$: 1-year ahead GDP growth forecast
 - ▶ $j = 2$: 1- to 2-year ahead GDP growth forecast
- ▶ Growth numbers from OECD economic outlook and the IMF World Economic Outlook databases.

Forecasts and realisations: some summary statistics

GDP growth	Summary statistics					Correlation matrix			
	Average	Standard deviation	1 st quartile	Median	3 rd quartile	Real-time	1-year	1-to 2-year	Final
Real-time estimate	0.76%	1.89%	0.19%	1.23%	1.74%	1	0.555	0.327	0.967
1-year ahead forecast	1.20%	0.83%	0.64%	1.32%	1.66%		1	0.751	0.542
1-to 2-year ahead forecast	1.59%	0.45%	1.36%	1.62%	1.90%			1	0.319
Final estimate	0.87%	2.02%	0.46%	1.38%	2.09%				1

Note: The first column in Table 6 reports different GDP growth variables. Real-time estimates correspond to GDP growth estimates for year t reported in the OECD Economic Outlook published in December of year t. 1-year ahead forecasts correspond to GDP growth for year t reported in the OECD Economic Outlook published in December of year t-1. 1-to 2-year ahead forecast correspond to GDP growth for year t reported in the OECD Economic Outlook published in December of year t-2. Final estimates correspond to GDP growth estimates reported in the OECD Economic Outlook published in December of year 2021.

GDP growth	Summary statistics					Correlation matrix			
	Average	Standard deviation	1 st quartile	Median	3 rd quartile	Real-time	1-year	1-to 2-year	Final
Real-time estimate	0.72%	1.90%	0.19%	1.25%	1.69%	1	0.797	0.543	0.962
1-year ahead forecast	1.24%	0.74%	0.90%	1.40%	1.65%		1	0.706	0.779
1-to 2-year ahead forecast	1.48%	0.39%	1.34%	1.53%	1.76%			1	0.523
Final estimate	0.86%	2.02%	0.43%	1.38%	2.08%				1

Note: The first column in Table 7 reports different GDP growth variables. Real-time estimates correspond to GDP growth estimates for year t reported in the IMF World Economic Outlook published in October of year t. 1-year ahead forecasts correspond to GDP growth for year t reported in the IMF World Economic Outlook published in October of year t-1. 1-to 2-year ahead forecast correspond to GDP growth for year t reported in the IMF World Economic Outlook published in October of year t-2. Final estimates correspond to GDP growth estimates reported in the IMF World Economic Outlook published in October of year 2021.

- ▶ distributions of GDP growth, real-time and final estimates very close.
- ▶ GDP growth forecasts more optimistic and less dispersed than real-time and final estimates
- ▶ Correlations btw forecasts and realisations rather low, especially at longer horizons

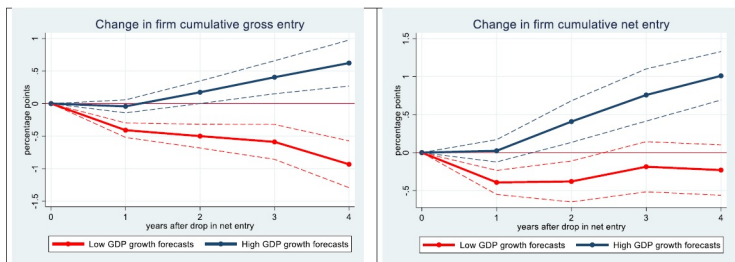
The empirical results

Dependent variable	Subsequent Cumulative Firm Gross Entry				Subsequent Cumulative Firm Net Entry			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Yearly horizon								
Firm Entry	44.47^a (5.674)	37.82^a (5.355)	35.82^a (6.860)	42.78^a (8.188)	5.997^a (1.249)	6.919^a (2.129)	4.542^c (2.713)	5.186^c (2.792)
Firm Entry × GDP growth forecast	-16.84^a (3.086)	-17.87^a (2.880)	-18.39^a (3.583)	-23.86^a (4.303)	-1.963^a (0.673)	-3.647^a (0.948)	-3.737^a (1.308)	-5.959^a (1.470)
Firm Exit	-24.38^b (7.844)	-17.27^b (7.031)	-20.61^a (7.924)	-26.89^a (8.648)	-4.938^a (1.554)	-8.106^a (2.537)	-9.693^a (3.345)	-11.96^a (3.266)
Firm Exit × GDP growth forecast	13.91^a (4.452)	11.91^a (3.967)	14.77^a (4.334)	18.20^a (5.150)	3.382^a (0.890)	6.153^a (1.387)	7.896^a (1.757)	9.228^a (1.790)
Observations	4,663	4,096	3,530	2,954	4,627	4,049	3,484	2,914
R-squared	0.920	0.946	0.951	0.954	0.640	0.748	0.826	0.889

Note: The table reports the estimation results from regressions where the dependent variable, reported on the first row, is the logistic transformation of either cumulative firm gross entry (four first columns) or cumulative firm entry net of exits (four last columns) between year $y+1$ and year $y+h$, taken as a ratio of the overall number of firms in year y . The second row reports the horizon h at which the dependent variable is computed. The independent variables are the logistic transformations of firm entry and firm exit in year y , both taken as a ratio of the overall number of firms in year y , and their respective interactions with 1- to 2-year ahead GDP growth OECD forecasts. Reported coefficients are all in percent. All estimations include the full set of country-sector, country-time and sector-time fixed effects. Robust standard errors reported in parentheses. ^a/^b/^c indicate statistical significance at the 1%/5%/10% level.

- ▶ Higher growth forecasts reduce the persistence of entry:
 - ▶ a one pp cut in entry reduces entry after 2 years by 0.7 pp with flat growth forecasts, but no impact if growth forecast about 2%.
- ▶ Higher growth forecasts turn the correlation between exit and subsequent entry from negative to positive
 - ▶ Turning point for growth forecasts: 1.4–1.65%

The empirical results



Note: The blue line (red line) in the left-hand panel represents the change in percentage point in the cumulative gross entry rate following a one percentage point increase in the gross exit rate and one percentage decrease in the gross entry rate when the 1- to 2-year ahead GDP growth forecast is at the 90th percentile of the sample distribution (at the 10th percentile of the sample distribution), based on OECD forecasts. The blue line (red line) in the right-hand panel represents the change in percentage point in the cumulative net entry rate following a one percentage point increase in the gross exit rate and one percentage decrease in the gross entry rate when the 1- to 2-year GDP growth forecast is at the 90th percentile of the sample (at the 10th percentile of the sample). Changes are estimated based on coefficients reported in Table 8. Dashed lines represent in each panel the corresponding 90% confidence interval.

- ▶ In the short-run,
 - ▶ With low growth forecasts, entry falls significantly following higher exit and lower entry. But with high growth forecasts, entry is flat.
- ▶ After two years,
 - ▶ Weak growth forecasts are followed by significantly lower entry, while strong growth forecasts associated with significantly higher entry
- ▶ Eventually, after four years,
 - ▶ difference in cumulative entry between the high and low growth scenarios amounts to about 1 to 1.5 pp

Some robustness checks

- Do growth forecasts capture the outlook or current conditions?

Dependent variable	Subsequent Cumulative Firm Gross Entry				Subsequent Cumulative Firm Net Entry			
	(1) (2)		(1) (2)		(1) (2)		(1) (2)	
	OECD		IMF		OECD		IMF	
Yearly horizon								
Forecast provider								
Firm Entry	40.39^a (6.184)	30.57^a (5.568)	41.39^a (6.715)	32.85^a (6.198)	5.770^a (1.351)	6.186^a (2.063)	7.017^a (1.404)	7.873^a (2.327)
Firm Entry × GDP growth forecast	-13.14^a (3.591)	-11.92^a (3.105)	-14.34^a (4.242)	-14.46^a (4.179)	-1.732^b (0.781)	-3.058^b (1.321)	-2.624^a (0.962)	-4.369^b (2.161)
Firm Entry × current GDP growth	-2.496^c (1.351)	-3.830^a (1.046)	-2.239^c (1.271)	-3.424^a (1.116)	-0.200 (0.249)	-0.367 (0.577)	-0.073 (0.264)	-0.210 (0.638)
Firm Exit	-23.07^a (7.918)	-13.80^b (7.040)	-24.81^a (9.356)	-13.00 (7.917)	-4.717^a (1.552)	-7.847^a (2.686)	-6.401^a (1.718)	-10.42^a (3.393)
Firm Exit × GDP growth forecast	13.01^a (4.805)	8.897^b (4.101)	14.57^b (6.086)	9.211^c (5.554)	2.976^a (0.879)	5.984^a (1.591)	4.300^a (1.268)	8.406^a (2.583)
Firm Exit × current GDP growth	0.039 (1.403)	1.582 (1.136)	-0.428 (1.458)	1.430 (1.245)	0.412 (0.315)	0.0209 (0.557)	0.101 (0.356)	-0.474 (0.643)
Observations	4,663	4,096	4,663	4,096	4,627	4,049	4,627	4,049
R-squared	0.920	0.946	0.920	0.946	0.640	0.748	0.639	0.746

Note: The table reports the estimation results from regressions where the dependent variable, reported on the first row, is the logistic transformation of either cumulative firm gross entry (four first columns) or cumulative firm entry net of exits (four last columns) between year $y+1$ and year $y+h$, taken as a ratio of the overall number of firms in year y . The second row reports the horizon h at which the dependent variable is computed. The independent variables are the logistic transformations of firm entry and firm exit in year y , both taken as a ratio of the overall number of firms in year y , and their respective interactions with current or 1- to 2-year ahead GDP growth forecasts. Reported coefficients are all in percent. The third row indicates whether GDP growth forecasts are drawn from the OECD EO or from the IMF WEO. All estimations include the full set of country-sector, country-time, and sector-time fixed effects. Robust standard errors reported in parentheses. ^{a/b/c} indicate statistical significance at the 1%/5%/10% level.

- Current conditions do affect entry persistence, but have no impact on the sensitivity of entry to past exit

Some robustness checks

- What is the role of insolvency frameworks in the dynamics of firm entry?

Dependent variable	2-year ahead Cumulative Firm Gross Entry				2-year ahead Cumulative Firm Net Entry			
Insolvency indicator	Cost of insolvency	Recovery rate	Creditor Participation	Time to recover credit	Cost of insolvency	Recovery rate	Creditor Participation	Time to recover credit
Firm Entry	29.95^a (7.575)	67.11^a (13.68)	95.03^a (26.28)	41.49^a (14.27)	5.213^c (2.713)	11.58 (9.836)	14.01 (14.26)	5.279 (7.631)
Firm Entry × GDP growth forecast	-16.83^a (2.854)	-18.10^a (2.786)	-17.84^a (2.844)	-17.45^a (2.860)	-2.418^b (0.956)	-2.997^a (0.940)	-2.988^a (0.975)	-3.219^a (0.987)
Firm Entry × Insolvency indicator	0.812^c (0.469)	-0.392^b (0.163)	-21.39^b (9.084)	-3.361 (8.773)	-0.067 (0.159)	-0.090 (0.112)	-3.306 (5.489)	-0.076 (6.180)
Firm Exit	-13.18 (8.056)	-38.88^b (18.44)	-13.56 (34.47)	-14.81 (14.35)	-6.185^b (2.912)	0.487 (8.810)	-49.13^a (14.93)	-24.27 (5.740)
Firm Exit × GDP growth forecast	15.68^a (3.977)	14.99^a (4.057)	15.19^a (4.086)	14.89^a (4.116)	7.253^a (1.426)	7.179^a (1.389)	7.964^a (1.411)	8.378^a (1.464)
Firm Exit × Insolvency indicator	-0.980^b (0.392)	0.245 (0.202)	-2.806 (12.69)	-4.067 (9.921)	-0.257^c (0.133)	-0.108 (0.107)	15.12^a (5.773)	11.35^a (4.203)
Observations	2,655	3,145	3,145	3,145	2,640	3,108	3,108	3,108
R-squared	0.961	0.956	0.956	0.956	0.824	0.800	0.801	0.801

Note: The table reports the estimation results from regressions where the dependent variables, reported on the first row, is the logistic transformation of either 2-year ahead cumulative firm gross entry (four first columns) or 2-year ahead cumulative firm entry net of exits (four last columns), both taken as a ratio of the overall current number of firms. The independent variables are the logistic transformations of current firm entry and firm exit, both taken as a ratio of the overall current number of firms, and their respective interactions with 1- to 2-year ahead GDP growth OECD forecasts or with insolvency indicators. The second row indicates the insolvency indicator considered in each regression. **Cost of insolvency** refers to the cost of the insolvency proceedings, recorded as a percentage of the estate's value. **Recovery rate** refers to how many cents on the dollar claimants recover from an insolvent firm. **Creditor participation** refers to the extent to which creditors are involved in insolvency proceedings. **Time to recover credit** refers to the time, expressed in calendar years, for creditors to recover their credit. Reported coefficients are all in percent. All estimations include the full set of country-sector, country-time, and sector-time fixed effects. Robust standard errors reported in parentheses. ^{a/b/c} indicate statistical significance at the 1%/5%/10% level.

- Better insolvency procedures reduce entry persistence, and increase the sensitivity of entry to past exit.
- But the effect is relatively weak, particularly relative to that of growth forecasts

Some robustness checks

- What is the impact of firms' ability or difficulty to raise funding on the dynamics of entry?

Dependent variable	2-year ahead Cumulative Firm Gross Entry					2-year ahead Cumulative Firm Net Entry				
Getting Credit indicator	Legal rights	Credit to NFS	Credit to NFS Growth	Funding cost	Credit standards	Legal rights	Credit to NFS	Credit to NFS Growth	Funding cost	Credit standards
Firm Entry	19.97 ^b (9.020)	116.2 ^a (42.06)	34.08 ^a (5.404)	33.99 ^a (5.420)	35.76 ^a (5.347)	-0.756 (3.333)	2.824 (13.29)	6.777 ^a (1.969)	6.357 ^a (2.054)	6.875 (2.132)
Firm Entry × GDP growth forecast	-17.15 ^a (2.760)	-18.47 ^a (2.856)	-16.27 ^a (2.839)	-15.22 ^a (2.910)	-17.63 ^a (2.873)	-2.828 ^a (0.936)	-3.494 ^a (0.949)	-3.531 ^a (0.950)	-3.236 ^a (1.040)	-3.638 ^a (0.947)
Firm Entry × Credit indicator	3.709 ^b (1.574)	-16.16 ^c (8.564)	23.94 (16.49)	4.878 ^a (1.257)	57.25 ^a (14.29)	1.118 ^c (0.623)	0.830 (2.787)	-6.269 (7.093)	0.768 (0.611)	1.317 (5.446)
Firm Exit	-19.05 ^c (10.48)	-65.97 (42.90)	-21.79 ^a (7.257)	-13.98 ^b (6.990)	-17.11 ^b (6.933)	-7.715 ^b (3.816)	-59.29 ^a (14.07)	-10.66 ^a (2.488)	-7.577 ^a (2.635)	-8.067 (2.549)
Firm Exit × GDP growth forecast	13.97 ^a (3.925)	11.96 ^a (3.996)	13.59 ^a (4.001)	9.562 ^b (3.983)	11.58 ^a (3.916)	7.205 ^a (1.406)	6.740 ^a (1.375)	7.055 ^a (1.389)	5.892 ^a (1.476)	6.141 ^a (1.384)
Firm Exit × Credit indicator	-0.377 (1.820)	10.10 (8.479)	36.79 (22.52)	-2.214 ^c (1.297)	-6.519 (17.89)	-0.111 (0.695)	10.49 ^a (2.937)	29.32 ^a (8.535)	-0.002 (0.564)	1.017 (6.471)
Observations	3,550	4,096	4,096	4,096	4,096	3,509	4,049	4,049	4,049	4,049
R-squared	0.954	0.946	0.946	0.946	0.946	0.774	0.750	0.750	0.748	0.748

Note: The table reports the estimation results from regressions where the dependent variables, reported on the first row, is the logistic transformation of either 2-year ahead cumulative firm gross entry (four first columns) or 2-year ahead cumulative firm entry net of exits (four last columns), both taken as a ratio of the overall current number of firms. The independent variables are the logistic transformations of current firm entry and firm exit, both taken as a ratio of the overall current number of firms, and their respective interactions with 2-year ahead GDP growth OECD forecasts or with indicators on firms' ability to obtain credit. The second row indicates the specific indicator considered in each regression for firms' ability to obtain credit. Legal rights refers to the degree to which the design of collateral and bankruptcy laws facilitates access to credit. Credit to NFS refers to the log of current credit to the private non-financial sector to GDP. Credit to NFS Growth refers to the 3-year growth in credit to the private non-financial sector to GDP. Funding Cost refers to the difference between the 5-year yield on government bonds and current inflation. Credit standards refers to the change in credit standards applied by banks to loans to the business sector. Reported coefficients are all in percent. All estimations include the full set of country-sector, country-time, and sector-time fixed effects. Robust standard errors reported in parentheses. ^a/^b/^c indicate statistical significance at the 1%/5%/10% level.

- Tight credit standards increase entry persistence
- Plentiful credit and/or strong credit growth raise the sensitivity of entry to past exit

Some robustness checks

- Is not the dynamics of entry essentially about the presence of barriers to entry?

Dependent variable	2-year ahead Cumulative Firm Gross Entry				2-year ahead Cumulative Firm Net Entry			
	Cost	Paid-in capital	Procedures	Time	Cost	Paid-in capital	Procedures	Time
Starting a business indicator								
Firm Entry	19.89^a (6.304)	35.90^a (5.524)	-5.246 (9.330)	19.63^a (6.053)	-0.784 (3.032)	4.281^b (2.148)	-3.715 (3.929)	1.516 (2.589)
Firm Entry × GDP growth forecast	-13.03^a (2.741)	-18.52^a (2.930)	-12.70^a (2.906)	-13.21^a (2.799)	-1.527 (0.988)	-3.769^a (1.010)	-2.066^b (0.971)	-2.297^b (0.944)
Firm Entry × Start indicator	1.731^a (0.387)	0.157 (0.109)	5.568^a (1.036)	0.782^a (0.110)	0.539^a (0.180)	0.100^b (0.0474)	1.062^a (0.361)	0.134^a (0.0433)
Firm Exit	6.640 (8.181)	-17.91^b (7.128)	-14.35^c (8.594)	-10.55 (7.417)	1.223 (3.758)	-8.655^a (2.562)	-5.186 (3.246)	-5.651^b (2.735)
Firm Exit × GDP growth forecast	7.833^b (3.907)	15.85^a (4.182)	13.59^a (3.881)	13.27^a (3.870)	4.861^a (1.427)	9.646^a (1.587)	6.992^a (1.337)	6.904^a (1.315)
Firm Exit × Start indicator	-2.323^a (0.481)	-0.126 (0.123)	-0.472 (0.890)	-0.461^a (0.133)	-0.916^a (0.245)	-0.186^a (0.0621)	-0.454 (0.328)	-0.148^b (0.0649)
Observations	3,550	3,550	3,550	3,550	3,509	3,509	3,509	3,509
R-squared	0.954	0.954	0.954	0.955	0.776	0.774	0.778	0.774

Note: The table reports the estimation results from regressions where the dependent variables, reported on the first row, is the logistic transformation of either 2-year ahead cumulative firm gross entry (four first columns) or 2-year ahead cumulative firm entry net of exits (four last columns), both taken as a ratio of the overall current number of firms. The independent variables are the logistic transformations of current firm entry and firm exit, both taken as a ratio of the overall current number of firms, and their respective interactions with 2-year ahead GDP growth OECD forecasts or with indicators on the ease to start a new business. The second row indicates the specific indicator considered in each regression for the ease to start a new business. **Cost** refers to the cost to start a business in percent of income per capita; **Paid-in capital** refers to the minimal paid-in capital in percent of income per capita, needed to start a business; **Procedures** refers to the number of procedures to start a business; **Time** refers to the number of days needed to start a business. Reported coefficients are all in percent. All estimations include the full set of country-sector, country-time, and sector-time fixed effects. Robust standard errors reported in parentheses. ^{a/b/c} indicate statistical significance at the 1%/5%/10% level.

- Barriers to entry have a significant impact on the dynamics of firm entry: entry more persistent and somewhat less sensitive to past exits
- But impact of growth expectations is broadly robust

Decomposing GDP growth forecasts

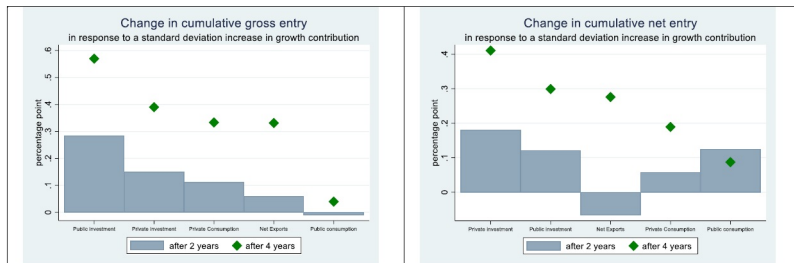
- Which GDP component matters for the dynamics of entry?

Dependent variable	Subsequent Cumulative Firm Gross Entry				Subsequent Cumulative Firm Net Entry			
Yearly horizon	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Firm Entry	41.94* (7.295)	28.69* (6.984)	22.47* (9.442)	31.48* (11.30)	6.339* (1.582)	3.701 (3.162)	-1.639 (4.133)	2.624 (4.243)
× Private Consumption	-13.05* (6.073)	-9.724* (5.424)	-3.526 (6.219)	-14.20* (7.186)	-2.305 (1.464)	0.558 (2.049)	-0.458 (2.649)	-1.400 (2.869)
× Public Consumption	-8.696 (10.39)	-10.21 (8.833)	2.152 (11.48)	-1.599 (15.27)	-4.721* (2.172)	-10.98* (3.488)	-0.457 (4.499)	-5.859 (4.913)
× Private Investment	-17.74* (6.668)	-15.97* (6.044)	-22.52* (7.644)	-25.36* (9.729)	-1.303 (1.423)	-3.050 (2.063)	-0.989 (2.690)	-8.285* (3.202)
× Public Investment	-83.18* (15.33)	-91.91* (14.37)	-100.9* (17.48)	-108.0* (26.65)	-1.934 (3.638)	-6.217 (5.362)	-14.19* (6.578)	-13.07* (7.497)
× Net Exports	-16.81* (6.956)	-9.982 (6.597)	-4.352 (8.689)	-13.48 (11.40)	-2.409* (1.462)	-0.485 (2.645)	4.974 (3.742)	-3.366 (4.157)
Firm Exit	-24.14* (8.295)	-9.614 (8.040)	-11.95 (9.515)	-22.83* (11.35)	-4.594* (1.656)	-2.590 (3.126)	-2.993 (4.572)	-9.288* (4.789)
× Private Consumption	14.15* (7.260)	8.622 (6.261)	7.426 (6.825)	17.48* (8.182)	5.001* (1.805)	3.145 (2.495)	2.167 (3.151)	6.666* (2.959)
× Public Consumption	-8.036 (13.40)	-11.92 (12.16)	-8.057 (14.02)	4.120 (14.64)	-4.916 (3.071)	-2.306 (4.486)	-3.634 (5.699)	0.0342 (5.609)
× Private Investment	16.63* (7.606)	11.54* (6.698)	17.25* (7.895)	15.56 (9.740)	3.181* (1.666)	6.244* (2.396)	9.846* (3.160)	11.07* (3.631)
× Public Investment	75.39* (20.53)	66.62* (18.37)	77.74* (23.10)	79.40* (22.41)	10.65* (5.773)	12.81* (7.736)	20.94* (8.763)	31.04* (9.052)
× Net Exports	13.36* (7.669)	-1.488 (7.716)	2.962 (9.178)	13.82 (11.13)	1.170 (1.802)	-2.997 (3.079)	-1.502 (4.359)	6.893 (4.562)
Observations	4,663	4,096	3,530	2,954	4,627	4,049	3,484	2,914
R-squared	0.921	0.947	0.952	0.954	0.645	0.754	0.829	0.890

Note: The table reports the estimation results from regressions where the dependent variable, reported on the first row, is the logistic transformation of either cumulative firm gross entry (four first columns) or cumulative firm entry net of exits (four last columns) between year $y+1$ and year $y+h$, taken as a ratio of the overall number of firms in year y . The second row reports the horizon h at which the dependent variable is computed. The independent variables are the logistic transformations of firm entry and firm exit in year y , both taken as a ratio of the overall number of firms in year y , and their respective GDP components' contributions to 1- to 2-year ahead GDP growth OECD forecasts. Reported coefficients are all in percent. All estimations include the full set of country-sector, country-time and sector-time fixed effects. Robust standard errors reported in parentheses. ^{a/p/c} indicate statistical significance at the 1%/5%/10% level.

- Investment (public and private) is the main driver for the impact of growth expectations on the dynamics of firm entry

A difference-in-difference exercise



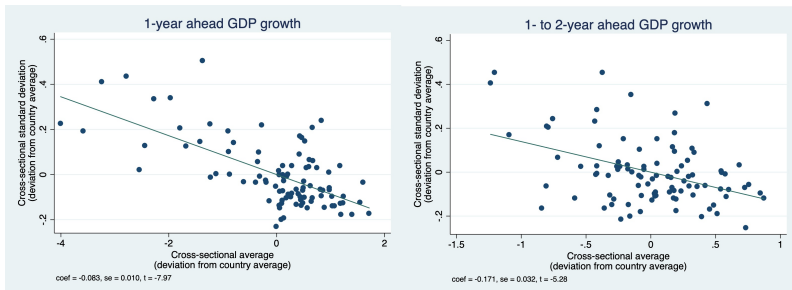
Note: The blue bars (green diamonds) in the left-hand panel represent the relative change in cumulative gross entry after 2 years (after 4 years) in response to a combined one percentage point increase in exit and a one percentage point decrease in entry, when the contribution of each GDP component in the x-axis to future GDP growth increases by one standard deviation. The blue bars (green diamonds) in the right-hand panel represent the relative change in cumulative net entry after 2 years (after 4 years) in response to a combined one percentage point increase in exit and a one percentage point decrease in entry, when the contribution of each component in the x-axis to future GDP growth increases by one standard deviation. Future GDP growth refers to the 1- to 2-year ahead GDP growth OECD forecast. Estimates based on coefficients reported in Table 14.

- ▶ In response to a combined one pp drop in past entry and a one pp increase in past exit,
 - ▶ entry increases by an additional 0.6 pp after 4 years after a one sd increase in the contribution of public investment to expected GDP growth.
 - ▶ By contrast, changes in public consumption contribution to expected GDP growth makes little to no difference

Conclusions

- ▶ Empirical exercise to understand what drives the dynamics of firm entry
- ▶ Main take-away: aggregate economic outlook plays a crucial role in the sectoral dynamics of firm entry
 - ▶ Higher growth expectations reduce entry persistence and raise firm entry in response to past exits
- ▶ Main conclusions hold against a variety of alternative possibilities
 - ▶ current vs: expected economic conditions
 - ▶ structural vs. cyclical factors
- ▶ Special role for fiscal policy in fostering business dynamism through expectations of public investment

Better growth forecasts come with reduced uncertainty



Better growth forecasts come with reduced uncertainty. Each panel plots the average and standard deviation of individual forecasts for GDP growth the US, Germany, France, the United Kingdom, Italy, Spain and Japan, for the period 2008-2019, as reported in the Consensus Forecast publication. [back](#)