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Setting inflation targets: a microeconomic approach

Abstract

In this paper, we show how to set inflation targets that maximise economic growth and show that such inflation targets equal the risk of doing business. Our approach differs from previous attempts to identify "ideal" inflation (e.g., using regression analysis of inflation vs. growth) as we use microeconomic and structural analysis in line with analyses of, for example, market structures, competition, consumer choices, and international trading.

1. Motivation: over two decades of dismal growth rates in Western economies

The origin of setting inflation targets dates to the end of the 1980s when Arthur Grimes proposed setting an inflation target between 1% and 2% in New Zealand. Sometimes, it's wrongly reported that Grimes proposed a 2% target.[1]

At the time, Grimes concluded:

"An annual inflation rate of approximately 9 per cent is estimated to decrease the annual growth rate by around 1 percentage point. This finding means that the costs of even a low inflation rate are estimated to be large given that it is the growth rate, not just the level of output, which is affected by inflation."[2]

[1] 'Should central banks' inflation targets be raised?'. *The Economist*, 21 July 2022, accessed 22 May 2023, <https://www.economist.com/finance-and-economics/2022/07/21/should-central-banks-inflation-targets-be-raised>

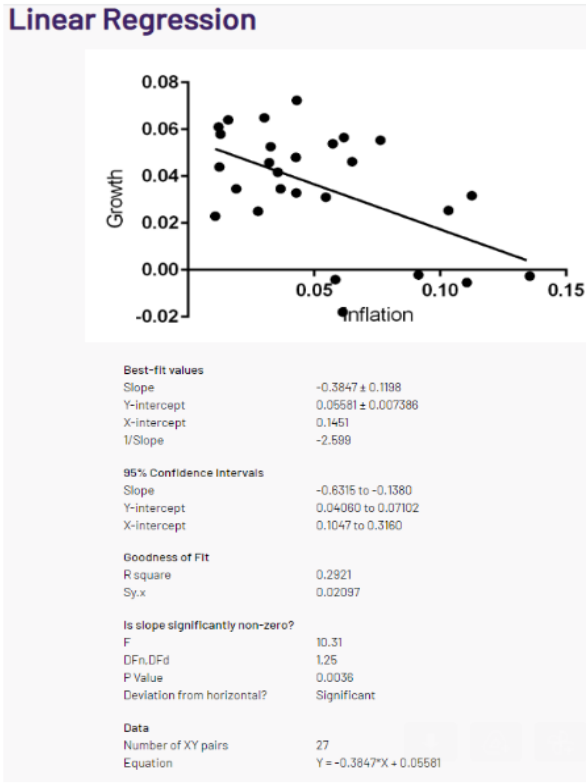
also: Miller A 2023, 'The curious history of the Federal Reserve's 2% inflation targeting, explained'. *CNBC*, 20 February 2023, accessed 22 May 2023, <https://www.cnbc.com/2023/02/20/the-federal-reserves-2percent-inflation-targeting-policy-explained.html>

[2] Grimes A 1991, 'The Effects of Inflation on Growth: Some International Evidence'. *Weltwirtschaftliches Archiv Bd.* 127, H. 4 (1991), pp. 631-644, accessed 22 May 2023, <https://www.jstor.org/stable/40440058>

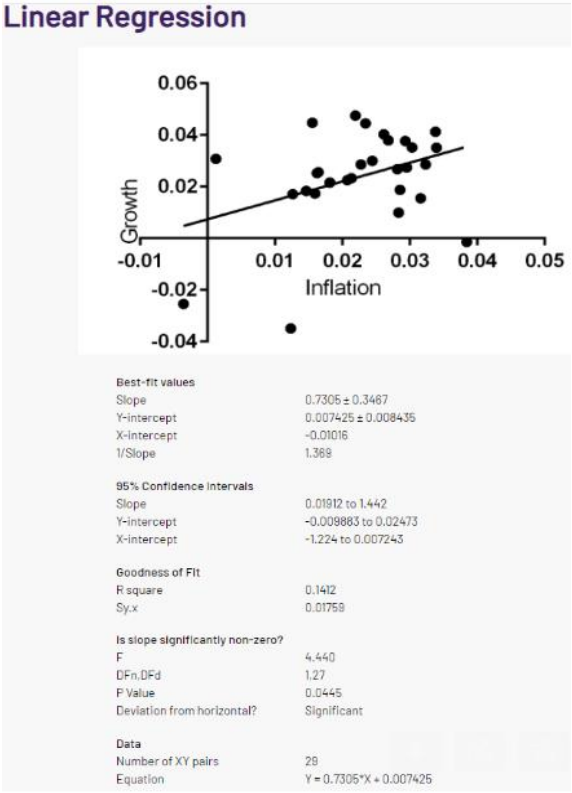
In his research, Grimes used IMF data from between 1961 to 1987. He didn't have the benefit of using data from the 1990s, 2000s and 2010s. When we run a rudimentary assessment using regression, we get the following results based on the World Bank data for the United States.

Chart 1: Regression analysis of inflation vs growth, United States[3]:

1961 – 1987



1992 - 2020



Whilst this is only indicative - without deciding upon correlation or causality relationships and using regression may not be ideal due to the small sizes of the samples - it suggests that during the period of high inflation, 1961 – 1987, reducing inflation seemed to lead to increased economic growth. However, inflation reduction decreased economic growth during lower inflation, 1992 – 2020.

Motivated by this, we examine the World Bank data for inflation and growth rates for major economies (for the years between 1965 and 2018), such as the United States, the United Kingdom, and Germany. In this case, we look at linear trends of 5-yearly averages of inflation and growth rates.

[3] Source: data from World Bank sourced by *Macrotrends*, accessed 22 May 2023, <https://www.macrotrends.net/countries/USA/united-states/inflation-rate-cpi>

Chart 2: United States - 5 yearly moving average[4]:

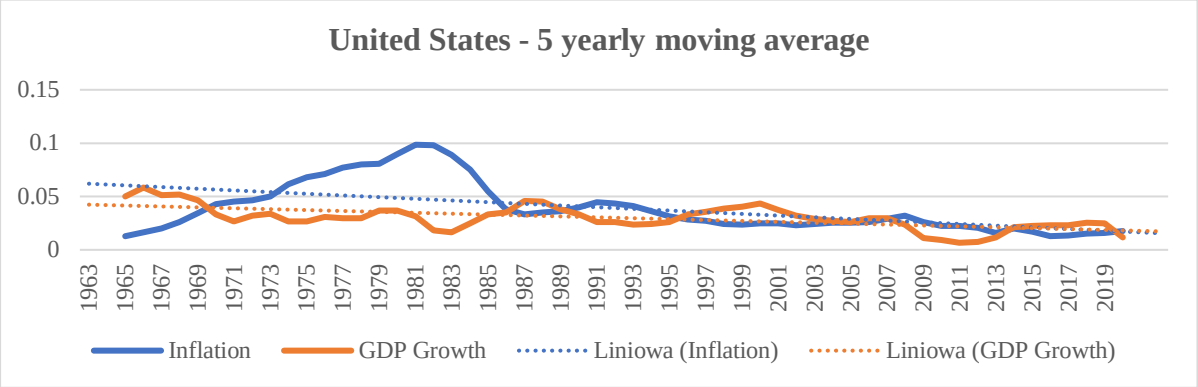


Chart 3: United Kingdom - 5 yearly moving average[5]:

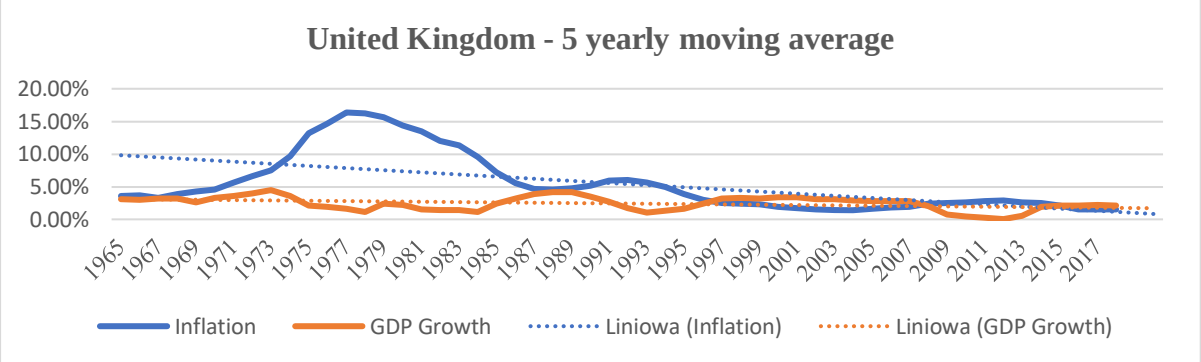
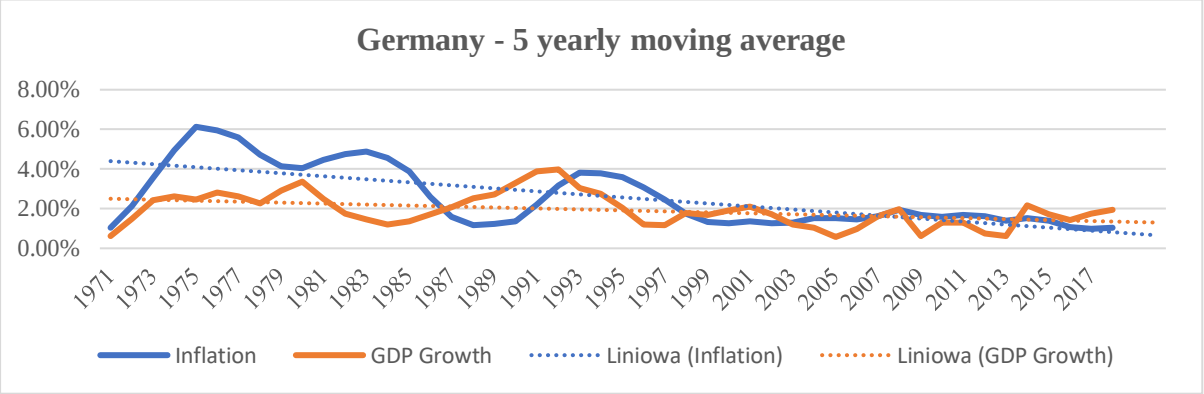


Chart 4: Germany - 5 yearly moving average[6]:



[4] Source: data from World Bank sourced by *Macrotrends*, accessed 22 May 2023, <https://www.macrotrends.net/countries/USA/united-states/inflation-rate-cpi>

[5] Source: data from World Bank sourced by *Macrotrends*, accessed 22 May 2023, <https://www.macrotrends.net/countries/GBR/united-kingdom/inflation-rate-cpi>

[6] Source: data from World Bank sourced by *Macrotrends*, accessed 22 May 2023, <https://www.macrotrends.net/countries/DEU/germany/inflation-rate-cpi>

Let's examine other economies, not only major Western economies. We observe trends in many countries wherein, in the last 50 years or more, while the inflation trend has decreased, the economic growth rate trend has also decreased.[7]

This may suggest the following conjecture: decreasing inflation in the long-term results in a decreasing economic growth rate. However, considering Grimes' findings, it seems more plausible to suggest that - starting from a high inflation level - decreasing inflation results in an increasing economic growth rate. But when inflation reaches a certain (low) level, and it seems that such a level was reached in countries such as the United States, United Kingdom, and Germany (and others) in the last 30 years, further decrease in inflation starts resulting in decreasing economic growth rates.

Therefore, there is an ideal inflation level above 0% and, as it seems, above the current inflation targets of 2% or 2.5%, which we may consider setting as the inflation target. At this level, the economic growth rate would be maximised. But what is it?

On 21 July 2022, The Economist posed a question in the article's title: *"Should central banks' inflation targets be raised?"*. The unnamed (which is the norm for The Economist's articles) author stated:

"[…] economists have struggled to identify differences in the costs to an economy from different stable, low-single-digit inflation rates."

and earlier in the article:

"Deciding which low but positive number is desirable is trickier."[8]

It appears that the lack of methodological clarity made The Economist conclude, quite harshly, about the way the inflation target was set first in New Zealand in December 1989, and from there, it spread around the world:

"Rather than being the outcome of intense economic debate, the figure—which was the first formal target to be adopted by a central bank—owes its origin to an offhand remark by a former finance minister, who suggested that the soon-to-be-independent central bank should aim for either zero or 1% inflation.

[7] Pytel G 2022, 'Methodology of calculating inflation targets'. *Instytut Sobieskiego*, pp. 23 – 24, accessed 22 May 2023, <https://sobieski.org.pl/wp-content/uploads/Methodology-of-calculating-inflation_pages_4-1.pdf>

[8] 'Should central banks' inflation targets be raised?'. *The Economist*, 21 July 2022

The central-bank chief and incumbent finance minister used that as a starting-point, before plumping for 0-2%."[9]

In this article, we will show how to end this struggle of economists trying *"to identify differences in the costs to an economy from different stable, low-single-digit inflation rates"* and how to set inflation targets, which – if met – maximise economic growth. We will show that such targets are given to us by the markets. And it's for us to discover them.

2. Setting up the scene: inflation and risk of doing business

It's universally accepted that there is a risk when performing economic activities. The risk of doing business exists. Whilst there is no generally accepted economic indicator for this, unlike for inflation, financial institutions use Equity Risk Premia as such an indicator on the country's level.

It's broadly accepted that Equity Risk Premia are reasonably accurate in the long term. Therefore, whilst there may be an argument about whether Equity Risk Premia are genuinely representative of the risk of doing business per country, and by the same token as we may dispute the accuracy of inflation measurement, we will assume that Equity Risk Premia are reasonably accurate and representative as a measure of the risk of doing business in different countries.

Let us assume that inflation is less than the risk of doing business. Will people, as economic actors, invest? Some will and some won't. This is a counterpart of behaviour under the law of supply and demand. People are differently affected by price changes. But generally, we accept that the law of supply and demand works. I.e., if the price goes up, people will buy less. And if the price goes down, people will buy more. Thus, when inflation is lower than the risk of doing business, people won't invest. They will hoard money. This is because they lose less by storing money than by investing. This is because the risk of doing business is greater than inflation. And the risk, if ascertained correctly, is an ex-ante loss. It tells us what an economic actor will ultimately lose.

The same arguments explain why people will invest if inflation is greater than the risk of doing business. On this basis, we can conclude that inflation higher than the risk of doing business

[9] 'Should central banks' inflation targets be raised?'. *The Economist*, 21 July 2022

will increase the economic growth rate.[10] This is true. But it's a very limited truth. Milton Friedman compared inflation to alcoholism:

"Inflation is just like alcoholism. In both cases when you start drinking or when you start printing too much money, the good effects come first. The bad effects only come later. That's why in both cases there is a strong temptation to overdo it. To drink too much and to print too much money. When it comes to the cure, it's the other way around. When you stop drinking or when you stop printing money, the bad effects come first, and the good effects only come later."[11]

Thus, without further ado, bearing the above in mind, let us determine what level of inflation maximises the economic growth rate.

3. How to set inflation targets?

There is a broad consensus amongst economists, policymakers, and politicians that economic growth would be maximised under perfect competition.

In real life, perfect competition doesn't exist; it's the role of political set-ups and regulators to enact laws and regulations that compensate for this. I.e., laws and regulations have an effect that makes it seem as if there were perfect competition. The differences amongst different political factions exist for "operational" reasons. For example, there is a debate about how much wealth should be distributed through imperfect markets, taxation, and direct state redistribution. Some (e.g. free market proponents) don't understand what perfect competition entails, i.e. that it means zero profit, even believing (wrongly) that this would entail zero growth rate.

If there were perfect competition, there would be a multitude of currencies competing to be used by economic actors. In contrast, every currency is currently a monopoly in economies where it is the legal tender. Its interest rate is decided by an authority, like a central bank, with

[10] Pytel G 2023, 'Inflacja, ryzyko i wzrost gospodarczy'. *Rzeczpospolita*, 20 February 2023, accessed 22 May 2023, <https://www.rp.pl/opinie-ekonomiczne/art37987721-grzegorz-pytel-inflacja-ryzyko-i-wzrost-gospodarczy>

[11] Friedman M, recording, accessed 22 May 2023, <https://www.linkedin.com/posts/wade-jensen-7605515_video-milton-friedman-inflation-is-just-activity-6958525861457227777-sSqJ?trk=public_profile_like_view>

this task delegated by the government. If there were perfect competition, different emitting banks would set interest rates for their currencies. But such interest rates would effectively be decided by the markets, rather than – as it is at present – by central bankers, macroeconomists, etc., as they would have been the outcome of currencies competing against one another. When it comes to setting interest rates, under perfect competition, emitting banks would have been price takers rather than price makers as they are at present. I.e. a competitive market would set interest rates for them.

Thus, in our approach, we will work out what inflation would be if it were set by the markets under perfect competition, knowing that this would maximise the economic growth rate. We will consider such inflation as the most desirable inflation target, i.e. inflation that maximises economic growth.

Firstly, we will assume that there is a state of perfect competition in the economy.

Secondly, after working out what inflation targets should be, we will show in the next section that despite this assumption, the result is directly and universally applicable to all economies, i.e. to economies where there isn't perfect competition.

Thirdly, we use a representative firm model[12] to analyse the economic growth process. We consider the economy as a one-step production system whereby an economic output at time, t_1, is the outcome of production processes applied to input at the start of the period at time, t_0.

In a perfect competition economy, i.e. with free entry and free exit, perfect information, etc., any actor can decide whether she wants to be a provider of capital, K, or, alternatively, a provider of labour, L. Whilst in real life, people may be both capital providers and labour providers at the same time – e.g. a worker who has savings – for clarity of our analysis, we consider economic actors as roles: either being a provider of capital or a provider of labour.

We assume that each economic actor has wealth, endowment, of the value, $V > 0$, which allows her to enter the market as a capital provider at any time and is seeking to maximise her growth rate as a result of the outcome of the production process, after a time between t_0 and t_1, Δt.

[12] For example: Ng Y-K, 'A Micro-Macroeconomic Analysis Based on a Representative Firm'. *Economica New Series,* Vol. 49, No. 194 (May, 1982), pp. 121-139, accessed 22 May 2023, <https://www.jstor.org/stable/2553302>

If an economic actor chooses to become a provider of capital, ***K***, the impact of the production process on her wealth, ***V***, at the outcome is as follows:

$$V*Return_K$$

$$Return_K = Risk + Growth + Profit_K$$

The right-hand side of this equation is a factual breakdown of the return of a capital provider.

Risk – is the risk of doing business in a particular economy, of being a capital provider. It's the same for all economic actors. It should be noted that if the risk is calculated correctly, it's, in fact, an ex-ante loss. It must be treated as representing loss.[13] ***Risk*** is a part of $Return_K$, which an economic actor accounts for as a part of the gross growth rate, which offsets the loss, i.e. the risk of doing business.

Growth **-** is an average net growth rate shared by all economic actors. Growth for all economic actors is the same. It may be deemed a "normalising" share of economic growth, or wealth created.

$Profit_1$ – is a net profit that an economic actor gets above, or below, ***Growth***. This is what differentiates economic actors in terms of their profitability.

If an economic actor chooses to become a provider of labour, ***L***, the impact of the production process on her wealth, V, at the outcome is as follows:

$$V*Return_L$$

$$Return_L = Inflation + Growth + Profit_L$$

The right-hand side of this equation is a factual breakdown of the return of a labour provider.

Inflation **-** is inflation in a particular economy during period Δt, between t_0 and t_1. It's the same for all economic actors. When an economic actor chooses to become a labour provider rather than a capital provider, her wealth is not invested in the production process, as it's held by her. She suffers a loss due to inflation. Therefore, ***Inflation*** is a part of $Return_L$, which an economic

[13] Risk, if calculated correctly, overall and in the long term, it is always a loss. However, due to economic growth, we may get an illusion that risk exists, but it didn't materialise when the gross growth rate, which is the return, is greater than the risk, as we observe the net growth rate greater than zero, i.e. we see the value greater than our loss, risk of doing business.

actor accounts for as a part of the gross growth rate. It represents the loss, which is a result of hoarding capital, ***K***, rather than investing it, due to inflation by the labour provider.

Growth – is an average net growth rate, shared by all economic actors. ***Growth*** for all economic actors is the same. It may be deemed a "normalising" share of economic growth/ wealth created.

$\boldsymbol{Profit_2}$ – is a net profit that an economic actor gets above, or below, ***Growth***. This is what differentiates economic actors in terms of their profitability.

Both equations, for $\boldsymbol{Return_k}$ and $\boldsymbol{Return_L}$, are statements of fact. Any value can be represented as a sum of three values. Values ***Risk***, ***Growth***, and ***Inflation*** are the same for all economic actors. They are economic indicators. Values $\boldsymbol{Profit_1}$ and $\boldsymbol{Profit_2}$ are individual economic actors. They differentiate economic actors with respect to their profitability. These equations also show that whilst under perfect competition, when profits equal zero, the growth rate doesn't have to be equal to zero. Ie. there are benefits – or losses - without profits for all economic actors in the form of economic growth, which is equally shared.

We don't include inflation as a part of the right-hand side of the $\boldsymbol{Return_K}$ equation. This is because once an economic actor, acting as a provider of capital - having employed her capital - is no longer affected by erosion due to inflation. The capital employed is affected by the risk of doing business with respect to providing a return and not maintaining the value of capital in line with inflation. This argument is a counterpart of the argument of not including sunk costs when considering a firm's shutdown conditions or of an argument used to unravel the so-called sunk cost fallacy (*"The sunk cost fallacy is a psychological barrier that ties people to unsuccessful endeavours simply because they've committed resources to it."*[14]), sometimes referred to as throwing good money after bad (un)economic behaviour.

Under perfect competition, the profits of all economic actors are zero.

Hence:

$$\boldsymbol{Profit_K = Profit_L = 0}$$

and:

[14] Tuovila A 2022, 'What Is a Sunk Cost—and the Sunk Cost Fallacy?'. *Investopeida*, 9 August 2022, accessed 22 May 2024, <https://www.investopedia.com/terms/s/sunkcost.asp>

$$\boldsymbol{Return_K = Risk + Growth}$$

$$\boldsymbol{Return_L = Inflation + Growth}$$

$\boldsymbol{Return_K}$ is a multiplier for wealth, $\boldsymbol{V}$, if an economic actor chooses to be a provider of capital.

$\boldsymbol{Return_L}$ is a multiplier for wealth, $\boldsymbol{V}$, if an economic actor chooses to be a provider labour of labour.

As mentioned earlier, under perfect competition, all economic actors have a free choice to become either a provider of capital or a provider of labour. This is a direct outcome of no existence of barriers for entry and exit, and rational choice is made due to the existence of perfect information. Therefore, if $\boldsymbol{Return_K > Return_L}$ all economic actors would be providers of capital, and if $\boldsymbol{Return_K < Return_L}$ all economic actors would be labour providers.

Consequently, $\boldsymbol{Return_K = Return_L}$ is a state of equilibrium under perfect competition, in which the distribution of being a capital provider or a labour provider is random.

Hence:

$$\boldsymbol{Return_K = Return_L}$$

$$\boldsymbol{Risk + Growth = Inflation + Growth}$$

$$\boldsymbol{Risk = Inflation}, \text{ or}$$

$$\boldsymbol{Inflation = Risk}$$

Therefore, under perfect competition assumption, i.e. conditions in which the economic growth rate is maximised, inflation would equal the risk of doing business.

This leads us to conclude that the inflation target in a particular economy should equal the risk of doing business in the economy. This inflation target is given to us by the market forces. This is what the invisible hand of the market tells us.

4. Policy conclusions: what inflation targets should be for real economies?

Firstly, we assume that we can measure all economic indicators needed to discover inflation targets sufficiently accurately. Thus, we assume that inflation data, economic growth rate data, and the risk of doing business data (assumed to be represented by the Equity Risk Premia

calculated by Aswath Damodaran) are sufficiently accurate and reflect the true inflation, economic growth rate and risk of doing business in economies.

However, it must be acknowledged that the work to refine the accuracy of the observed data is never-ending. Estimating inflation accurately to reflect inflation as it exists in an economy in the form of an average amongst all economic actors and similarly estimating the risk of doing business and economic growth rate will always be a challenge. However, in practice, keeping the above in mind but acting pragmatically, we must rely on the data, which is available to us and is widely accepted.

Secondly, the equilibrium state described by the equation $\boldsymbol{Return_K = Return_L}$ – including natural inflation, i.e. the response by the market to the risk of doing business, to balance it, rather than a monetary phenomenon created by excessive money creation - which would exist due to competition in a perfectly competitive economy, looks like that it's dynamic and unstable in real life. Any bias of a return toward providers of capital will result in underinvestment and hoarding of wealth by capital providers, "underemploying" available capital in production processes. Any bias of a return towards labour providers will result in an overheated economy with an inflationary bubble and eroding capital by inflation.

In real life, economic processes aren't generally stable. They are subject to short-term shocks, "black swans," discoveries of natural resources, patents, productivity improvements, etc.

It's a regulatory objective to create an environment through decision-making that makes it look like the economy is operating under perfect competition conditions. We know that inflation under such conditions would equal the risk of doing business. Hence, our analytical assumption of having perfect competition is also a regulatory objective. Therefore, our method of setting inflation targets – equal to what inflation would be under perfect competition – is directly and universally applicable even if there isn't perfect competition and when an authority, like a central bank, decides the inflation target. I.e. to maximise the economic growth rate, a central bank must set the inflation target – and tend to achieve it - to be equal to the risk of doing business, as this would be the inflation rate if there were perfect competition in the economy.

Thus, it's not for politicians, macroeconomists, or central bankers to decide what the inflation target should be: 0%, 1%, 2.5%, 2.5%, 3.5%, and so on. It's for them to discover what it would be under perfect competition. It's a practical challenge to measure the risk

of doing business, as indeed it's a challenge to measure inflation accurately, i.e., in a way that is representative of the economic process.

Therefore, we may conclude that, based on real-life data available to us, the inflation target, which equals the risk of doing business, should be estimated and managed as a long(ish)-term average, e.g. 5 yearly moving average of convergence of inflation with risk of doing business. The smaller the standard deviation of such a process measured retrospectively - inflation benchmarked to the risk of doing business (which is variable) with a view of them being as close to each other as possible, for as long as possible - the greater the adherence to inflation of behaving as if it was the result of the invisible hand of the market under perfect competition. Therefore, for the reasons stated earlier, such a dynamic inflation target – and meeting it – would maximise economic growth.

While we know the inflation target, this doesn't remove the challenges of meeting it.

In practice, and putting the last over 12 months of significant market shocks aside, if we use Damodaran's Equity Risk Premia of January 2022 as a guide for long-term inflation targets, we can finally settle the challenge posed by The Economist already cited above:

"Deciding which low but positive number [inflation] is desirable is trickier."

using our methodology. The inflation targets should be as follows (examples of estimates):

Table 1: Inflation targets for some countries[15]:

Country	***Inflation target***
United States	4.24%
United Kingdom	4.84%
Poland	5.08%

These are the best estimates based on the data available to us.

(More recently, Damodaran's Equity Risk Premia has been higher.[16] They also must be considered in practice. The hike in the Equity Risk Premia from last year is clearly due to the

[15] Damodaran A 2022, 'Country Default Spreads and Risk Premiums - Last updated: January 5, 2023' in: Pytel G 2022, pp 48 – 50

[16] Damodaran A 2023, 'Country Default Spreads and Risk Premiums - Last updated: January 5, 2023', accessed 22 May 2023, <https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html>

recent economic shocks. This must be averaged as a part of calculating long-term inflation targets.)

5. Economic conclusions: inflation, risk of doing business, and growth rate

The above analysis leads us to conclude that inflation is not only a monetary phenomenon, a Friedmanian tax, etc. It's also a fundamental economic phenomenon. Its role is to balance and compensate for the risk of doing business in the economy.

From a maximising economic growth rate perspective, the concept of keeping inflation as low as possible is justifiable if low inflation equals low risk of doing business. And keeping the risk of doing business, i.e. loss, as low as possible is a relatively uncontroversial proposition. This is a sense check of our analysis.

It's impossible to justify deflation as beneficial for economic growth as it would require a negative risk of doing business. This is not possible in real life. Milton Friedman's support for deflation was, in fact, his proposition of having a free lunch, even though he famously didn't believe that free lunches were possible. If we all accumulate enough capital to live comfortably, paying from and within a deflationary profit, we could all do nothing, effectively have no economy, and live comfortably at the same time. It's absurd.

5.1 Inflation and growth in the United States in 1980's compared to 2010's

The conclusion above, and other conclusions immediately below, are quantitatively modelled in the paper of Pytel G, *"Methodology of calculating inflation targets"*[17]. This paper showed, for the United States, the effects of low inflation on the economic growth rate in the 2010s, showing them as too low by comparison with the relevant data of the 1980s. Our model showed that, if we assume that the risk of doing business in the 1980s and 2010s was, on average, very close in the United States if inflation in the United States in the 2010s had been close to inflation of the 1980s, the United States growth rate in the 2010s would have been very close to the growth rate in the 1980s (i.e. higher).

Table 2: Inflation and growth in the United States between 1983 and 1992[18]:

[17] Pytel G 2022, contains technical sections, complete derivation and justification the presented formulae and their interpretations.

[18] Pytel G 2022, p. 32

Year	*Growth*	*Inflation*
1983	4.58%	3.21%
1984	7.24%	4.30%
1985	4.17%	3.55%
1986	3.46%	1.90%
1987	3.46%	3.66%
1988	4.18%	4.08%
1989	3.67%	4.83%
1990	1.89%	5.40%
1991	-0.11%	4.24%
1992	3.52%	3.03%

Table 3: Inflation and growth in the United States between 2011 and 2020, and expected growth in the United States if inflation between 2011 and 2020 was equal to inflation between 1983 and 1992[19]:

Year	*Growth*	*Inflation*	*Optimal growth if inflation was equal risk of doing business*
2011	1.55%	3.16%	3.05%
2012	2.25%	2.07%	4.32%
2013	1.84%	1.46%	4.37%
2014	2.53%	1.62%	5.02%
2015	3.08%	0.12%	7.06%
2016	1.71%	1.26%	4.69%
2017	2.33%	2.13%	4.58%
2018	3.00%	2.44%	5.29%
2019	2.16%	1.81%	4.78%
2020	-3.49%	1.23%	0.54%

5.2 Economic contraction and bubble vs. growth rate

If ***Inflation ≠ Risk***, we can calculate the size of the loss of economic growth rate in the form of economic contraction (cooling down of the economy) if inflation is less than the risk of doing business. It is:

[19] Pytel G 2022, p. 32

Equation 1: Formula for calculating contraction of growth if inflation is less than the risk of doing business[20]:

$$Contraction = gr - MGr = \left[\frac{-(i - MGr - 1) + \sqrt{(i - MGr - 1)^2 + 4l(MGr + 1)}}{2} - 1\right] - MGr$$

$$Value_{of_{Contraction}} = Contraction \cdot EV \text{ or } Value_{of_{Contraction}} = Contraction \cdot GDP$$

We can calculate the size of the loss of economic growth rate in the form of the inflationary bubble (overheating of the economy) if inflation is greater than the risk of doing business. It is:

Equation 2: Formula for calculating a bubble if inflation is greater than the risk of doing business [21]:

$$Bubble = MGr - gr = MGr - \left[\frac{-(i - MGr - 1) + \sqrt{(i - MGr - 1)^2 + 4l(MGr + 1)}}{2} - 1\right]$$

$$Value_{of_{Bubble}} = Bubble \cdot EV, \text{ ie. } Value_{of_{Bubble}} = Bubble \cdot GDP$$

In these formulae,

EV – is endowment value, gross domestic product, ie. ***GDP***.

i = Inflation – is inflation

l = Risk – is a risk of doing business (the symbol "***l***" is used to emphasise that risk is an ex-ante loss, and not that it may be something that may not materialise within the economy in the long term)

gr **-** is the economic growth resulting from applied production methods such as using new resources, new innovative tools, etc.

MGr – is a measured economic growth rate, increase in ***GDP***

5.3 Globalisation, single currency considerations, and the middle-income trap[22]

There are other implications for economic performance if ***Inflation ≠ Risk***.

5.3.1 Globalisation

[20] Pytel G 2022, pp. 29 - 31

[21] Pytel G 2022, pp. 29 - 31

[22] Pytel G 2022, pp. 64 - 75

Under unrestricted and deregulated, free trading arrangements, i.e. globalisation, despite the benefits of specialisation, there will always be a transfer of wealth from countries affected by a higher risk of doing business to countries enjoying a lower risk of doing business. In practical terms, generally and understandably (as also implied by our analysis), lower-risk countries are typically richer countries, and higher-risk countries are typically poorer countries. Therefore, globalisation may be deemed as a modern version of colonialism. Its effects can be quantified using our model.

Thus, from an economic perspective, if rich countries promote globalisation and poor countries oppose it - and this is not unusual behaviour on the global stage - respective groups of countries behave rationally in their correctly understood, economically beneficial self-interest.

5.3.2 Single currency considerations and the middle-income trap

Under unrestricted trading agreements and with common economic regulations, a single currency in different countries leads to the transferring of wealth from higher-risk countries to lower-risk countries. Countries with higher risk lose competitively compared to countries with lower risk.

The table below shows the loss as a percentage of GDP, due to the loss of comparative competitiveness in the Eurozone:

Table 4: Comparative competitiveness in terms of lost growth rate in the Eurozone[23]:

Country	***Competitiveness measure: bench-marked to the leader***
Estonia	0.00%

[23] Pytel G 2022, pp. 64 - 70

Lithuania	0.04%
Luxembourg	0.30%
Germany	0.60%
Netherlands	0.99%
Belgium	1.20%
Austria	1.39%
Latvia	1.80%
Finland	2.08%
France	2.19%
Ireland	2.24%
Slovakia	2.34%
Spain	2.40%
Slovenia	3.00%
Malta	3.95%
Cyprus	4.04%
Italy	4.14%
Portugal	4.84%
Greece	6.96%

The table closely resembles a generally accepted economic prosperity and competitiveness ranking in the Eurozone. It reflects what is commonly called the divide between the rich north and the poor(er) south in the Eurozone.

The Baltic countries, Estonia and Lithuania, being so high up in this table also validates our analysis and approach.

The financial markets consider Estonia and Lithuania as higher-risk countries compared to countries such as Luxembourg, Germany, and the Netherlands.[24] However, at the same time, the inflation in these Baltic countries was significantly higher, at least by 1%, in absolute terms, or like by ⅓ in relative terms, compared to inflation in these highly developed Eurozone economies. At the same time, the Purchasing Power Parity, PPP, of the Baltic countries compared to Germany is less than 75% in Estonia and less than 63% in Lithuania. Both Estonia and Lithuania are close to having the very lowest PPP in the Eurozone. And it's even lower compared to Luxembourg and the Netherlands.

[24] Damodaran A 2022, 'Country Default Spreads and Risk Premiums - Last updated: January 5, 2023' in: Pytel G 2022, pp 48 – 50

The Baltic countries maintained higher inflation in line with our approach to what inflation target should be to maximise economic growth rate, which compensated for being higher risk economies. This resulted in a higher growth rate and high competitiveness ranking.

However, in a single currency and common market zone, this is not an everlasting panacea. The difference in inflation rates will lead to the equalisation of PPP.

Once PPP reaches 100% - i.e. parity - but the difference in the risk of doing business remains, this will make compensating the higher risk of doing with higher inflation an uncompetitive policy. However, having inflation in higher-risk countries, such as Estonia or Lithuania, if it remains close to inflation in lower-risk countries, such as Germany, leads to contraction, cooling down of economies in higher-risk countries (such as Estonia or Lithuania if a higher risk of doing business remains there).

This effect - restricting growth either by making it impossible to compete using higher inflation or by contracting economic growth by pushing inflation below the risk of doing business - is a middle-income trap seen so often when growing higher-risk economies were trying to catch up with existing lower-risk, richer economies[25].

The model and the equations that we developed allow us to estimate the value of middle-income traps if we have accurate data for inflation, economic growth rate, and risk of doing business.

5.3.3 Current gap between the richest and others and stagflation

As a general comment, which is also a conclusion from our analysis: if inflation less than the risk of doing business exists for a prolonged period (which, in economic terms, is relative, as any effect also depends upon other factors, such as short term shocks, "black swans", etc.) the effect of hoarding capital by providers of capital leads to the (literally) exponentially growing gap between the richest and others, and ultimately to stagflation due to contraction, cooling down, of the economy, shrinking economic base at an exponential pace, where zero, i.e. no economy, is an ultimate limit. Looking at the last two decades of the development of the Western economies and the last few years crescendo – even preceding the COVID-19

[25] Griffith B 2011, 'Middle-Income Trap' in: Nallari R et al., *Frontiers in Development Policy*, World Bank 2011, pp 39 – 43, accessed 22 May 2023, <https://elibrary.worldbank.org/doi/pdf/10.1596/9780821387856_CH04>

pandemic and the war in Ukraine – it seems that it's a natural experiment, which validates our analysis and model.

6. Concluding remarks

Our methodology tells us that if we want low(er) inflation, which many economists and policymakers believe is desirable, we must decrease the risk of doing business, too, to match the inflation. Decreasing the risk of doing business is relatively uncontroversial. Indeed, it's desirable, as it amounts to decreasing waste – or what economists may call a deadweight loss – in the economy. However, decreasing inflation below the risk of doing business is counterproductive from an economic growth perspective as it decreases economic growth by shrinking the economic base. Thus, advocating low inflation without considering the risk of doing business appears scientifically flawed.

Similarly, as Friedman observed, increasing inflation above the risk of doing business may result in increased economic growth. It will incentivise investors to invest more. It's also a natural market reaction if inflation is kept too low for too long, i.e., inflation eventually goes up. But in the long term - and it may not be that long - inflation greater than the risk of doing business will have a Friedmanian "hangover" effect of inflation-fuelled growth.

The figures given above in this paper show that the inflation targets for the United States, UK, and Poland aren't out of the ordinary compared to what was proposed before.[26]:

- For example, in 2010, Olivier Blanchard proposed the inflation target for the US at 4%[27]
- In 2016, Phuong Ngo, based on an econometric model, proposed an inflation target for the US of between 3.4% and 5.5%[28]. Considering the dynamic characteristics of the risk of doing business and inflation, this is a spread in line with our model.

[26] White L H 2017, 'The New Inflationists'. *Cato at Liberty*, 27 July 2017, accessed 22 May 2023, <https://www.cato.org/blog/new-inflationists>

[27] Leigh D, 'A 4% inflation target?'. *VOX^{EU} CEPR*, 9 March 2010, accessed on 22 May 2023, <https://cepr.org/voxeu/columns/4-inflation-target>

[28] Phuong N V 2016, 'The risk of hitting the zero lower bound and the optimal inflation target'. accessed on 22 May 2023, <https://academic.csuohio.edu/ngo-phuong/wp-content/uploads/sites/63/2022/05/Ngo_OptimalInflation_Feb2016.pdf>

- In 2017, 22 top economists, including Nobel Prize winner Joseph Stiglitz, sent a letter to the Federal Reserve postulating a review of the inflation target, intending to increase it[29].
- On 28 November 2022, Olivier Blanchard wrote to the Financial Times proposing the hike of inflation targets[30].

The results of our methodology are also in line with pro perfect competition school of economic thought. Nevertheless, they may find very powerful opponents. Whilst keeping inflation below the risk of doing business keeps contracting the economy - significantly in the long term as it's an exponential process with limit zero (i.e. if this is not stopped, the economy would disappear) – in short to mid-term terms, it brings about benefits for capital providers by asymmetrically transferring wealth created for their benefit, with exponentially growing gap between the richest and others. Apart from economic wealth and market power, this also translates into political influence and political power (e.g., the ability to promote own agendas and vested interests and fund election campaigns in Western societies).

Martin Wolf noted that:

"Like all human institutions, central banks are imperfect and sometimes incompetent."[31]

Wolf is a highly trained and knowledgeable economist and an experienced economic editor. His note deserves careful consideration. People in professions, such as teachers, nurses, doctors, firefighters, cleaners, etc., are not allowed to be incompetent. If they are, they face disciplinary action. Ultimately, they are removed from their roles. Wolf didn't mention that incompetent central bankers are removed from the profession or should be removed.

Wolf's observation is very significant. As *"sometimes incompetent"* central bankers didn't meet very low inflation targets of 2% or 2.5% - which our analysis showed was too low for decades, and it was unsustainable and bound to fail in any event – the general public may think that an upward revision of inflation targets would not be credible and that this would damage central banks' credibility. It's based on a simple populist argument. Central bankers failed to

[29] Letter to the Board of the Federal Reserve, 8 June, 2017, *Popular Democracy*, accessed 22 May 2023, <https://populardemocracy.org/sites/default/files/Rethink%202%25%20letter.pdf>

[30] Blanchard O 2022, 'It is time to revisit the 2% inflation target'. *Financial Times*, 28 November 2022, accessed on 22 May 2023, <https://www.ft.com/content/02c8a9ac-b71d-4cef-a6ff-cac120d25588>

[31] Wolf M 2023, 'Monetary policy is not solely to blame for this banking crisis'. *Financial Times*, 28 March 2023, accessed 22 May 2023, <https://www.ft.com/content/179b9acf-e375-4471-990e-39c9772ada3b>

meet their low inflation targets, so they decided to increase the targets to cover up their impotence.

However, on the balance of:

- central banks having minimal credibility as it were, and reducing inflation by increasing interest rates, which is not rocket science, since to come up with such a concept requires nearly no knowledge whatsoever, as this is so blatantly obvious, so it doesn't enhance credibility, on the one hand, and
- yet another hardship that the general public will endure from the process of increased interest rates higher or longer than necessary to reduce inflation and then, again, having inflation too low, i.e. below the risk of doing business and damaging economic growth, on the other hand, leading to yet another "bust",

now it seems like a perfect opportunity to revise inflation targets using a proper methodology to set them to what they should be as if they were set under perfect competition and ensure that they are - what The Economist called - *"the outcome of intense economic debate"*.

This would be a way to restore some credibility in prudent economic management in Western economies, which would be in the public's best interest. This article is intended to be the first step in this process.

The challenge of meeting these new inflation targets will remain part of economic management. However, such targets will be viable and sustainable, unlike the current ones, which are too low and are bound to lead to stagflation and keep the economy in deep boom and bust cycles.

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