

Inflation: an occult incentive?

The lack of financial opportunity as an incentive to emerge from the underground economy.

Vincenzo Alfano¹, Salvatore Capasso², Salvatore Ciucci³

November 21, 2023

¹Università di Napoli "Parthenope"

²Consiglio Nazionale per le Ricerche

³Università della Campania Vanvitelli

Table of contents

Introduction

- Aim
- Motivations
- Abstract
- Why this matters?

Literature review

The model

- Data Sources
- Main variables
- Estimation strategy
- Comments

Conclusions

- Conclusions
- Thanksgiving

Introduction

Aim

What is the direction of the causal next between inflation and underground economy?

Introduction

Aim

What is the direction of the causal next between inflation and underground economy?

This work tackles the question by empirically analyzing data about Italian regional inflation and underground sector.

Introduction

Motivations

It's usually considered that the shadow economy causes inflation, since the government prints money instead of raising taxes because of the existence of a large, un-taxable underground sector.

Introduction

Motivations

It's usually considered that the shadow economy causes inflation, since the government prints money instead of raising taxes because of the existence of a large, un-taxable underground sector. Nevertheless, this channel is not likely in the European Union, since the inability for the members to print currency.

Introduction

Motivations

It's usually considered that the shadow economy causes inflation, since the government prints money instead of raising taxes because of the existence of a large, un-taxable underground sector. Nevertheless, this channel is not likely in the European Union, since the inability for the members to print currency. We argue that there is another channel, with inverse causality. A change in the inflation rate not due to governmental policies, may also have an impact on the shadow economy. Indeed, the higher the inflation is, the higher is the cost of keeping money liquid.

Introduction

Abstract

By definition, the underground sector relies on liquid money (Smith 1994),

Introduction

Abstract

By definition, the underground sector relies on liquid money (Smith 1994), and entrepreneurs in the shadow economy may not have access to financial products, due to the impossibility of providing ledger and guarantees to banks and other intermediaries (Capasso and Jappelli 2013).

Introduction

Abstract

By definition, the underground sector relies on liquid money (Smith 1994), and entrepreneurs in the shadow economy may not have access to financial products, due to the impossibility of providing ledger and guarantees to banks and other intermediaries (Capasso and Jappelli 2013).

In this sense, we look at inflation as an occult incentive in the choice of going underground, instead of an occult tax.

Introduction

Abstract

By definition, the underground sector relies on liquid money (Smith 1994), and entrepreneurs in the shadow economy may not have access to financial products, due to the impossibility of providing ledger and guarantees to banks and other intermediaries (Capasso and Jappelli 2013).

In this sense, we look at inflation as an occult incentive in the choice of going underground, instead of an occult tax.

To test our hypotheses, we apply our theoretical framework to the case of Italy, in the years after the adoption of Euro. This is an interesting case, since Italy had just lost the ability to print more money, and furthermore Italy has one of the biggest underground economies of Europe.

Introduction

Abstract

By definition, the underground sector relies on liquid money (Smith 1994), and entrepreneurs in the shadow economy may not have access to financial products, due to the impossibility of providing ledger and guarantees to banks and other intermediaries (Capasso and Jappelli 2013).

In this sense, we look at inflation as an occult incentive in the choice of going underground, instead of an occult tax.

To test our hypotheses, we apply our theoretical framework to the case of Italy, in the years after the adoption of Euro. This is an interesting case, since Italy had just lost the ability to print more money, and furthermore Italy has one of the biggest underground economies of Europe.

Does an increase in inflation impacts the shadow economy?

Why this matters?

We should consider studying the channel lying behind inflation and underground economy because:

Why this matters?

We should consider studying the channel lying behind inflation and underground economy because:

1. In the last twenty years many country gave their monetary policy to the European Central Bank;

Why this matters?

We should consider studying the channel lying behind inflation and underground economy because:

1. In the last twenty years many country gave their monetary policy to the European Central Bank;
2. many countries applying to join the EU have a large underground sector;

Why this matters?

We should consider studying the channel lying behind inflation and underground economy because:

1. In the last twenty years many country gave their monetary policy to the European Central Bank;
2. many countries applying to join the EU have a large underground sector;
3. shading light on the mechanism may help understanding the best way to fight underground economy;

Why this matters?

We should consider studying the channel lying behind inflation and underground economy because:

1. In the last twenty years many country gave their monetary policy to the European Central Bank;
2. many countries applying to join the EU have a large underground sector;
3. shading light on the mechanism may help understanding the best way to fight underground economy;
4. the current scientific explanation is somehow unable to take into account what happens in EU, a very interesting market.

Literature review

Our study contributes to the research on underground economy.

Literature review

Our study contributes to the research on underground economy.

- ▶ Koreshkova (2003) builds a general equilibrium monetary model, observing that the underground economy is a bigger sector in developing economies;
- ▶ Gillman and Kejak (2005) find that an increase in inflation raises the price of the corruption service, reduces the non-market good consumption, and tends to lower the balanced-path growth rate by more than in conventional models.
- ▶ Ahiabu (2006) focuses on Peru, finding some connections with the inflation rates of the country in the 1980 decade and in 2005;
- ▶ Maxhar and Meón (2012) find a negative relation between tax burden and the size of shadow economy, and a positive relation between inflation and the size of shadow economy.

Literature review

To the best of our knowledge none of these specifically addresses the issue of the impact of inflation on shadow economy,

Literature review

To the best of our knowledge none of these specifically addresses the issue of the impact of inflation on shadow economy, nor anyone studies the case of Italy.

Data

Sources

We construct a balanced panel dataset, with data from the twenty Italian regions, from 2001 to 2010.

Data

Sources

We construct a balanced panel dataset, with data from the twenty Italian regions, from 2001 to 2010. Our main sources are:

- ▶ Bankitaly *Survey on Household, Income and Wealth*, in the wave of 2002 to 2010;

Data

Sources

We construct a balanced panel dataset, with data from the twenty Italian regions, from 2001 to 2010. Our main sources are:

- ▶ Bankitaly *Survey on Household, Income and Wealth*, in the wave of 2002 to 2010;
- ▶ ISTAT *different datasets*;

Data

The Underground economy

Using microdata from Bankitaly, and Following Capasso and Jappelli (2013), we estimate the underground sector as:

Data

The Underground economy

Using microdata from Bankitaly, and Following Capasso and Jappelli (2013), we estimate the underground sector as:

$$Underground = \frac{(x - y) - z}{(x - y)}$$

where:

Data

The Underground economy

Using microdata from Bankitaly, and Following Capasso and Jappelli (2013), we estimate the underground sector as:

$$Underground = \frac{(x - y) - z}{(x - y)}$$

where:

- ▶ x is the age of the interviewed;

Data

The Underground economy

Using microdata from Bankitaly, and Following Capasso and Jappelli (2013), we estimate the underground sector as:

$$Underground = \frac{(x - y) - z}{(x - y)}$$

where:

- ▶ x is the age of the interviewed;
- ▶ y is the age in which she started to work;

Data

The Underground economy

Using microdata from Bankitaly, and Following Capasso and Jappelli (2013), we estimate the underground sector as:

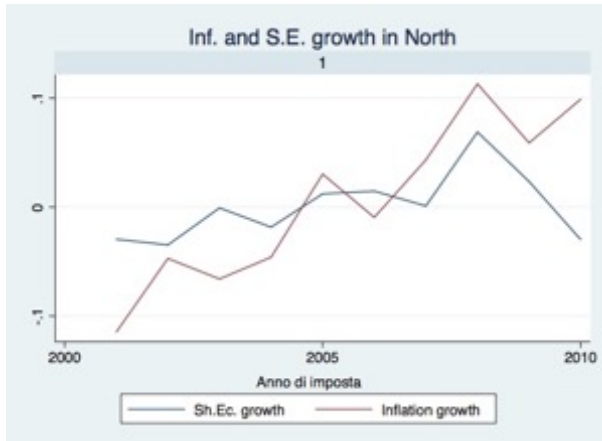
$$Underground = \frac{(x - y) - z}{(x - y)}$$

where:

- ▶ x is the age of the interviewed;
- ▶ y is the age in which she started to work;
- ▶ z is the year for which social security contributions have been paid.

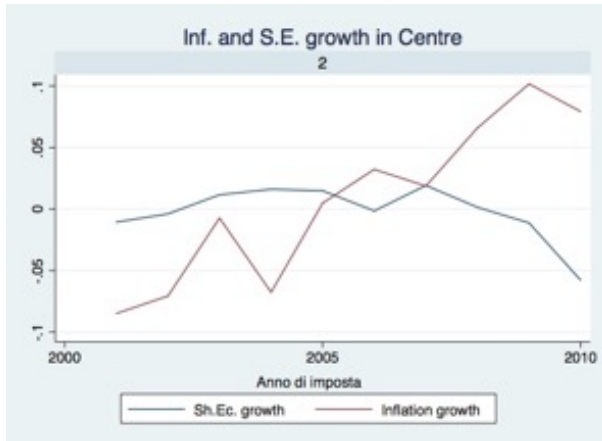
Main variables

North Italy



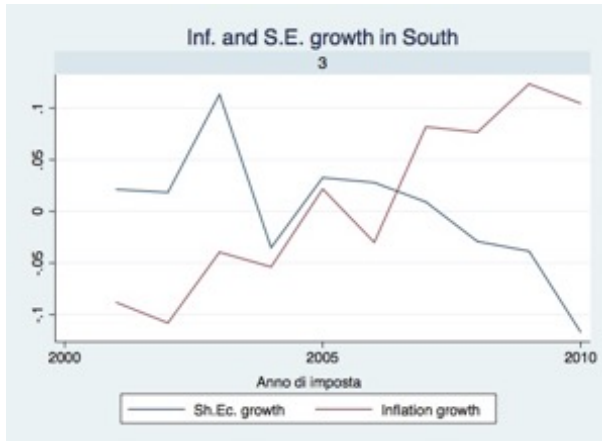
Main variables

Central Italy



Main variables

South Italy



Estimation strategy

The strategy

We estimate the impact of inflation on shadow economy with a simple F-GLS, estimating the following equation:

Estimation strategy

The strategy

We estimate the impact of inflation on shadow economy with a simple F-GLS, estimating the following equation:

$$y = \alpha + \beta_1 x_1 + \beta_2 X_2 + \epsilon$$

where

Estimation strategy

The strategy

We estimate the impact of inflation on shadow economy with a simple F-GLS, estimating the following equation:

$$y = \alpha + \beta_1 x_1 + \beta_2 X_2 + \epsilon$$

where

1. y is a proxy of the size of the underground sector;

Estimation strategy

The strategy

We estimate the impact of inflation on shadow economy with a simple F-GLS, estimating the following equation:

$$y = \alpha + \beta_1 x_1 + \beta_2 X_2 + \epsilon$$

where

1. y is a proxy of the size of the underground sector;
2. x_1 is the inflation, the covariate of main interest;

Estimation strategy

The strategy

We estimate the impact of inflation on shadow economy with a simple F-GLS, estimating the following equation:

$$y = \alpha + \beta_1 x_1 + \beta_2 X_2 + \epsilon$$

where

1. y is a proxy of the size of the underground sector;
2. x_1 is the inflation, the covariate of main interest;
3. X_2 is a vector of control variables

Estimation strategy

Control variables

Following the main literature on the topic, we use as control variables:

- ▶ the regional taxes (as a proxy for the cost of emerging in the legit sector);

Estimation strategy

Control variables

Following the main literature on the topic, we use as control variables:

- ▶ the regional taxes (as a proxy for the cost of emerging in the legit sector);
- ▶ the log of the amount of regional laws (as a proxy of the regional red tape);

Estimation strategy

Control variables

Following the main literature on the topic, we use as control variables:

- ▶ the regional taxes (as a proxy for the cost of emerging in the legit sector);
- ▶ the log of the amount of regional laws (as a proxy of the regional red tape);
- ▶ the size of regional government spending and the GDP per capita, to proxy regional welfare;

Estimation strategy

Control variables

Following the main literature on the topic, we use as control variables:

- ▶ the regional taxes (as a proxy for the cost of emerging in the legit sector);
- ▶ the log of the amount of regional laws (as a proxy of the regional red tape);
- ▶ the size of regional government spending and the GDP per capita, to proxy regional welfare;
- ▶ and finally a dummy that indicates if a region has a special regional Constitution or not.

Data

Other independent variables

Table: Descriptive Statistics

Variable	Observations	Mean	Std. Dev	Min	Max	Source
Underground Sector	200	.1984032	.0524407	.1034352	.3046394	<i>Autors' calculation</i>
Inflation	200	118.032	7.447584	104.5	134.8	<i>NIC, per l'intera collettività</i>
Regional Tax	200	7.97e+07	4.69e+07	1.69e+07	2.00e+08	<i>Addizionale IRPEF</i>
Log Regional Laws	200	3.261314	.5714671	1.386294	4.477337	<i>Authors' calculation</i>
Log GDP pc	200	10.08212	.2699236	9.520205	10.50022	<i>Spesa Pubblica Regionale</i>
Tot. Regional Gov. Expenditure	200	21.28443	13.4963	8.086295	85.73438	<i>PIL per capita</i>

Source: Bank of Italy *Survey on Household, Income and Wealth* and ISTAT.

Table: Estimates

	F-GLS Fix effects				
	(1)	(2)	(3)	(4)	(5)
	Underground	Underground	Underground	Underground	Underground
Inflation	-0.000504***	-0.000685***	-0.000730***	-0.000755***	-0.00116***
Regional Tax		2.44e-10*	2.78e-10	2.92e-10	3.14e-10**
Log Regional Laws			-0.00261	-0.00260	-0.00253
Tot Reg Gov Exp				-0.000359	-0.000321
Log GDP pc					0.0504
Observations	200	200	200	200	200
R2	0.086	0.095	0.101	0.112	0.125

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Constant included but not reported.

Table: Estimates

	F-GLS Fix effects					
	(1)	(2)	(3)	(4)	(5)	(6)
	Underground	Underground	Underground	Underground	Underground	Underground
Inflation	-0.000499***	-0.000630***	-0.000668***	-0.000680***	-0.00286	-0.00286
Regional Tax		1.76e-10	2.01e-10	1.98e-10	1.88e-10	1.75e-10
Log Reg.Laws			-0.00253	-0.00249	-0.00269	-0.00272
TotRegGovExp				-0.000346	-0.000377	-0.000356
Log GDPpc					0.0503**	-0.0489**
Sp.Status Dummy						-0.00857
Observations	200	200	200	200	200	200

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Constant included but not reported.

Estimation strategy

Comments

As expected, the regional tax has a positive effect on the underground sector: the higher the local tax pressure is, the bigger the underground sector is.

Estimation strategy

Comments

As expected, the regional tax has a positive effect on the underground sector: the higher the local tax pressure is, the bigger the underground sector is.

Unlike our prediction, the log of regional laws has no positive effect on the underground economy. Is it possible that in such a complex legal framework, like the one ruling nowadays in Italy, composed by national, European and regional level laws, the impact of the latter set of rules on the choice to go underground do not have such an important weight in the decision of the potential entrepreneur.

Indeed, even if of a negative sign, no coefficient has much statistical significance in all the different specifications of our models.

Estimation strategy

Comments

Both Public Regional Expenditure and Gross Domestic Product per capita have a negative sign, suggesting that the bigger the public sector of a region, or the richer a region is, the smaller the size of its shadow economy is.

Conclusions

The inflation seems to be a statistically significant determinant of the underground economy in each and any specification of the model.

Conclusions

The inflation seems to be a statistically significant determinant of the underground economy in each and any specification of the model.

It also has always a negative sign, suggesting that the greater is inflation, the lower is the underground sector.

Conclusions

The inflation seems to be a statistically significant determinant of the underground economy in each and any specification of the model.

It also has always a negative sign, suggesting that the greater is inflation, the lower is the underground sector.

While the literature address inflation as a way for the government to tax the underground sector, we argue that also shocks to the inflation have an impact on the shadow economy.

Conclusions

The inflation seems to be a statistically significant determinant of the underground economy in each and any specification of the model.

It also has always a negative sign, suggesting that the greater is inflation, the lower is the underground sector.

While the literature address inflation as a way for the government to tax the underground sector, we argue that also shocks to the inflation have an impact on the shadow economy.

Instead of the usual definition of an occult tax, we look at inflation as an occult incentive, in the choice of going underground.

Conclusions

Thank you for the attention!

For contact, email vincenzo.alfano@uniparthenope.it