Risk channels in the economy

- The dynamics of risk bearing and distribution are important for economic outcomes.
- Caballero Simsek, 2020 construct a NK model where risk affects mainly aggregate demand:
  1. Consumption wealth effect
  2. Investment via marginal Q
- Dynamics of risk for an individual agent has three main components:
  1. Risk perceptions/ beliefs
  2. Risk aversion
  3. Physical distribution of the cash-flows in the economy.
- Demand channel is mainly concerned with the first two components.
- I want to explore another channel by which risk can affect macroeconomic outcomes.

Risk channel is inseparable from growth

- **Schumpeterian theory:** Technological innovation is the mmain engine for economic growth.
- Recent evidence: Kogan et. al. 2017 QJE
- **Main idea:** Innovation is inseparable from risk. Innovative firms are risky and need to be supported with risk bearing capital.
- Identifying a separate channel for risk bearing capacity that affects the potential output of the economy separate from the demand channel.
- Construct a growth model that puts risk at the center of the model.
- A model of endogenous risk taking that drives productivity growth.
- Do we need frictions? (Not sure.)

Basic framework

- There are 2 kinds of firms in the economy - growth and value.
- Growth firms are innovative but risky.
- Value firms have lesser risk but are not innovative.
- A household can choose between saving in a risk free Govt. bond, low risk value firm or high risk growth firm.
- If the flow of risky capital to the growth firms in the economy increase for whatever reason (belief shocks, lowering of risk premia etc.), then the technological innovation in the economy increases with a lag.
- This innovation directly ties into higher TFP growth of the Grwoth firms.

Empirical evidence

- We will track the flow of funds using the credit spreads.
- Since credit spread data is not readily available I use Credit default swap data which moves almost in-line with credit spreads. (For instance, a firm with a 5 year credit spread of 50 bps, may have a CDS spread of 55 bps.)
- Higher the spread, higher the cost of capital for the firm and lower is the flow of risky capital into the firm.
- We use patents filed by the firm as a proxy for the innovative activity.
- We use the following econometric model:

$$y_{i,t+1} = \alpha_i + \beta cds_{i,t} + \gamma X_{i,t} + \epsilon_{i,t+1}$$

where i indexes a firm and t indexes a month. y is a measure of innovation like patents or cites. cds is the credit spreads, $X_{i,t}$ are the controls.

- We assume α_i is correlated with $\epsilon_{i,t+1}$ and so we have a Fixed Effects model.

Identification assumptions

- The following factors affect CDS spreads:
  1. Risk aversion of the investor.
  2. Risk perception/ beliefs of the investor.
  3. The default risk of the firm in the physical measure.
- **Assumption 1:** The firm management is unaffected by the risk perceptions and risk aversions of the investors. So they invest in innovative projects solely based on their finances.
- Based on Assumption 1, the first 2 factors that affect the CDS do not affect innovations activity. But the default risk of the firm can still affect innovation.
- **Assumption 2:** The default risk at very long horizons 30Y, does not affect innovative activity (which while a long horizon itself, I assume is not longer than 20Y.)
- Then I use the 30Y CDS spreads as an instrument for the firm's credit spreads.

Result-1: Effect of CDS spreads on innovation

Variable	# patents	# cites	# patents	# cites	# patents	# cites
lag cds	0.001***	0.010***	-0.002***	-0.034***	-0.002***	-0.034***
	[0.000]	[0.003]	[0.001]	[0.007]	[0.001]	[0.007]
lag cds x market to book			0.001***	0.014***	0.001***	0.014***
			[0.000]	[0.002]	[0.000]	[0.002]
Industry FE	No	No	No	No	Yes	Yes
Size bin FE	No	No	No	No	Yes	Yes
N	8189	8189	8189	8189	8189	8189
R2	0.817	0.515	0.817	0.518	0.817	0.518
adj R2	0.815	0.512	0.816	0.515	0.816	0.515
AIC	36422.883	75233.291	36403.206	75185.809	36403.206	75185.809

Table: CDS spreads and innovation

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