Growth Expectations and the Dynamics of Firm Entry*

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Abstract

How do aggregate conditions affect the dynamics of firm entry? Do recessions force more firms out, allowing for more firms to enter subsequently? Or does this process require other circumstances to thrive? To revisit these (old) questions, I investigate how entry depends on past entry and exit developments using sectoral data on firm entry and exit for the main economies of the Euro Area over 2009-2019. My main finding is that expected, rather than current, GDP growth shapes the dynamics of firm entry. Specifically, I show that (i) entry increases with past exit at the sector-level, but only when GDP growth forecasts are sufficiently strong, while (ii) entry depends positively on past entry, but less so with strong GDP growth forecasts. These findings are robust to the inclusion of several controls. This includes the quality of insolvency proceedings, firms' ability to obtain credit or the presence of barriers to entry. Finally, I break-down GDP growth forecasts and show that contributions of private and public investment to expected growth drive the impact of growth expectations on the dynamics of firm entry.

JEL codes: D25, D84, E32, E62, H32, M13.

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Following the outbreak of the Covid-19 pandemic, governments around the globe took extraordinary measures to shield firms and households from the economic consequences of the recession that the world was about to face (IMF (2020)). To do so, public authorities devoted unprecedented amounts to support the corporate sector in their respective jurisdictions, deploying a wide array of policy measures, from job retention schemes to credit guarantees or even outright credit extension.[1]

This massive government intervention however triggered a debate as to the appropriate scope, size and length of policy support. On the one hand, some suggested that stimulus policies should be relatively light, and phased out swiftly as to let severely affected firms exit (see Bettendorf et al. (2021) or Hodbod et al. (2021)). This would make room for new firms – more productive and better suited to navigate the new economic landscape – to emerge and jump-start growth across different sectors of the economy. On the other hand, proponents of strong policy support highlighted aggregate demand externalities (Palazzo et al. (2020)). Letting firms go bust could trigger adverse spirals and produce a broad-based contraction in demand, as well as large scale employment destructions. These would further depress prospects, thereby leading to additional waves of firm exits. At the same time, the scale of public support needed to avoid these adverse spirals was such that policy interventions needed to be targeted to distressed firms and sectors. Otherwise, the pecuniary cost to public accounts could prove very significant (Gourinchas et al. (2020)).[2]

Assessing which of these two views is more likely to hold however requires a proper understanding of the dynamics of firm entry. If firm entry is indeed very responsive to past exit, even in the absence of specific support or during deep recessions, then the first option consisting of relatively light stimulus policies, would seem appropriate. If however, entry needs specific conditions or support to thrive, then the second option seems more suitable.

To shed light on these questions, I look into the dynamics of firm entry, and the factors most likely to affect it. Specifically I ask two sets of questions. First, how does entry depend on past entry and exit developments? And how tight and durable are these relationships,

[1] According to IMF (2020), Advanced Economies spent on average about 12% of their respective GDP in 2020 for financial assistance to firms in the form of equity injections, loans extensions and credit guarantees.

[2] In the specific context of the Covid-19 recession, available studies rather suggest that blanket support, which arguably reduced reallocation, still benefited higher productivity firms (see Andrews et al. (2021) and Martin et al. (2021).

if any? Second, what affects these relationships? In other words, are there conditions or policies, under which more entry or exit at a point in time lead to stronger or weaker entry down the road?

To carry out this investigation, I proceed in two steps. I first build a simple model of firm entry and exit that relies on three key assumptions: First, entry takes time to bear fruit or put differently, firms need to take the decision to enter before the state of the economy is realised. In practise, this means that firms which enter at time t effectively start operations —and reap profits— only at time $t+1$. As a result, entry depends on expectations of future profits, and hence on expectations of future demand. Second, firms are risk averse and future demand is uncertain. Moreover, consistent with empirical evidence, uncertainty around future demand tends to be higher when demand is expected to be weaker[3]. Last, entry requires paying a fixed cost, some of which has to be borne *ex ante*, i.e. at the time of entry, while the other part is paid *ex post*. In addition, each entry cost depends positively on the current level of output and negatively on the current number of firms in operation.

This framework delivers three predictions. First, higher entry in the past leads to higher entry in the future, as higher past entry reduces the (*ex ante*) fixed cost of entry. Second, higher demand —current or expected— leads to higher entry, as higher *expected* demand raises expected profits, while, output being positively correlated over time, higher *current* demand leads to higher expected demand, and hence to higher entry. Third and last, higher entry in the past raises entry subsequently, but less so when *expected* demand is high. When past entry increases, the entry cost falls. But higher current or expected output mitigates this fall, so that subsequent entry increases by less. There is however a key difference here. Higher *expected* demand comes with reduced uncertainty, implying a larger mitigating effect on the entry cost. Conversely, higher *current* demand does not carry the same effect. The dynamics of entry is therefore more sensitive to *expected* than to *current* demand when firms.

Second, I conduct an empirical analysis based on the experience of the main Euro Area countries from 2009 to 2019, which confirms these predictions. Specifically, a increase

[3] Figure 7 in appendix provides empirical evidence suggesting that stronger GDP growth forecasts are associated with lower a dispersion across individual forecasts and hence less uncertainty, especially at longer forecast horizons

in exits leads to reduced entry subsequently when GDP growth is expected to be weak. Similarly, a drop in current entry weighs on subsequent entry, particularly when GDP growth is expected to stay low. Conversely, with strong GDP growth forecasts, an increase in past exit is more likely to trigger additional entry subsequently while subdued entry is less likely to carry over.

I run several robustness checks to test these empirical results. Consistent with the analytical framework, there is no clear evidence that *current* GDP growth affects the dynamics of entry. Empirically, *current* GDP growth makes little difference to the forward path of entry, once GDP growth *forecasts* have been taken into account. Moreover, I investigate factors that likely affect the dynamics of entry, e.g. barriers to entry, the quality of insolvency regimes or the ability to raise credit. Here, I find evidence that these variables all affect —to varying degrees— the dynamics of entry. Their impact remains however marginal, relative to that of GDP growth expectations. Last, I decompose GDP growth expectations into expected contributions of consumption, investment and net exports. Here, I show that private and public investment drive the impact of GDP growth expectations on the dynamics of entry.

This paper builds on a large body of literature investigating the dynamics of entry and the interaction between entry dynamics and aggregate conditions. A first strand of literature has looked into the two-way interaction between entry and exit on the one hand and the business cycle on the other hand. In their seminal paper, Caballero and Hammour (1994) argue that firm exit plays a key role in improving overall productivity, as it allows resources to be reallocated more easily, from exiting firms to entering and surviving ones that, in theory, are more productive. In this respect, recessions play a key role, as periods of disproportionate exits. Pe'er and Vertinsky (2008) empirically confirm these intuitions, showing that exits of old firms tend to lift entry, new entrants being usually more productive. Similarly, Johnson and Parker (1994) provide an analysis of the interrelationships between firm births and deaths—which we build on—with an application to the retail sector. Looking at different business cycle phases, Asturias et al. (2023) argue that aggregate productivity growth depends more on firm entry and exit during high growth periods, while entry and exit have been shown to account for a sizeable part —almost 20%— of the output response to productivity shocks. (Clementi and Palazzo (2016)). Consistent with these findings, Gourio et al. (2016) show that a fall in the number of new-born firms has long-lasting detrimental effects on output and productivity. That said, the literature has also stressed that other factors, not least the presence of financial frictions and financial shocks, may hamper the cleansing effect that comes with firm exit (see Barlevy (2003), Aghion et al. (2007) or Osotimehin and Pappadà (2017)).

Turning to business cycle properties, entry and exit have been shown to be respectively pro- and counter-cyclical (see Cook (2001) or Crane et al. (2022) for instance), a property we also uncover in our data (see below). Looking at lead-lag correlations, Tian (2018) finds that entry indicators tend to lead the business cycle while exit indicators tend to lag it. Closer to this study, competition and market size considerations have been shown to matter for entry, through their impact on profits of new entrants (Campbell and Hopenhayn (2005)). Similarly, Sedláček and Sterk (2017) and Moreira (2017) argue that recessions are not simply times of low entry but also that new firms tend to be smaller. Conversely, Cavallari et al. (2021) show, using employer-employee matched data for Italy, that recessions induce fewer but better businesses to enter the market, the authors relating the latter finding to the presence of rigidities on the labour and the goods markets in Italy. Closest to this study, Bilbiie et al. (2012) is one of the few papers that gives a central role to expectations of future profits in driving firm entry. Yet, none draws an explicit link between the dynamics of entry and expectations of future economic activity.

The rest of the article goes as follows. The next section provides a simple model that underpins the empirical analysis. Section 3 provides an overview of the data used in the paper. Section 4 lays out the empirical strategy as well as some first evidence on the dynamics of entry. Section 5 introduces growth expectations and looks at how they shape the dynamics of entry, in addition to running a number of robustness checks and extensions. Conclusions are finally drawn in section 6.

1 Entry, exit and growth expectations: a simple framework

I start by sketching a simple model linking entry, exit and growth expectations. For this, I consider an economy where output y_t consists of a continuum of differentiated goods across sectors. In each sector s, there is a measure n_s of firms, each firm producing a differentiated variety of the sectoral good s. Denoting $\alpha(s)$ a sectoral shifter, which satisfies $\int_0^1 [\alpha(s)]^{\frac{1}{\sigma}} ds = 1$, σ the elasticity of substitution across sectoral goods, and θ the elasticity of substitution between varieties of a given good s, aggregate output y_t and sectoral output y_{st} at date t respectively write as:

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

As is clear from the notation in the second expression of (1), firms can produce at date t if they enter or are on the market at date $t-1$. In other words, we make the arguably realistic assumption that firms need to take their entry decision **before** knowing the relevant state of the economy.

Let me then denote the general price level in the economy as $p_t = \left[\int_0^1 \alpha(s)[p_t(s)]^{1-\sigma} ds\right]^{\frac{1}{1-\sigma}}$ and the price level in sector s as $p_t(s) = \left[\int_0^{n_{st-1}} [p_{st}(i)]^{1-\theta} ds\right]^{\frac{1}{1-\theta}}$ where $p_{st}(i)$ is the price of the variety i of good s. Then denoting c the marginal cost of production, the date-t profit for firm i operating in sector s and charging a price $p_{st}(i)$ writes as

$$\pi_{st}(i) = [p_{st}(i) - mc]\, y_{st}(i) = [p_{st}(i) - c]\left[\frac{p_t(s)}{p_t}\right]^{-\sigma}\left[\frac{p_{st}(i)}{p_{st}}\right]^{-\theta} \alpha(s)\, y_t \tag{2}$$

Assuming $\theta > 1$, firms then charge a constant markup over the marginal cost c, i.e. $p_{st}(i) = \frac{\theta}{\theta-1}c$. Then assuming firms face the same marginal cost of production within and across sectors, the relative price of the variety i of good s writes as $p_t(s) = [n_{st-1}]^{-\frac{1}{\theta-1}} \frac{\theta}{\theta-1}c$, while the general price level satisfies $p_t = \left[\int_0^1 \alpha(s)[n_{st-1}]^{\frac{\sigma-1}{\theta-1}} ds\right]^{-\frac{1}{\sigma-1}} \frac{\theta}{\theta-1}c$. Based on these expressions, a firm entering at date t in sector s would reap profits profits:

$$\pi_{st+1} = \frac{c}{\theta-1}\frac{1}{[n_{st}]^{\frac{\theta-\sigma}{\theta-1}}}\frac{\alpha(s)\, y_{t+1}}{\left[\int_0^1 \alpha(i)\,[n_{i,t}]^{\frac{\sigma-1}{\theta-1}}\, di\right]^{\frac{\sigma}{\sigma-1}}} \tag{3}$$

These profits are decreasing in the number of firms within the same sector n_{st} provided the elasticity of substitution θ within sectors is larger than the elasticity of substitution σ across sectors, an arguably realistic assumption. With this expression for firms' profits, I can now turn to the study of firm entry and how it relates to past entry and exit.

For this, let me us assume that firms which enter at date t in sector s must pay a fixed cost of entry C_{st} which decomposes into an ex ante fixed cost C^a_{st} and an ex post fixed cost C^p_{st+1}:

$$C_{st} = C^a_{st} + C^p_{st+1} \text{ with } C^i_{st} = c^i y_t - n_{st-1} \text{ and } c^i \geq 0 \text{ for } i = \{a; p\} \tag{4}$$

The ex ante fixed cost of entry C^a_{st} therefore depends positively on current output y_t and negatively on the past number of firms n_{st-1}, while the ex post fixed cost of entry C^p_{st+1} depends negatively on *future* output growth y_{t+1}. Then denoting firms' preferences U, firms enter in sector s if and only if $U(\pi_{st+1} - C_{st}) \geq 0$, so that the condition $U(\pi_{st+1} - C_{st}) = 0$ determines the number of operating firms in sector s. To solve for this free entry condition, let me adopt the following notation and make the following assumptions.

- Output at date $t+1$ output is a linear combination of date-t output y_t, some time-varying intercept g_{t+1}, and a white noise denoted ε_{t+1}: $y_{t+1} = \alpha y_t + g_{t+1} + \varepsilon_{t+1}$.
- Firms have mean-variance preferences, i.e. $U(x) = \mathbb{E}[x] - \gamma\sqrt{\mathbb{V}[x]}$, with γ a positive scalar.
- The average for the intercept g_{t+1} is denoted m_{t+1}, i.e. $\mathbb{E}_t[y_{t+1}] = \alpha y_t + m_{t+1}$, and σ^2_{t+1} denotes the variance of date-$t+1$ output, i.e. $\sigma^2_{t+1} = \mathbb{V}_t[y_{t+1}]$.

Then, writing the profits of a firm operating in sector s as $\pi_{st+1} = [n_{st}]^{-\frac{\theta-\sigma}{\theta-1}}\,\overline{\pi_{st+1}}y_{t+1}$, the equilibrium number of firms n_{st} in sector s satisfies:

$$\ln n_{st} = \frac{\theta-\sigma}{\theta-1}\left[\ln\overline{\pi_{st+1}} - \ln\frac{c^a y_t - n_{st-1} + c^p[\alpha y_t + m_{t+1} - \gamma\sigma_{t+1}] - n_{st}}{\alpha y_t + m_{t+1} - \gamma\sigma_{t+1}}\right] \tag{5}$$

Using expression (5), it is straightforward to derive a several simple comparative static properties. First, the number n_{st} of firms operating at date $t+1$ depends positively on the number n_{st-1} of firms operating at date t. In other words, higher entry —in gross or net terms— at date $t-1$ is followed by higher entry —in gross or net terms— at date t:

$$\frac{\partial \ln n_{st}}{\partial n_{st-1}} = \frac{\theta-\sigma}{\theta-1}\left[c^a y_t - n_{st-1} + c^p\left[\alpha y_t + m_{t+1} - \gamma\sigma_{t+1}\right] - n_{st}\right]^{-1} > 0 \tag{6}$$

This positive relationship simply reflects the assumption that a larger number of firms is associated with a lower entry cost, which raises incentives for entry. Moreover, in line with empirical evidence, the average and the volatility of future output are negatively correlated, i.e. $\partial\sigma_{t+1}/\partial m_{t+1} < 0$.[4] It therefore follows that higher average future output is always associated with higher entry, i.e. $\partial \ln n_{st}/\partial m_{t+1} > 0$. Moreover, higher average future output is associated with a weakened impact of past entry on subsequent entry:

$$\frac{\partial}{\partial m_{t+1}}\frac{\partial \ln n_{st}}{\partial n_{st-1}} = -\frac{\theta-\sigma}{\theta-1}\frac{c^p\left(1-\gamma\partial\sigma_{t+1}/\partial m_{t+1}\right)}{\left[c^a y_t - n_{st-1} + c^p\left[\alpha y_t + m_{t+1} - \gamma\sigma_{t+1}\right]\right]^2} < 0 \tag{7}$$

To put it differently, current entry depends positively on past entry but less so when expectations of future output are stronger, when the outlook for output looks brighter. To be sure, the same type of property holds for current output: Higher current output also tends to weaken the link between the past and the current number of firms in operation. However contrary future output, fluctuations in current output do not lead to any change in uncertainty so that the dampening effect of current output is typically weaker whenever

$$1-\alpha+\gamma\left[-\frac{\partial\sigma_{t+1}}{\partial m_{t+1}}\right] > \frac{c^a}{c^p} \tag{8}$$

In other words, when new entrants are sufficiently risk averse (γ is sufficiently large) and/or uncertainty σ_{t+1} is sufficiently sensitive to changes in expected growth m_{t+1}, then growth expectations matter more than current growth for the dynamics of entry. Now with the comparative statics (6) and (7) at hand, I can turn to the empirical analysis.

[4]See evidence reported in Figure 7 in Appendix.

2 Entry, exit and business turnover: an overview

2.1 Data

To investigate the relationship between entry, exit and the economic outlook, I draw on several datasets. First, the Eurostat database on Business demography indicators provides data on firm entry, exit and the overall number of active firms at the sectoral level for several European countries, starting from the mid-2000's. It also provides information on employment creation and destruction by entering and exiting firms, as well as overall employment, also at the sectoral level.[5] The sample covers the seven largest economies of the Euro Area, namely, Austria, Belgium, Germany, Spain, France, Italy and the Netherlands, which taken together account for more than 80% of Euro Area GDP. For the sake of balancedness, the analysis starts in 2009 and ends in 2019, even if data for Belgium and Germany only starts half-way through (in 2013). The dataset covers all sectors of the economy. I however exclude "Agriculture" and "Financial and Insurance Activities" and focus on all available 2-digit sectors in "Mining and Quarrying", "Manufacturing", "Electricity, Gas, Steam and air conditioning supply"," Water supply; Sewerage, Waste management and remediation activities", "Construction", "Wholesale and retail trade; Repair of motor vehicles and motorcycles", "Transportation and storage", "Accommodation and food activities", "Information and communication", "Real estate activities", "Professional, Scientific and Technical activities", "Administrative and support service activities", "Education", "Human health and social work activities", "Arts, Entertainment and recreation" and "Other service activities" Second, I collect vintages of the OECD economic Outlook and IMF World Economic Outlook databases, with a view to measure growth forecasts for different macroeconomic variables (GDP, private and public consumption, private and public investment, and net exports). I also use these databases to build real-time estimates of current growth (see below for more details). Third, the OECD Structural Policy Indicators Database for Economic Research (Egert et al. (2017)) database provides country-level data for regulatory indicators, focusing on three set of regulations:

[5]For the sake of brevity, I focus the presentation of the empirical results on the dynamics of firm entry. Results pertaining to the dynamics of firm employment creations by new entrants, are qualitatively similar, and available upon request.

(i) those affecting the quality of insolvency regimes, (ii) those affecting firms' ability to obtain credit, and (iii) those governing firm entry. Last, I draw on the Euro Area Bank Lending Survey (BLS) and the BIS Macroeconomic dataset for data on lending standards, funding costs and credit to the corporate sector.

2.2 A bird's-eye view of entry and exit

I start the empirical analysis by computing for each country, simple statistics for gross entry and exit rates. I define the gross entry rate e_{ist} (the gross exit rate x_{ist}) in country i in sector s in year t as the ratio of the number of firms entering E_{ist} (the number of firms exiting X_{ist}) to the total number of active firms N_{ist} in country i in sector s in year t:

$$e_{ist} = \frac{E_{ist}}{N_{ist}} \text{ and } x_{ist} = \frac{X_{ist}}{N_{ist}} \tag{9}$$

Summary statistics in Table 1 show that on average, the gross entry rate exceeds in most countries the gross exit rate, suggesting that firm entry has been on net, positive over the period considered (2009-2019).

		Firm Entry in percent of total number of firms					**Firm Exit** in percent of total number of firms				
Country	Obs.	Aver.	Std Dev.	1^{st} quart.	median	3^{rd} quart.	Aver.	Std Dev.	1^{st} quart.	median	3^{rd} quart.
AT	781	8.7%	3.8%	5.5%	8.4%	11.3%	7.4%	3.2%	5.0%	7.3%	9.5%
BE	424	3.5%	2.1%	2.1%	3.0%	4.2%	0.9%	0.5%	0.6%	0.8%	1.2%
DE	494	7.1%	3.6%	4.2%	6.5%	9.6%	7.1%	2.7%	4.9%	7.0%	8.9%
ES	760	9.3%	3.7%	6.7%	9.2%	11.7%	9.6%	3.2%	7.3%	9.4%	11.5%
FR	637	10.7%	5.0%	7.1%	10.3%	13.5%	10.0%	4.3%	7.4%	9.9%	12.0%
IT	778	9.2%	4.1%	6.2%	9.0%	11.4%	7.7%	2.8%	5.7%	7.4%	9.2%
NL	789	10.1%	4.0%	7.5%	9.4%	11.9%	9.5%	2.9%	7.6%	9.1%	11.3%
TOT	4663	8.7%	4.4%	5.4%	8.4%	11.4%	7.9%	3.9%	5.4%	8.0%	10.3%

Table 1: The dynamics of entry. 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.

Consistent with this observation, median gross entry rates (aggregated by country) also exceed corresponding median gross exit rates in all countries, but Spain, where exits slightly exceed entries. Gross entry rates also display a larger dispersion than gross exit rates in all countries, as is visible from the respective standard deviations. Interestingly, this larger dispersion of entry rates typically comes from the upper part of the distribution

(3rd quartile), which is more skewed towards high values in the case of entry than in the case of exit.

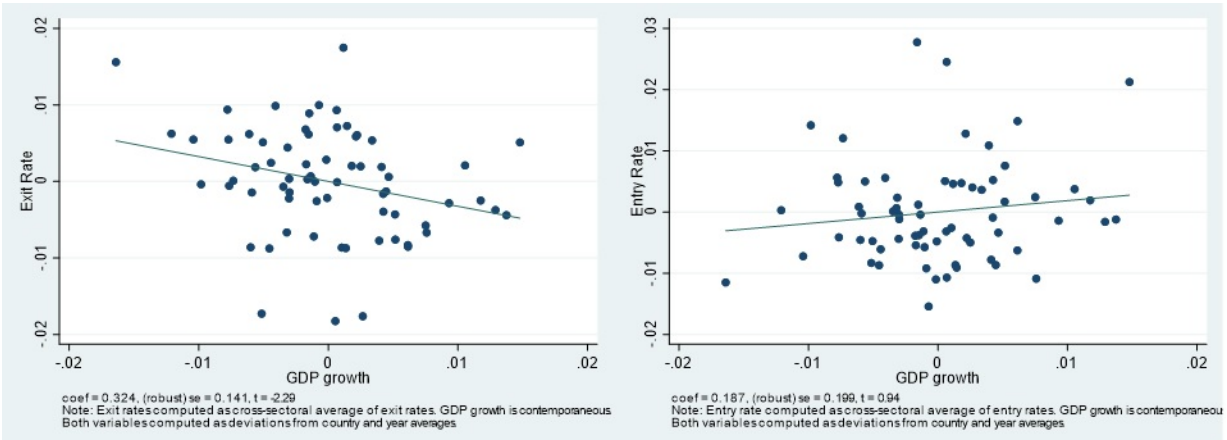

Figure 1: Growth cuts exit and raises entry. The left-hand panel plots current GDP growth against the current exit rate. The right-hand panel plots current GDP growth against the current entry rate. Entry and exit rates are computed as simple averages of corresponding entry and exit rates, and centred relative to country and time averages. GDP growth rates are also centred relative to country and time averages.

Turning now to the cyclical properties of entry and exit, a simple average of sectoral exit and entry rates by country and year shows that exit is counter-cyclical —more firms exit when GDP growth is low— while entry is mildly pro-cyclical (Figure 1, left-hand panel). Conversely, the correlation of entry with GDP growth is only weakly positive (Figure 1, right-hand panel).[6] High-growth periods display more firm entry than low-growth periods, but the difference in this sample, is barely significant. A simple analysis of lead-lag correlations between entry and exit also shows that more exits tend to be followed by significantly less entry (Figure 2, left-hand panel) and more exits (Figure 2, right-hand panel) after one year. On the contrary, the data provides no evidence of a significant correlation between current changes in entry and subsequent changes in entry or exit.

[6] Interestingly, the Covid-19 recession also suggests only a weak link between entry and GDP growth. Based on business registration and bankruptcy data, it appears that countries like Spain and Italy experienced deep falls in new business registrations in 2020 as they suffered major output contraction.

Conversely, countries like Belgium and France also suffered significant output losses but new business registrations only faced minor falls, if not outright increases as was the case in France. Finally in Germany, output losses were very much contained but new business registrations fell dramatically.

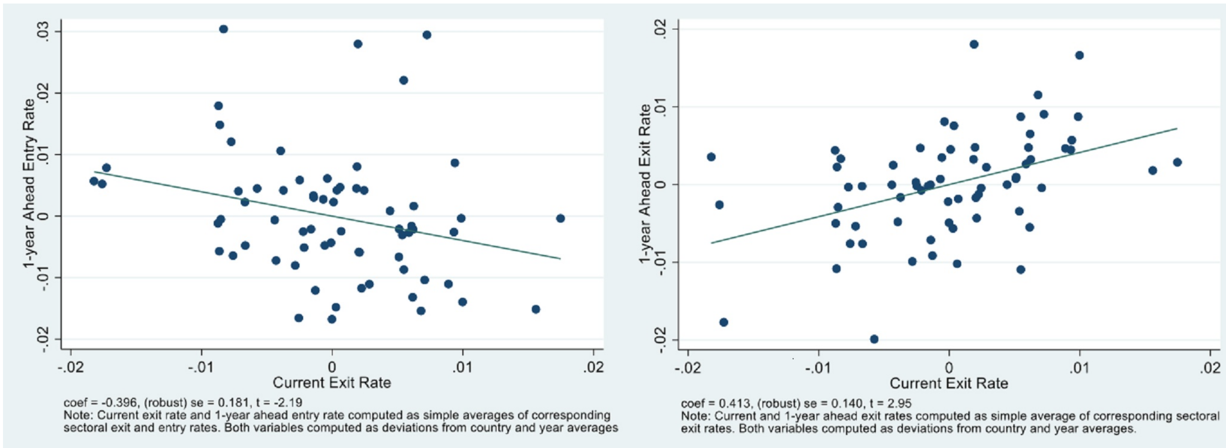

Figure 2: Exit hinders entry and beget exit. The left-hand panel plots the current exit rate against the 1-year ahead entry rate. The right-hand panel plots the current exit rate against the 1-year ahead exit rate. Both entry and exit rates are computed as simple averages of corresponding entry and exit rates, and centred relative to country and time averages.

3 The dynamics of entry at the sector-level

3.1 The empirical strategy

Absent a clear pattern for aggregate entry over the business cycle or in relation to subsequent entry and exit, dis-aggregated sector-level information can provide useful insights into the dynamics of entry, thanks to sectoral variations in entry across countries and time. I therefore estimate a set of regressions where the dependent variable is the cumulative gross entry rate in country i in sector s, h years ahead, denoted as c^g_{ist+h}, and defined as the ratio of the cumulative sum of gross entries to the current number of active firms. Similarly, I define the cumulative net entry rate in country i in sector s, h years ahead, denoted as c^n_{ist+h}, as the ratio of the cumulative sum of gross entries net of exits to the number of active firms:

$$c^g_{ist+h} = \frac{E_{ist+1} + \ldots + E_{ist+h}}{N_{ist}} \text{ and } c^n_{ist+h} = \frac{E_{ist+1} - X_{ist+1} + \ldots + E_{ist+h} - X_{ist+h}}{N_{ist}} \text{ for } h = 1; 2; \ldots \quad (10)$$

As explanatory variables, I include the current gross entry and exit rates in country i in sector s, in year t, e_{ist} and x_{ist}.[7] In addition, I saturate the specification with fixed effects.

[7]Johnson and Parker (1994) use a similar empirical specification, linking forward values of entry to current values of entry and exit.

Denoting λ_{it} the country-year fixed effects; μ_{is} the country-sector fixed effects, ν_{st} the sector-year fixed effects, and ε the residuals, the baseline specification estimating the cumulative gross entry rate writes as:[8]

$$\ln\left(\frac{c^{g}_{ist+h}}{1-c^{g}_{ist+h}}\right) = \beta_e^{(h)} \ln\left(\frac{e_{ist}}{1-e_{ist}}\right) + \beta_x^{(h)} \ln\left(\frac{x_{ist}}{1-x_{ist}}\right) + \lambda_{it}^{(h)} + \mu_{is}^{(h)} + \nu_{st}^{(h)} + \varepsilon_{ist}^{(h)} \tag{11}$$

Because entry and exit rates are bounded between 0 and 1, I apply logistic transformations to all variables in specifications (11) so that variables included in the regression are unbounded, making linear inference appropriate. Moreover, defining the dependent variables as a ratio of the *current* number of active firms ensures that they share the same denominator with the independent variables, thereby avoiding risks of spurious correlations.[9] Complementing the analysis of gross entry, I also estimate a similar type of specification for net entry as follows:

$$\ln\left(\frac{1+c^{n}_{ist+h}}{1-c^{n}_{ist+h}}\right) = \beta_e^{(h)} \ln\left(\frac{e_{ist}}{1-e_{ist}}\right) + \beta_x^{(h)} \ln\left(\frac{x_{ist}}{1-x_{ist}}\right) + \lambda_{it}^{(h)} + \mu_{is}^{(h)} + \nu_{st}^{(h)} + \varepsilon_{ist}^{(h)} \tag{12}$$

Here, a similar type of (logistic) transformation is applied, considering in this specific case, that net entry ranges between -1 to $+1$.

The parameters of interest in specifications (11) and (12) are $\beta_e^{(h)}$ and $\beta_x^{(h)}$. They capture the change in cumulative (gross or net) entry at different horizons following a increase in past entry or past exit. Following the comparative statics result (6), one would expect $\beta_e^{(h)} > 0$ and $\beta_x^{(h)} < 0$ Moreover because specifications (11) and (12) use non-linear transformations of entry and exit rates, I evaluate the change in (gross or net) entry at different horizons following a given increase/decrease in entry or exit at the median. Denoting m_e and m_x the respective sample medians for gross entry and exit rates, and m_g^h and m_n^h, the respective sample medians for cumulative gross and net entry rates, h years ahead, these changes

[8]The country-time fixed effects in particular purge dependent and independent variables from the impact of any macroeconomic variable.

[9]Spurious correlations can arise if cumulative entry rate is simply computed as the cumulative sum of entry rates. In this case, a large number of exits, for instance, reduces the subsequent number of active firms, which would artificially raise subsequent entry rates.

respectively write as:

$$\frac{dc^{g}_{ist+h}}{dz_{ist}} = \frac{m^h_g}{m_z}\frac{1-m^h_g}{1-m_z}\beta^{(h)}_z \text{ and } \frac{dc^{n}_{ist+h}}{dz_{ist}} = \frac{1}{m_z}\frac{1-\left(m^h_n\right)^2}{1-m_z}\frac{\beta^{(h)}_z}{2} \text{ for } z=\{e;x\} \tag{13}$$

3.2 The empirical results

3.2.1 The baseline regressions

I now turn to the empirical results, starting with the baseline specifications (11) and (12).[10] Table 2, which provides the estimation results, has two main takeaways.

Dependent variable	Cumulative Firm Gross Entry				Cumulative Firm Net Entry			
Yearly horizon	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Firm Entry	17.87[a]	8.645[b]	5.747	5.078	2.956[a]	1.044	-1.413	-3.836
	(3.635)	*(3.377)*	*(4.125)*	*(5.499)*	*(0.783)*	*(1.647)*	*(1.951)*	*(1.689)*
Firm Exit	-2.981	2.122	3.695	2.614	0.325	2.005[c]	3.284[b]	2.948[c]
	(2.883)	*(2.764)*	*(3.174)*	*(3.568)*	*(0.781)*	*(1.152)*	*(1.467)*	*(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

Table 2: The dynamics of entry. 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 $t+1$ and $t+h$, taken as a ratio of the overall number of firms in year t. 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 t, both taken as a ratio of the overall number of firms in year t. 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.

First, gross firm entry displays significant time persistence (first row): Higher entry is associated with significantly higher subsequent cumulative entry up to 2 years ahead. Net entry shows a similar pattern although the magnitude and significance of estimated coefficients drops more quickly over time, suggesting that shocks affecting net entry have less persistent effects than those affecting gross entry. The second take-away is that exits do not seem to affect the forward path of *gross* entry. If estimated coefficients turn from negative to positive starting from the second year onward, none is statistically significant.

[10] All empirical results are based on regressions where standard errors are clustered at the country-sector level.

Current exits do however seem to correlate positively with subsequent *net* entry, likely reflecting the impact on subsequent exits.

To get a sense of the magnitudes implied from these estimates, I consider the implications of a one percentage point drop in the gross entry rate coupled with a one percentage increase in the gross exit rate, on subsequent cumulative gross and net entry rates. Using expressions for marginal impacts in (13), Figure 3 shows that both gross and net entry fall significantly after one year in response to a drop in entry and increase in exit. The fall is however small, and amounts in both cases, to about 0.2 percentage point, which represents roughly 10% of the combined impulse in entry and exit. In addition, the impact on gross entry fades away after one year and is statistically insignificant from two years ahead onward. Net entry shows a similar pattern although the cumulative response becomes positive and significant, but only after four years.

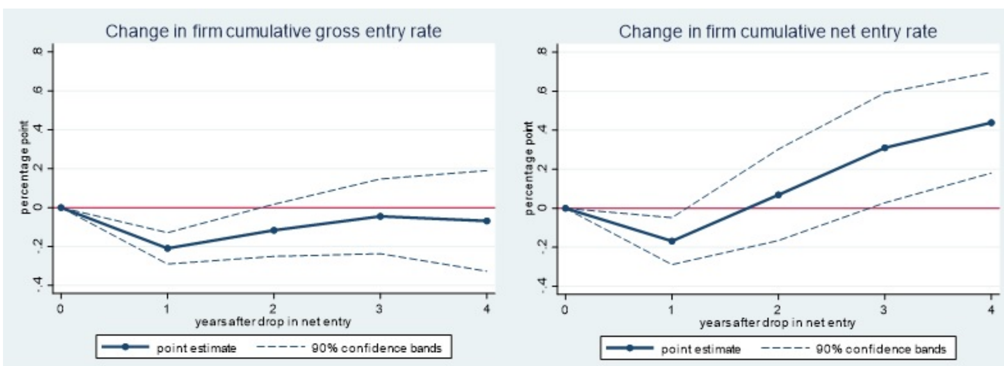

Figure 3: The dynamics of gross and net entry. The table reports the estimation results from regressions where the dependent variable, reported on the first row, is the logistic transformation of either cumulative firm gross entry (four first columns) or cumulative firm entry net of exits (four last columns) between year $t+1$ and $t+h$, taken as a ratio of the overall number of firms in year t. 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 t, both taken as a ratio of the overall number of firms in year t. 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.

3.2.2 The dynamics of entry across sectors, countries and time.

Industry vs. service sectors Previous estimates for the dynamics of entry are likely to hide significant differences across sectors, countries and time. I below explore each of them separately, starting with possible differences between industry and service sectors. For this

I re-estimate specifications (11) and (12), allowing the coefficients of interest —$\beta_e^{(h)}$ and $\beta_x^{(h)}$ that link entry and exit to subsequent cumulative entry— to differ between industry and service sectors. Labelling sectors in mining, manufacturing, utilities and construction as industry sectors and the other ones as service sectors, Table 3 shows two main differences.

Dependent variable	**Cumulative Firm Gross Entry**				**Cumulative Firm Net Entry**			
Yearly horizon	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Firm Entry	14.69[a]	4.035	2.437	4.921	0.869	0.751	0.841	-1.109
industry	*(4.970)*	*(4.292)*	*(3.953)*	*(4.038)*	*(0.798)*	*(1.309)*	*(1.626)*	*(1.669)*
Firm Entry	19.20[a]	10.35[a]	7.199	4.454	3.825[a]	1.031	-2.483	-5.397[a]
services	*(4.232)*	*(3.988)*	*(5.227)*	*(7.377)*	*(0.945)*	*(2.085)*	*(2.394)*	*(2.085)*
Firm Exit	-5.006	-3.896	0.181	-3.297	-0.490	0.365	1.383	-0.329
industry	*(5.032)*	*(3.516)*	*(3.034)*	*(3.697)*	*(0.682)*	*(0.938)*	*(1.315)*	*(1.420)*
Firm Exit	-2.343	4.918	5.550	6.019	0.544	2.772[c]	4.189[b]	4.503[b]
services	*(3.242)*	*(3.449)*	*(4.228)*	*(4.645)*	*(0.969)*	*(1.510)*	*(1.904)*	*(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

Table 3: The dynamics of entry in industry and services. 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.

On the one hand, time persistence in gross entry is stronger for service than for industry sectors. Entry in services therefore comes in waves that extend over many years. On the contrary, changes in entry in industry sectors carry over only for a short period and to a much lesser extent. On the other hand, the relationship between exit and subsequent cumulative entry also seems to differ markedly between industry and service sectors. In industry sectors, more exits are associated with less entry down the road, while in services, exits seem to be followed with higher subsequent entry. In the case of net entry, this difference is even starker as the relationship between exits and subsequent net entry is positive and significant for service sectors but insignificant in the case of industry services. New entrants are therefore more willing to pick up the slack left by exiting firms in service sectors, where arguably factors limiting entry, like high capital intensity, are not as pronounced as they can be in industry sectors.

Before and after financial crises Changes over time in the dynamics of entry is yet another important difference that may be blurred by estimating single coefficients over the full sample. In the specific case of Euro Area countries, this is likely to be particularly relevant as economies faced two major shocks in the period up to 2013 —the Global Financial Crisis and the European Sovereign Debt Crisis—, while the period that followed was much smoother. Large economic fluctuations being arguably more likely to come with large and long-lasting changes in entry and exit, I re-estimate the baseline specifications (11) and (12) allowing the coefficients of interest to differ for the period up to 2013 and the period starting after 2013. Empirical results in Table 4 show that the dynamics of entry differs significant over the two time periods.

In the period running up to 2013, gross entry displays very strong persistence that runs up to 4 years ahead. Lower entry during the financial crises therefore kept weighing on subsequent entry up to 4 years later. The relationship with past exit is also interesting. While estimated coefficients for the period up to 2013 are only marginally significant, they are consistently negative, meaning that increases in firm exits were followed by weaker entry throughout this period. These two pieces of evidence confirm the intuition developed above: At times of heightened uncertainty and depressed prospects, past entry developments are likely to weigh more on subsequent entry while large waves of exits are more likely to be associated with reduced entry down the road. The period after 2013, which as noted above, was arguably smoother, also shows some interesting patterns. First, gross entry is much less persistent than in the period running up to 2013, confirming that in a smoother environment, past entry developments matter less for subsequent entry.[11] Second, the sensitivity of cumulative entry to exit turns positive, particularly at longer

[11] It is true that this conclusion holds only for gross entry as the correlation between current gross entry and subsequent net entry actually increases in the period post-2013, especially at longer horizons, the difference reflecting the impact on subsequent exits.

horizons, suggesting that firms changed their behaviour relative to the previous period, for what exits mean for future new entrants.

Dependent variable	Cumulative Firm Gross Entry				Cumulative Firm Net Entry			
Yearly horizon	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Firm Entry	29.49[a]	24.01[a]	21.91[a]	24.37[a]	3.676[a]	3.606	2.091	0.429
up to 2013	*(4.356)*	*(4.238)*	*(5.359)*	*(7.063)*	*(0.970)*	*(2.393)*	*(2.764)*	*(2.169)*
Firm Entry	11.85[a]	-0.061	-4.875	-5.978	2.664[a]	-0.493	-4.084[b]	-7.189[a]
after 2013	*(4.229)*	*(3.743)*	*(4.348)*	*(5.726)*	*(0.873)*	*(1.553)*	*(1.861)*	*(1.890)*
Firm Exit	-5.774	-5.088	-4.756	-6.208	1.289	1.212	-0.076	-1.193
up to 2013	*(3.886)*	*(3.761)*	*(4.257)*	*(4.294)*	*(1.194)*	*(1.530)*	*(1.765)*	*(1.753)*
Firm Exit	-1.683	4.382	6.804[c]	6.507	-0.333	2.221	5.128[a]	6.231[a]
after 2013	*(3.410)*	*(3.092)*	*(3.529)*	*(4.446)*	*(0.771)*	*(1.394)*	*(1.835)*	*(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

Table 4: The dynamics of entry in industry and services. 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 $t+1$ and $t+h$, taken as a ratio of the overall number of firms in year t. 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.

Core vs. periphery countries Last, I split the sample between core and periphery countries, exploiting the unique feature of the Euro Area in which countries face similar shocks but differ markedly in their vulnerabilities to these shocks. In periphery countries, the recession that came with the European Sovereign Debt Crisis was much deeper. As a result, entry likely followed a very different dynamics than in core economies where the economic fallout of the crisis was much more limited, if any. Following on previous analysis, I therefore re-estimate the baseline specifications (11) and (12), allowing the coefficients of interest to differ for core (Austria, Belgium, Germany, France and the Netherlands) and periphery countries (Spain and Italy).

The empirical results in Table 5 show that the dynamics of entry in core and periphery countries markedly differ from one another. First, entry is 2 to 3 times more persistent in the periphery than in the core. When entry falls, the legacy is therefore felt for a longer time and to a larger extent in the periphery. Second, the impact of past exits on the subsequent dynamics of entry represents another striking difference between the core and the periphery. In the core, more exits are followed by significantly more entry, suggesting that potential new entrants see other firms' exits as an opportunity to start a profitable business. On the contrary, in the periphery, the correlation is opposite; more exits lead to lower subsequent entry. In this case, more exits seem to be interpreted mainly as signalling weaker prospects.

Dependent variable	**Cumulative Firm Gross Entry**				**Cumulative Firm Net Entry**			
Yearly horizon	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Firm Entry	13.86[a]	6.104[c]	4.980	6.813	2.033[b]	-0.477	-2.210	-2.817
core	*(4.108)*	*(3.698)*	*(4.257)*	*(6.350)*	*(0.871)*	*(1.840)*	*(2.241)*	*(1.838)*
Firm Entry	30.30[a]	14.51[b]	6.793	-2.349	5.676[a]	5.572[a]	0.852	-7.227[b]
periphery	*(6.718)*	*(6.417)*	*(7.763)*	*(8.930)*	*(1.573)*	*(2.624)*	*(3.169)*	*(3.591)*
Firm Exit	1.454	8.130[a]	10.38[a]	7.348[c]	1.349	4.174[a]	5.754[a]	4.688[a]
core	*(3.086)*	*(2.915)*	*(3.345)*	*(4.043)*	*(0.842)*	*(1.276)*	*(1.614)*	*(1.649)*
Firm Exit	-25.27[a]	-26.14[a]	-27.16[a]	-17.44[b]	-4.656[a]	-7.172[a]	-7.056[b]	-3.287
periphery	*(6.565)*	*(6.163)*	*(7.590)*	*(8.171*	*(1.532)*	*(2.327)*	*(2.834)*	*(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

Table 5: The dynamics of entry in the core and the periphery of the Euro Area. 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 $t+1$ and year $t+h$, taken as a ratio of the overall number of firms in year t. 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 t, both taken as a ratio of the overall number of firms in year t. 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.

Altogether, differences in the dynamics of entry between core and periphery countries suggest that the economic outlook could play a significant role in how entry responds to past entry and exit. Investigating further this intuition and the specific role of growth forecasts is therefore the focus of the next section.

4 The role of growth forecasts

4.1 The empirical specification

To explore how the economic outlook affects the dynamics of the entry, I extend the baseline specifications (11) and (12) to include the interaction terms between the current entry and exit rates and measures of expected future economic conditions. Denoting $\alpha_{ist}^{(h)}$ the sum of fixed effects, i.e. $\alpha_{ist}^{(h)} = \lambda_{it}^{(h)} + \mu_{is}^{(h)} + \nu_{st}^{(h)}$, the extended specification estimating cumulative gross entry then writes as:

$$\ln\left(\frac{c_{ist+h}^{g}}{1-c_{ist+h}^{g}}\right) = \left[\beta_{e,0}^{(h)} + \beta_{e,1}^{(h)}\,\mathbb{E}_t\,g_{it+j}\right]\ln\left(\frac{e_{ist}}{1-e_{ist}}\right)+\left[\beta_{x,0}^{(h)} + \beta_{x,1}^{(h)}\,\mathbb{E}_t\,g_{it+j}\right]\ln\left(\frac{x_{ist}}{1-x_{ist}}\right)+\alpha_{ist}^{(h)}+\varepsilon_{ist}^{(h)} \quad (14)$$

Similarly, the extended specification estimating cumulative net entry writes as:

$$\ln\left(\frac{1+c_{ist+h}^{n}}{1-c_{ist+h}^{n}}\right) = \left[\beta_{e,0}^{(h)} + \beta_{e,1}^{(h)}\,\mathbb{E}_t\,g_{it+j}\right]\ln\left(\frac{e_{ist}}{1-e_{ist}}\right)+\left[\beta_{x,0}^{(h)} + \beta_{x,1}^{(h)}\,\mathbb{E}_t\,g_{ct+j}\right]\ln\left(\frac{x_{ist}}{1-x_{ist}}\right)+\alpha_{ist}^{(h)}+\varepsilon_{ist}^{(h)} \quad (15)$$

In equations (14) and (15), $\mathbb{E}_t\,g_{it+j}$ denotes the expectation for GDP growth in country i between $t+j-1$ and $t+j$, conditional on the information set available in year t, while $\left\{\beta_{e,0}^{(h)};\beta_{e,1}^{(h)};\beta_{x,0}^{(h)};\beta_{x,1}^{(h)}\right\}$ are parameters to be estimated for different horizons h. The OECD economic outlook and the IMF World Economic Outlook databases provide conditional expectations for growth for three different horizons j. The first —$j = 0$— is the OECD or IMF real-time evaluation of current GDP growth. The second and the third —$j = 1$ and $j = 2$— are respectively the one and two year ahead OECD or IMF forecasts for GDP growth.[12,13] It is also important to note that the presence of country-time fixed effects $\lambda_{it}^{(h)}$ ensures that any direct impact of expected growth or any other macroeconomic variable on subsequent entry (gross or net) is typically filtered. Specifications (14) and (15) therefore allow to measure how the response of subsequent entry to changes in past entry or exit

[12]Both the OECD Economic outlook (OECD EO) and the IMF World Economic Outlook (IMF WEO) are published twice a year (June and December for the OECD EO and April and October for the IMF WEO). I use for each year the December issue of the OECD EO and the October issue of the IMF WEO to compute the corresponding real-time estimate and forecasts for GDP growth.

[13]The forecast horizon in the IMF WEO goes up to 5 years ahead, but only up to 2 years ahead in the OECD EO. I stick to the latter horizon to ensure comparability across both publications.

differs for different growth forecasts. Here, it is worth recalling that according to the comparative statics results derived above in section 2, estimated parameters should satisfy $\beta_{e,0}^{(h)} > 0 > \beta_{e,1}^{(h)}$ and $\beta_{x,0}^{(h)} < 0 < \beta_{x,1}^{(h)}$. That is, firm entry should exhibit some time dependence, but higher growth expectations should dampen this pattern, i.e. $\beta_{e,0}^{(h)} > 0 > \beta_{e,1}^{(h)}$. Conversely, firm entry should relate negatively to past firm exit, but again less so with higher growth expectations, i.e. $\beta_{x,0}^{(h)} < 0 < \beta_{x,1}^{(h)}$.

4.2 Forecasts and realisations: some statistics on growth.

Before diving into the empirical results of specifications (14) and (15), let us have a look at summary statistics for different measures of GDP growth, considering real-time, forecasts at different horizons and final estimations.

	Summary Statistics					**Correlation matrix**			
GDP Growth	Average	Std Dev.	1st quart.	median	3rd quart.	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

Table 6: OECD Economic Outlook GDP growth estimates. The first column 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.

Table 6 reports GDP estimates from the OECD Economic Outlook while Table 7 reports corresponding figures from the IMF World Economic Outlook. Both tables show that the distributions of GDP growth real-time and final estimates are very close to each other. The only visible difference is that real-time estimates display a slightly lower average and dispersion than final estimates for GDP growth. Such a similarity does not however extend to GDP growth forecasts. GDP growth forecasts are on average more optimistic than corresponding real-time and final estimates, especially the 1- to 2-year ahead forecast. Moreover their distribution is also significantly less dispersed, this mainly reflecting higher values for lower distribution quantiles. Interestingly the correlation of GDP growth forecasts with either real-time or final GDP growth estimates is rather low and ranges between 0.3 and 0.5. GDP growth forecasts and GDP growth realisations therefore provide different information.

	Summary Statistics					**Correlation matrix**			
GDP Growth	Aver.	Std Dev.	1st quart.	median	3rd quart.	Real-time	1-year ahead	1- to 2-year ahead	Final estimate
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

Table 7: IMF Economic Outlook GDP growth estimates. The first column 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.

4.3 The empirical results

I first estimate specifications (14) and (15) considering OECD forecasts for real GDP growth, over the 1- to 2-year ahead horizon, i.e. the expectation in year t of real GDP growth between $t+1$ and $t+2$.[14] Importantly, as notations in (14) and (15) show, growth forecasts correspond to the assessment of future GDP growth made at the time of the realisations of the explanatory entry and exit variables. As such, forecasts do not embed any forward information that could reflect the dependent variable.[15]

[14]Using instead the expectation in year t of real GDP growth between t and $t+1$ provides very similar results, available upon request.

[15]In this regard, the date-t expectation for real GDP growth between $t+1$ and $t+2$ ensures that the expectation variable is forward-looking relative to the dependent variable up to $t+2$. However from $t+3$

Table 8 provides the empirical results for the estimation of specifications (14) and (15) using GDP growth forecasts from the OECD Economic Outlook. The main takeaway is that growth forecasts have a significant impact on the dynamics of entry. This is visible along two dimensions. First, growth forecasts affect the persistence of entry. Past entry realisations affect subsequent entry but to a lesser extent when the economy is expected to grow faster. To give a sense of the magnitudes involved, a one percentage point drop in entry cuts cumulative gross entry after 2 years by 0.7 percentage point when GDP is expected to remain flat. In contrast, the same reduction in past entry has virtually no impact on subsequent cumulative gross entry after two years when GDP is expected to grow at 2%.

Dependent variable	**Cumulative Firm Gross Entry**				**Cumulative Firm Net Entry**			
Yearly horizon	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Firm Entry	44.74[a]	37.82[a]	35.82[a]	42.78[a]	5.997[a]	6.919[a]	4.542[c]	5.186[c]
	(5.674)	*(5.355)*	*(6.860)*	*(8.188)*	*(1.249)*	*(2.129)*	*(2.713)*	*(2.792)*
Firm Entry ×	30.30[a]	14.51[b]	6.793	-2.349	5.676[a]	5.572[a]	0.852	-7.227[b]
GDP growth forecast	*(6.718)*	*(6.417)*	*(7.763)*	*(8.930)*	*(1.573)*	*(2.624)*	*(3.169)*	*(3.591)*
Firm Exit	1.454	8.130[a]	10.38[a]	7.348[c]	1.349	4.174[a]	5.754[a]	4.688[a]
	(3.086)	*(2.915)*	*(3.345)*	*(4.043)*	*(0.842)*	*(1.276)*	*(1.614)*	*(1.649)*
Firm Exit ×	-25.27[a]	-26.14[a]	-27.16[a]	-17.44[b]	-4.656[a]	-7.172[a]	-7.056[b]	-3.287
GDP growth forecast	*(6.565)*	*(6.163)*	*(7.590)*	*(8.171*	*(1.532)*	*(2.327)*	*(2.834)*	*(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

Table 8: Growth forecasts and the dynamics of entry: The case of OECD projections. 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 $t + 1$ and year $t + h$, taken as a ratio of the overall number of firms in year t. 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 t, both taken as a ratio of the overall number of firms in year t, 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.

Second, growth forecasts affect the relationship between exit and subsequent entry: when GDP growth forecasts are low, an increase in past exit is associated with a significant

onward, the forecast variable becomes partly backward-looking relative to the dependent variable, which embeds information that comes after $t + 2$.

drop in subsequent cumulative entry (both in gross and net terms). By contrast, when GDP growth forecasts are high, an increase in past exit is followed by an increase in subsequent cumulative entry (again, both in gross and net terms). Based on the parameters estimates, the threshold for GDP growth forecast above which the impact of past exit on subsequent gross entry turns from negative to positive ranges between 1.40 and 1.65. Comparing these figures with those for the median value of GDP growth forecasts —about 1.62%— suggests that in more than half the sample observations, the relationship between current exit and subsequent entry was actually positive.

Dependent variable	**Cumulative Firm Gross Entry**				**Cumulative Firm Net Entry**			
Yearly horizon	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Firm Entry	46.75[a]	41.56[a]	42.06[a]	36.97[a]	7.193[a]	8.419[a]	8.187[a]	3.191
	(6.177)	*(5.522)*	*(6.948)*	*(8.291)*	*(1.221)*	*(1.917)*	*(2.640)*	*(2.969)*
Firm Entry ×	-18.90[a]	14.51[b]	6.793	-2.349	5.676[a]	5.572[a]	0.852	-7.227[b]
GDP growth forecast	*(6.718)*	*(6.417)*	*(7.763)*	*(8.930)*	*(1.573)*	*(2.624)*	*(3.169)*	*(3.591)*
Firm Exit	1.454	8.130[a]	10.38[a]	7.348[c]	1.349	4.174[a]	5.754[a]	4.688[a]
	(3.086)	*(2.915)*	*(3.345)*	*(4.043)*	*(0.842)*	*(1.276)*	*(1.614)*	*(1.649)*
Firm Exit ×	-25.27[a]	-26.14[a]	-27.16[a]	-17.44[b]	-4.656[a]	-7.172[a]	-7.056[b]	-3.287
GDP growth forecast	*(6.565)*	*(6.163)*	*(7.590)*	*(8.171*	*(1.532)*	*(2.327)*	*(2.834)*	*(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

Table 9: Growth forecasts and the dynamics of entry: The case of IMF projections. 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 $t + 1$ and year $t + h$, taken as a ratio of the overall number of firms in year t. 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 t, both taken as a ratio of the overall number of firms in year t, and their respective interactions with 1- to 2-year ahead GDP growth IMF 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.

Using instead growth forecasts from the IMF World Economic Outlook, provides very consistent results (see Table 9). Cumulative gross and net entry both depend positively on past entry but less so when the economy is expected to grow more strongly. Similarly, more firm exits are followed by less entry subsequently when the economy is expected to grow weakly, while strong growth expectations lead more firms to enter in response to an increase in past exits.[16]

To get a sense of the impact of growth forecasts on the forward path of entry, I simulate in Figure 4 the effect of a combined one percentage point decrease in entry and a one percentage point increase in exit, on the subsequent dynamics of gross and net entry, considering two scenarios.[17] In the first scenario, GDP growth forecasts are set at 2.1%, which corresponds to the 90$^{\text{th}}$ percentile of the sample distribution (blue lines) while in the second scenario, GDP growth forecasts are set at 0.9%, which corresponds to the 10$^{\text{th}}$ percentile of the sample distribution (red lines).

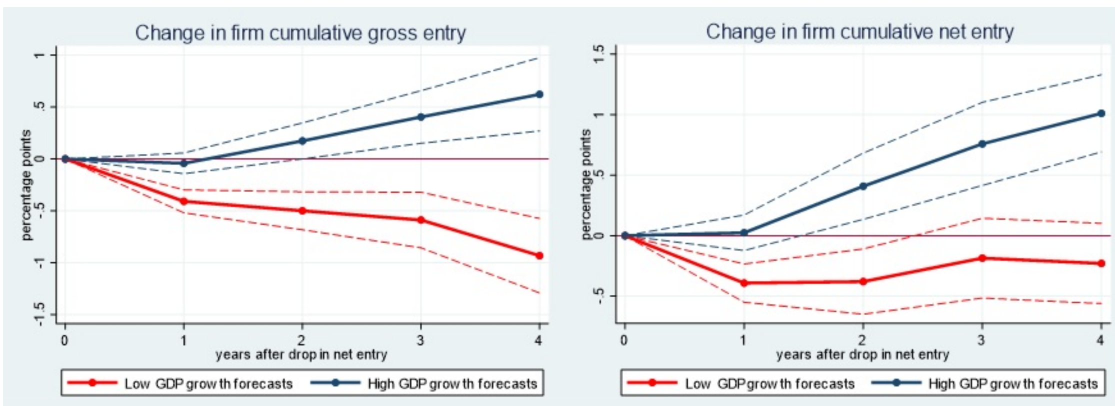

Figure 4: Growth expectations and the dynamics of entry. The blue line (red line) in the left-hand panel represents the change in percentage point in the cumulative gross entry rate following a one percentage point increase in the gross exit rate and one percentage decrease in the gross entry rate when 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, when growth forecasts are low, gross and net entry both fall significantly in response to higher exit and lower entry. But when growth forecasts are high, both gross and net entry are subsequently flat. Then, as the horizon lengthens, differences in growth forecasts make a larger difference to subsequent entry. For instance after two years,

[16] Regression results based on OECD vs. IMF forecasts otherwise show two minor differences: One is that the impact of IMF forecasts on the dynamics of gross entry is stable as the horizon lengthens, while that of OECD forecasts is growing over time. Another difference is that the threshold level for GDP growth forecasts above which the relationship between exit and subsequent entry turns positive, is slightly higher for OECD than for IMF forecasts.

[17] Such simulations and the next are based on regression results using OECD Economic Outlook GDP growth forecasts.

strong growth forecasts are associated with significantly higher gross and net entry, while weak growth forecasts are followed by significantly lower gross and net entry. Further into the future, cumulative entry (in gross and in net terms) keep increasing over time, with strong growth forecasts. On the contrary, with weak growth forecasts, cumulative entry is either flat (in the case of net entry) or keeps falling (in the case of gross entry). After four years, the difference in cumulative entry between the two growth scenarios is sizeable and amounts to about 1.5 percentage points in the case of gross entry and more than 1 percentage point in the case on net entry.

Another way to assess the importance of growth expectations for the dynamics of entry is to compute the growth expectation needed for subsequent cumulative entry to increase by the same amount as a combined increase in exit and decrease in entry. Figure 5 shows that growth forecasts need to be unrealistically large (around 8%) for subsequent entry (either in gross or in net terms) to match a combined increase in exit and decrease in entry, just within one year. However, this figure drops significantly after 2 years, almost by half. And after 4 years, the increase in cumulative entry matches the combined initial increase in exit and drop in entry for GDP growth forecasts of about 3%.

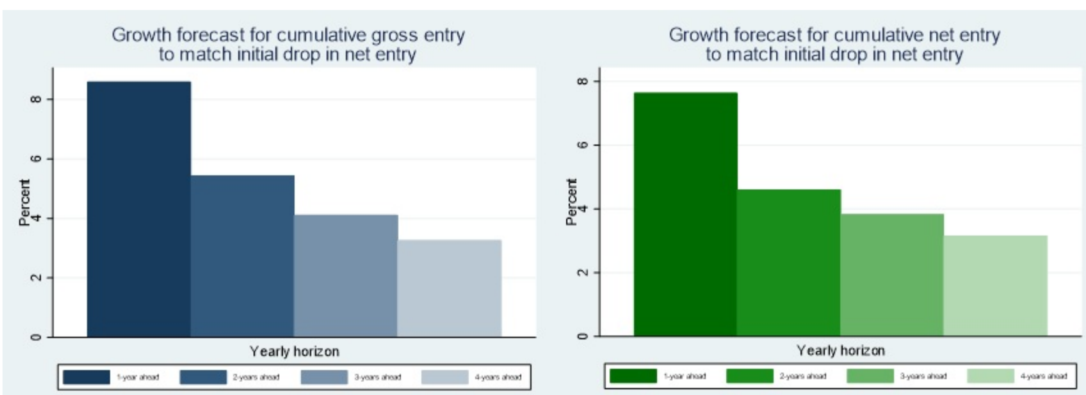

Figure 5: With strong growth forecasts, entry can make up for past losses. The blue bars in the left-hand panel (green bars in the right-hand panel) represent the 1-to 2-year ahead GDP growth forecast needed for cumulative gross entry (cumulative net entry) to compensate a one percentage point increase in gross exit rate and a one percentage point decrease in gross entry rates, at different yearly horizons. GDP growth forecasts figures are computed based on estimated coefficients reported in Table 8.

The conclusion is therefore twofold. On the one hand, expected growth makes a significant difference to the dynamics of entry, both in gross and net terms, with strong growth expectations reducing time persistence in entry while turning the impact of exits from negative to positive. On the other hand, with strong growth expectations, an initial increase in exit and decrease in entry lead to a subsequent increase in entry that is comparable in size to the initial impulse.

4.4 How robust is the impact of growth forecasts on the dynamics of entry?

In this section, I investigate potential alternative mechanisms that could account for the impact of growth forecasts on the dynamics of entry. I do so in three steps. First, I study the impact of current as opposed to expected economic conditions. After all, the outlook may look strong when the economy is already doing well. The impact of growth expectations on the dynamics of entry may therefore simply reflect that of current growth conditions. Second, I study the impact of regulations. Business regulations are a primary driver of firm entry and exit. As such, they can affect the dynamics of entry, either through the existence of different types of barriers to entry, or through the quality of insolvency regimes that affect the exit margin. In each case, they are likely to have a significant impact on how entry responds to past developments in entry and exit. Last, firm entry is likely to depend on firms' ability to raise funding. Hence, the impact of growth forecasts may simply reflect changes in firms' (in)ability to raise funding to finance entry.

4.4.1 Current vs. expected growth

To determine which of current or expected growth matters for the dynamics of entry, I focus the analysis on 1- and 2-year ahead cumulative entry —as dependent variables—, in either gross or net terms. Given that I use the 1 to 2-year ahead GDP growth forecast, focusing the analysis on these variables ensures that the relationship between entry decisions and growth forecasts is purely forward-looking, i.e. entry relates to future expected growth that is yet to come. Conversely, the relationship, if any, between entry decisions and current GDP growth would be purely backward-looking, i.e. entry would relate to past, realised GDP growth. Moreover, for the sake of comprehensiveness, I run the horse race between current and expected GDP growth, taken either from the OECD Economic Outlook or from the IMF World Economic Outlook.

Dependent variable	**Cumulative Firm Gross Entry**				**Cumulative Firm Net Entry**			
Yearly horizon	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Forecasts	OECD		IMF		OECD		IMF	
Firm Entry	40.39[a]	30.57[a]	41.39[a]	32.85[a]	5.770[a]	6.186[a]	7.017[a]	7.873[a]
	(6.184)	*(5.568)*	*(6.715)*	*(6.198)*	*(1.351)*	*(2.063)*	*(1.404)*	*(2.327)*
Firm Entry ×	-13.14[a]	-11.92[a]	-14.34[a]	-14.46[a]	-1.732[b]	-3.058[b]	-2.624[a]	-4.369[b]
GDP growth forecast	*(3.591)*	*(3.105)*	*(4.242)*	*(4.179)*	*(0.781)*	*(1.321)*	*(0.962)*	*(2.161)*
Firm Entry ×	-2.496[c]	-3.80[a]	-2.239[a]	-3.324[c]	-0.200	-0.367	-0.073	-0.210
current GDP growth	*(1.351)*	*(1.046)*	*(1.271)*	*(1.116)*	*(0.249)*	*(0.577)*	*(0.264)*	*(0.638)*
Firm Exit	-23.07[a]	-13.80[b]	-24.81[a]	-13.00	-4.717[a]	-7.847[a]	-6.401[a]	-10.42[a]
	(7.818)	*(7.040)*	*(9.356)*	*(7.917)*	*(1.522)*	*(2.686)*	*(1.718)*	*(3.393)*
Firm Exit ×	13.01[a]	8.897[b]	14.57[b]	9.211[c]	2.976[a]	5.984[a]	4.300[a]	8.406[a]
GDP growth forecast	*(4.805)*	*(4.101)*	*(6.086)*	*(5.554)*	*(0.879)*	*(1.591)*	*(1.268)*	*(2.583)*
Firm Exit ×	0.039	1.582	-0.428	1.430	0.412	0.0209	0.101	-0.474
current GDP growth	*(1.403)*	*(1.136)*	*(1.458)*	*(1.245)*	*(0.315)*	*(0.557)*	*(0.356)*	*(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

Table 10: The impact of current and expected growth on the dynamics of entry. 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 $t+1$ and year $t+h$, taken as a ratio of the overall number of firms in year t. 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 t, both taken as a ratio of the overall number of firms in year t, 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.

In a nutshell, the empirical evidence in Table 10 shows that current GDP growth can affect the dynamics of subsequent entry, but this impact is usually superseded by that of GDP growth forecasts. For instance, regressions in the two first columns, which use OECD estimates for current for future GDP growth, show that GDP growth, both current and forecast, reduce the impact of current entry on subsequent gross entry, even if estimated coefficients show that GDP growth forecasts are quantitatively three times more important than current GDP growth.

The relationship between exit and subsequent entry shows a more striking difference in the respective impacts of current and future GDP growth. While growth expectations do affect the response of gross entry to past exits, current GDP growth has no impact whatsoever. There is no evidence that firm entry's response to past exits differs in times of high vs. low growth. Estimated coefficients are both qualitatively insignificant and quantitatively close to zero.

The third and fourth columns which make use of IMF instead of OECD estimates for current and future GDP growth, provide very similar results. With high current GDP growth or high GDP growth forecasts, past entry developments weigh less on subsequent gross entry, even if again, the impact of growth forecasts is one order of magnitude larger than the impact of current GDP growth. In contrast, the response of entry to past exit depends positively and significantly on GDP growth forecasts, while current GDP growth plays again no role.

The four last columns in Table 10 provide estimations results when the dependent variable is cumulative net entry. The difference between growth forecasts and current growth also appears very strikingly. If growth forecasts affect the dynamics of net entry as previously, by making it less responsive to past entry but more responsive to past exits, none of the four different regressions provides any evidence that current GDP growth has any discernible effect of the same type. Neither the sensitivity of net entry to past entry nor the sensitivity of net entry to past exit, seem to depend on current GDP growth. This result about net entry suggests that gross entry *and* gross exit respond to changes in growth expectations rather than changes in current growth, in their relationship to past entry and exit. This would explain why the results for *net* entry are even more striking than those for *gross* entry.

4.4.2 The quality of insolvency frameworks

Having established that the dynamics of entry depends on *expected* rather than *current* GDP growth, I now extend the investigation to study the possible impact of structural factors. I list three which could potentially play out: first regulations affecting the quality of insolvency regimes, second, indicators capturing firms' ability to raise funding and last, regulations limiting firm entry.

First regulations that govern firm exit, in particular insolvency regimes are likely to affect the dynamics of firm entry and growth (see for instance McGowan and Andrews (2016)). This is most obvious as laws regulating firm exit are likely to shape how entry responds to past exits. For instance, when insolvency is costly, potential new firms may hesitate to replace exiting ones, fearing that failure may in turn be very costly. But such regulations could also affect how current entry affects subsequent entry. A drop in past entry would for example weigh less on new entry subsequently if potential new entrants expect exit to be easier or more fluid.

To test for these intuitions, I focus the analysis on four different indicators for the quality of insolvency procedures (Table 11). First, the cost of insolvency, i.e. the pecuniary cost of declaring insolvency, plays a significant role in the dynamics of entry. A higher cost of insolvency typically increases the persistence of entry, making past entry developments more important for subsequent gross and net entry (first and fifth columns).

Yet, in both cases, this impact comes in addition to that of growth forecasts. Moreover, from a quantitative standpoint, growth forecasts still have a significantly larger impact than insolvency costs. Considering for instance a fall in past entry, then a one standard deviation increase in growth forecasts cuts the drop in subsequent cumulative entry by two thirds relative to the case of average growth forecasts and average insolvency costs. Conversely a one standard deviation drop in insolvency costs only cuts the drop in subsequent cumulative entry by about 45% relative to the same average benchmark. Second, recovery rates, i.e. how many cents on the euro, creditors are able to recoup from failing firms, also affect the dynamics of entry, although only at the margin (second and sixth columns). A higher recovery rate does indeed reduce the persistence of gross entry, making past entry less important for subsequent entry. However this effect is only marginally significant and recovery rates play no role in the relationship between current exit and subsequent entry, neither in gross nor in net terms. A similar result holds for the variable measuring the extent to which creditors are involved in a firm's insolvency process (third and seventh columns). A stronger involvement of creditors typically makes entry less persistent but barely affects how entry relates to past exit. Last, the time it takes for creditors to recover their assets play little role in the dynamics of gross entry. But paradoxically, a longer time makes net entry more responsive to past exit (last column in Table 11), possibly because a more drawn-out process makes exit less persistent.

Dependent variable	**2-year ahead Cumulative Firm Gross Entry**				**2-year ahead Cumulative Firm Net Entry**			
Insolvency indicator	Insolvency Cost	Recovery rate	Creditor partic.	Recovery time	Insolvency Cost	Recovery rate	Creditor partic.	Recovery time
Firm Entry	29.95[a]	67.11[a]	95.03[a]	41.49[a]	5.213[a]	11.58	14.01	5.279
	(7.575)	*(13.68)*	*(26.28)*	*(14.27)*	*(2.713)*	*(9.836)*	*(14.26)*	*(7.631)*
Firm Entry × *Growth forecast*	-16.83[a]	-18.10[a]	-17.84[a]	-17.45[a]	-2.418[b]	-2.997[a]	-2.988[a]	-3.219[a]
	(2.854)	*(2.786)*	*(2.844)*	*(2.860)*	*(0.956)*	*(0.940)*	*(0.975)*	*(0.987)*
Firm Entry × *Insolvency index*	0.812[c]	-0.392[b]	-21.39[b]	-3.361	-0.067	-0.090	-3.306	-0.076
	(0.469)	*(0.163)*	*(9.084)*	*(8.773)*	*(0.159)*	*(0.112)*	*(5.489)*	*(6.180)*
Firm Exit	-13.18	-38.88[b]	-13.56	-14.81	-6.185[b]	0.487	-49.13[a]	-24.27
	(8.056)	*(18.44)*	*(34.47)*	*(14.35)*	*(2.912)*	*(8.810)*	*(14.93)*	*(5.740)*
Firm Exit × *Growth forecast*	15.68[a]	14.99[a]	15.19[a]	14.89[a]	7.253[a]	7.179[a]	7.964[a]	8.378[a]
	(3.977)	*(4.057)*	*(4.086)*	*(4.116)*	*(1.426)*	*(1.389)*	*(1.411)*	*(1.464)*
Firm Exit × *Insolvency index*	-0.980[b]	0.245	-2.806	-4.067	-0.257[c]	-0.108	15.12[a]	11.35[a]
	(0.392)	*(0.202)*	*(12.69)*	*(9.921)*	*(0.133)*	*(0.107)*	*(5.773)*	*(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

Table 11: Insolvency frameworks and the dynamics of firm entry. 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. **Insolvency cost** 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. **Recovery Time** 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.

4.4.3 Firms' ability to raise funding

In addition to the quality of insolvency frameworks, the ability to raise funding is also likely to affect firms' decisions to enter. While future prospects are undoubtedly a critical element of how firms assess profits they could earn when starting a new business, the ability to raise enough funding at a reasonable cost is another important input in this assessment. Moreover, most new firms tend to be small and lack the capital needed to operate on a sufficiently large scale, while growth in the first years after entry, heavily depends on the ability to raise funding (see Aghion et al. (2007)). To explore the impact of firms' ability to raise funding, I consider three set of variables and investigate the extent to which, each of them affects the dynamics of entry. First, I look into the design of collateral and bankruptcy laws and the extent to which they are meant to facilitate firms' access to credit. Second, I explore whether differences in credit levels or credit growth affect the dynamics of entry, focusing on credit to the corporate sector as a share of GDP. Third and last, I look into whether funding costs matter for the dynamics of entry, focusing on real government bond yields and changes in credit standards. For the former, I focus on the 5-year real government bond yield —corporate debt being usually of comparable maturity—. For the latter, I focus on supply-driven changes in lending standards applied by banks on loans to firms. The empirical evidence in (Table 12) shows that firms' ability to obtain credit affects the dynamics of entry to some extent: easier access to credit tends for instance to reduce the persistence of entry. However, there is no empirical evidence that access to credit affects the response of entry to past exit. More specifically, the first five columns in Table 12) show that easier and cheaper access to credit for firms makes past entry less important for subsequent gross entry.

This is true of all variables, except for the indicator for growth in credit to the non-financial sector to GDP. For example, when the design of collateral and bankruptcy laws facilitates access to credit for firms, then gross entry is less persistent. Similarly, when real funding costs are lower, or when banks ease credit standards applied to firms, then gross entry also shows less persistence. Conversely, indicators for firms' ability to obtain credit have much less impact on how gross entry responds to past exits. Only one indicator —the funding cost indicator— out of five, shows a (weakly) statistically significant effect, the relationship between exit and subsequent entry being negative when funding costs are high and positive when funding costs are low.

Turning to the dynamics of net entry, the last five columns in (Table 12) provide only weak evidence for an impact of firms' ability to obtain credit. High credit to GDP levels and strong growth in credit to GDP increase somewhat the sensitivity of net entry to past exit. But other indicators do not show any similar effect, and none seems to affect how gross entry affects subsequent net entry.[18]

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

Table 12: Credit and the dynamics of firm entry. 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** refers to the log of current credit to the private non-financial sector to GDP. **Credit 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.

[18] It is true that the variable capturing the extent to which the design of collateral and bankrutpcy laws facilitates access to credit enters the regression with a coefficient that is marginally significant. However, the positive coefficient is unexpected as higher readings for this indicator are associated with a better access to credit for firms. Past entry should therefore weigh less, not more, on subsequent net entry.

4.4.4 Regulations affecting entry

Last, regulations that govern firm entry, in particular laws that limit entry or make it difficult, are very likely to affect the dynamics of entry (see for instance Klapper et al. (2004)). I consider in turn, four indicators that capture different aspects of the extent to which firms face barriers to entry. First, I focus on the cost to start a new business —expressed in percent of GDP per capita, a higher cost being typically associated with stronger barrier to entry. Similarly, I consider the amount of paid-in capital, which indicates the minimal amount of paid-in capital needed to start a new business. Here again, higher readings are associated with stronger barriers to entry. Third, I investigate the impact of the number of procedures to start a new business on the dynamics of entry. Last, I look into the effect of the number of days to start a new business.

Empirical results in Table 13 confirm that barriers to entry have a significant impact on the dynamics of entry. For instance, consistent with a simple intuition, a drop in current entry typically weighs more on subsequent entry, both in gross and net terms, when barriers to entry are high (third row in (Table 13)). On the contrary, when barriers to entry are low, past entry developments matter less for subsequent entry. High barriers to entry also imply that an increase in exits is more likely to be followed by a drop in entry (last row in (Table 13)). This is particularly true of the variables indicating the cost and the time it takes to start a new business. Long and costly start-up procedures are typically associated with a negative relationship between exit and subsequent entry, both in gross and net terms. Conversely, when start-up procedures are short and inexpensive, an increase in exit is more likely to be followed by a subsequent increase in entry. Last, Table 13 shows that none of the indicators capturing the extent to which firms face barriers to entry affects how the economic outlook affects the dynamics of entry. Throughout the different regressions, a brighter outlook is consistently associated with a significantly lower degree of persistence in entry, while more exists are more likely to be followed by more entry.

Dependent variable	2-year ahead Cumulative Firm Gross Entry				2-year ahead Cumulative Firm Net Entry			
Entry index	Cost	Paid-in capital	Proce-dures	Time	Cost	Paid-in capital	Proce-dures	Time
Firm Entry	19.89[a]	35.90[a]	-5.246	19.63[a]	-0.784	4.281b	-3.715	1.516
	(6.304)	*(5.524)*	*(9.330)*	*(6.053)*	*(3.032)*	*(2.148)*	*(3.929)*	*(2.589)*
Firm Entry × *Growth forecast*	-13.03[a]	-18.52[a]	-12.70[a]	-13.21[a]	-1.527	-3.769[a]	-2.066[b]	-2.297[b]
	(2.741)	*(2.930)*	*(2.906)*	*(2.799)*	*(0.988)*	*(1.010)*	*(0.971)*	*(0.944)*
Firm Entry × *Entry indicator*	1.731[a]	0.157	5.568[a]	0.782[a]	0.539[a]	0.100[b]	1.062[a]	0.134[a]
	(0.387)	*(0.109)*	*(1.036)*	*(0.110)*	*(0.180)*	*(0.0474)*	*(0.361)*	*(0.0433)*
Firm Exit	6.640	-17.91[b]	-14.35[c]	-10.55	1.223	-8.655[a]	-5.186	-5.651[b]
	(8.181)	*(7.128)*	*(8.594)*	*(7.417)*	*(3.758)*	*(2.562)*	*(3.246)*	*(2.735)*
Firm Exit × *Growth forecast*	7.833[b]	15.85[a]	13.59[a]	13.27[a]	4.861[a]	9.646[a]	6.992[a]	6.904[a]
	(3.907)	*(4.182)*	*(3.881)*	*(3.870)*	*(1.427)*	*(1.587)*	*(1.337)*	*(1.315)*
Firm Exit × *Entry indicator*	-2.323[a]	-0.126	-0.472	-0.461[a]	-0.916[a]	-0.186[a]	-0.454	-0.148[b]
	(0.481)	*(0.123)*	*(0.890)*	*(0.133)*	*(0.245)*	*(0.062)*	*(0.328)*	*(0.065)*
Observations	4,663	4,096	3,530	2,954	4,627	4,049	3,484	2,914
R-squared	0.920	0.946	0.920	0.946	0.640	0.748	0.639	0.746

Table 13: Entry regulations and the dynamics of firm entry. 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.

4.4.5 Which GDP component matters for the dynamics of entry?

Having established that growth forecasts matter for the dynamics of entry, beyond and above current GDP growth and structural factors, I now ask which GDP components matter most. Is private consumption, as the largest GDP component, the main driver? Or could other components, like net exports, be more important, especially as countries covered in this analysis are small open economies? To answer this question, I focus on the contributions of the different GDP components and test which one matters for the dynamics of entry.[19] Empirical results in Table14 provide three main takeaways.

Dependent variable	Cumulative Firm Gross Entry				Cumulative Firm Net Entry			
Yearly horizon	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Firm Entry	41.94[a]	28.69[a]	22.47[b]	31.48[a]	6.339[a]	3.701	-1.639	2.624
	(7.295)	*(6.984)*	*(9.442)*	*(11.30)*	*(1.582)*	*(3.162)*	*(4.133)*	*(4.243)*
× *Private Consumption*	-13.05[b]	-9.724[c]	-3.526	-14.20[b]	-2.305	0.558	-0.458	-1.400
	(6.073)	*(5.424)*	*(6.219)*	*(7.186)*	*(1.464)*	*(2.049)*	*(2.649)*	*(2.869)*
× *Private Investment*	-17.74[a]	-15.97[a]	-22.52[a]	-25.36[a]	-1.303	-3.050	-0.989	-8.285[a]
	(6.668)	*(6.044)*	*(7.644)*	*(9.729)*	*(1.423)*	*(2.063)*	*(2.690)*	*(3.202)*
× *Public Investment*	-83.18[a]	-91.91[a]	-100.9[a]	-108.0[a]	-1.934	-6.217	-14.19[b]	-13.07[c]
	(15.33)	*(14.37)*	*(17.48)*	*(26.65)*	*(3.638)*	*(5.362)*	*(6.578)*	*(7.497)*
Firm Exit	-24.14[a]	-9.614	-11.95	-22.83[b]	-4.594[a]	-2.590	-2.993	-9.288[c]
	(8.295)	*(8.040)*	*(9.515)*	*(11.35)*	*(1.656)*	*(3.126)*	*(4.572)*	*(4.789)*
× *Private Consumption*	14.15[c]	8.622	7.426	17.48[b]	5.001[a]	3.145	2.167	6.666[b]
	(7.260)	*(6.261)*	*(6.825)*	*(8.182)*	*(1.805)*	*(2.495)*	*(3.151)*	*(2.959)*
× *Private Investment*	16.63[b]	11.54[c]	17.25[b]	15.56	3.181[c]	6.244[a]	9.846[a]	11.07[a]
	(7.606)	*(6.698)*	*(7.695)*	*(9.740)*	*(1.666)*	*(2.396)*	*(3.160)*	*(3.631)*
× *Public Investment*	75.39[a]	66.62[a]	77.74[a]	79.40[a]	10.65[c]	12.81[c]	20.94[b]	31.04[a]
	(20.53)	*(18.37)*	*(23.10)*	*(22.41)*	*(5.773)*	*(7.736)*	*(8.763)*	*(9.052)*
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

Table 14: Decomposing growth forecasts along GDP components. 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 $t + 1$ and year $t + h$, taken as a ratio of the overall number of firms in year t. 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 t, both taken as a ratio of the overall number of firms in year t, 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 interaction terms between firm entry and exit on the one hand and expectations of public consumption and net exports on the other hand, as well as 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.

First, persistence in gross entry mainly depends (negatively) on the contributions of public and private investment to future GDP growth. Both components show consistently negative coefficients (rows 4 and 5 in the first four columns), implying that stronger

[19]Writing GDP, Y, as the sum of private consumption C_p, public consumption, C_g, private investment I_p, public investment I_g and net exports NX: $Y = C_p + C_g + I_p + I_g + NX$. GDP growth forecasts can then be decomposed as the sum of the respective GDP components contributions and a horse race test can be run among the different components

contributions of private or public investment to future expected GDP growth imply that current entry weighs less on subsequent entry. From a quantitative standpoint, the impact of a one standard deviation increase in the contribution of public investment is about two times larger than that of a one standard deviation increase in the contribution of private investment, at a 2-year horizon (see below). Looking at the other GDP components, private consumption also has a similar impact to that of public and private investment, although statistical significance is weaker, while public consumption and net exports do not seem to play any role.

Second, public investment is the GDP component whose expected contribution to growth has the most significant and consistent impact on the sensitivity of entry to past exit. Higher contributions of public investment are systematically associated with a stronger positive response of subsequent entry to an increase in past exit. To be sure, the contribution of private investment also matters. It is however only weakly significant and its impact is quantitatively smaller.

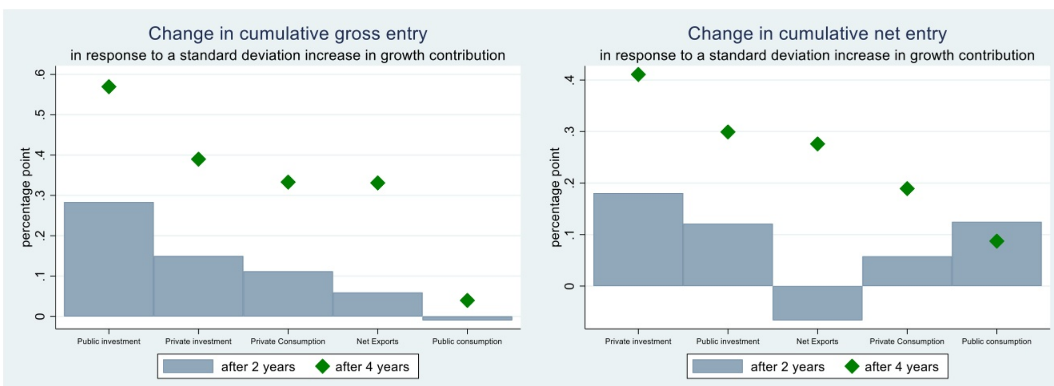

Figure 6: Public and private investment matter most for the dynamics of entry. The blue bars (green diamonds) in the left-hand panel represent the relative change in cumulative gross entry after 2 years (after 4 years) in response to a combined one percentage point increase in exit and a one percentage 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.

Third and last, empirical results for net entry partly confirm those obtained in the case of gross entry. In particular, a stronger contribution of public or private investment to future GDP growth still raises the sensitivity of net entry to past exit. That said, unlike in the case of gross entry, a stronger contribution of public consumption to future GDP growth also reduces the impact of gross entry on subsequent net entry.

Figure 6 provides estimates for the difference-in-difference effect for each GDP component and confirms that contributions of public and private investment to expected GDP growth have the largest impact on entry. The left-hand panel shows that entry increases by an additional 0.3 percentage point after 2 years in response to a combined one percentage point drop in past entry and a one percentage point increase in past exit, when the contribution of public investment to expected GDP growth increases by one standard deviation. By contrast, when the contribution of public consumption to expected GDP growth increases by one standard deviation, then entry barely moves in response to a combined one percentage point drop in past entry and a one percentage point increase in past exit. Similarly, the right-hand panel shows that net entry increases by an additional 0.4 percentage point after 4 years in response to a combined one percentage point drop in past entry and a one percentage point increase in past exit, when the contribution of private investment to expected GDP growth increases by one standard deviation. But again, when the contribution of public consumption to expected GDP growth increases by one standard deviation, then net entry increases by only 0.1 percentage point higher after four years, in response to a combined one percentage point drop in past entry and a one percentage point increase in past exit.

5 Conclusions

Understanding the dynamics of firm entry and how it relates to past entry and exit developments is of crucial importance for policymakers, particularly when deep recessions that hit businesses hard, call for extending wide and far-reaching policy support. Based on the experience of Euro Area countries, my empirical investigation into the dynamics of firm entry provides two main conclusions. First, growth forecasts matter for the dynamics of entry. Expectations of strong GDP growth typically make current entry developments less important for subsequent entry, while an increase in past entry is typically more likely to be followed by higher entry. Moreover, the impact of growth expectations on the dynamics of entry comes above and beyond that of other factors that could affect firms' decision to enter. This includes current economic conditions, structural factors that shape the quality of insolvency regimes, the presence of barriers to entry, or the ability or difficulty for firms to obtain credit. Second, decomposing growth forecasts across the different GDP components shows that private and public investment are the two components that drive the impact of growth expectations on the dynamics of entry.

This last observation suggests two concluding remarks. First, the result on private investment implies that economies can face self-reinforcing developments as low expectations of private investment could deter entry, which would, in turn, weaken private investment down the road. Conversely, expectations of rapidly expanding private investment could help jump-start firm entry which by itself would contribute to strengthen the outlook for private investment. Second, public investment, unlike public consumption, can play a specific role in igniting this virtuous circle between private investment expectations and entry, by making entry more responsive to past exits. Governments can hence play a key role in fostering business dynamism, not only by promoting structural reforms, but also by shifting to a more growth-friendly composition of expenditures that puts a premium on public investment.

References

AGHION, P., T. FALLY, AND S. SCARPETTA (2007): "Credit constraints as a barrier to the entry and post-entry growth of firms," *Economic Policy*, 22, 732–59.

ANDREWS, D., A. CHARLTON, AND A. MOORE (2021): "COVID-19, productivity and reallocation: Timely evidence from three OECD countries," *OECD Economics Department Working Paper*.

ASTURIAS, J., S. HUR, T. J. KEHOE, AND K. J. RUHL (2023): "Firm Entry and Exit and Aggregate Growth," *American Economic Journal: Macroeconomics*, 15, 48–105.

BARLEVY, G. (2003): "Credit market frictions and the allocation of resources over the business cycle," *Journal of Monetary Economics*, 50, 1795–1818.

Bettendorf, L., D. Freeman, and Y. Adema (2021): "Covid-19 support distorted the process of creative destruction in the Netherlands," *VoxEu.org*.

Bilbiie, F. O., F. Ghironi, and M. J. Melitz (2012): "Endogenous Entry, Product Variety, and Business Cycles," *Journal of Political Economy*, 120, 304–345.

Caballero, R. J. and M. L. Hammour (1994): "The Cleansing Effect of Recessions," *The American Economic Review*, 84, 1350–1368.

Campbell, J. R. and H. A. Hopenhayn (2005): "Market Size Matters," *The Journal of Industrial Economics*, 53, 1–25.

Cavallari, L., S. Romano, and P. Naticchioni (2021): "The original sin: Firms' dynamics and the life-cycle consequences of economic conditions at birth," *European Economic Review*, 138.

Clementi, G. L. and B. Palazzo (2016): "Entry, Exit, Firm Dynamics, and Aggregate Fluctuations," *American Economic Journal: Macroeconomics*, 8, 1–41.

Cook, D. (2001): "Time to enter and business cycles," *Journal of Economic Dynamics and Control*, 25, 1241–1261.

Crane, L. D., R. A. Decker, A. Flaaen, A. Hamins-Puertolas, and C. Kurz (2022): "Business exit during the COVID-19 pandemic: Non-traditional measures in historical context," *Journal of Macroeconomics*, 72.

Egert, B., P. Gal, and I. Wanner (2017): "Structural policy indicators database for economic research (SPIDER)," *OECD Economics Department Working Papers*.

Gourinchas, P.-O., S. Kalemli-Ozcan, V. Penciakova, and N. Sander (2020): "COVID-19 and SME Failures," *Federal Reserve Bank of Atlanta Working Paper*.

Gourio, F., T. Messer, and M. Siemer (2016): "Firm Entry and Macroeconomic Dynamics: A State-Level Analysis," *American Economic Review*, 106, 214–18.

Hodbod, A., C. Hommes, S. J. Huber, and I. Salle (2021): "The COVID-19 consumption game-changer: evidence from a large-scale multi-country survey," *European Central Bank Working Paper Series*.

IMF (2020): "Database of Country Fiscal Measures in Response to the COVID-19 Pandemic," *Washington, D.C: International Monetary Fund.*

Johnson, P. and S. Parker (1994): "The Interrelationships between Births and Deaths," *Small Business Economics*, 6, 283–290.

Klapper, L., L. Laeven, and R. Rajan (2004): "Entry Regulation as a Barrier to Entrepreneurship," *Journal of Financial Economics*, 82, 591–629.

Martin, P., M. Cros, and A. Epaulard (2021): "Will Schumpeter Catch Covid-19?" *CEPR Discussion Papers*.

McGowan, M. A. and D. Andrews (2016): "Insolvency Regimes And Productivity Growth," *OECD Economics Department Working Paper*.

Moreira, S. (2017): "Firm Dynamics, Persistent Effects of Entry Conditions, and Business Cycles," *Center for Economic Studies, U.S. Census Bureau Working Papers series*.

Osotimehin, S. and F. Pappadà (2017): "Credit Frictions and The Cleansing Effect of Recessions," *The Economic Journal*, 127, 1153–1187.

Palazzo, F., G. Gobbi, and A. Segura (2020): "Unintended effects of loan guarantees during the Covid-19," *VoxEu.org*.

Pe'er, A. and I. Vertinsky (2008): "Firm exits as a determinant of new entry: Is there evidence of local creative destruction?" *Journal of Business Venturing*, 23, 280–306.

Sedláček, P. and V. Sterk (2017): "The Growth Potential of Startups over the Business Cycle," *American Economic Review*, 107, 3182–3210.

Tian, C. (2018): "Firm-level entry and exit dynamics over the business cycles," *European Economic Review*, 102, 298–326.

Appendix Graphs

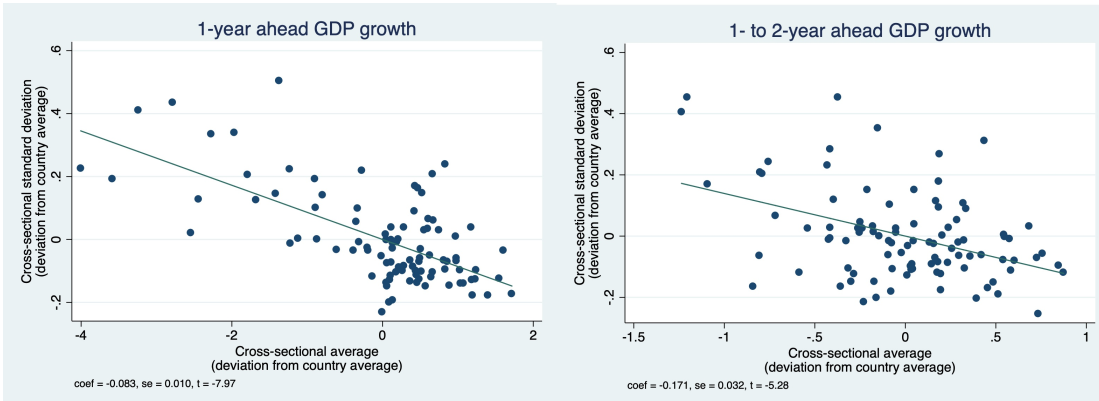

Figure 7: Better growth forecasts come with reduced uncertainty. Each panel plots the average and standard deviation of individual forecasts for GDP growth the United States, Germany, France, the United Kingdom, Italy, Spain and Japan, for the period 2008-2019, as reported in the Consensus Forecast publication. The left-hand panel plots the average and standard deviation for 1-year ahead GDP growth considering the forecasts published in January of the current year for the current year GDP growth. The right-hand panel plots the average and standard deviation for 1- to 2-year ahead GDP growth considering the forecasts published in January of the current year, for 1- to 2-year ahead GDP growth. All reported figures are deviations from country averages. All averages and standard deviations are computed with at least 15 indivudual forecasts.