Employ America Research Report



Proceed with Caution! Comparing Inflation Across Countries is Complicated

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I. Introduction

Against the backdrop of a global pandemic, there has been a persistent desire to see how different policy actions have translated into different economic outcomes. If everyone experiences the pandemic, but European countries pursue one set of policies while the US pursues another, it is appealing to believe that we should be able to deduce the effects of these policies by looking at differences in aggregate economic measures. Those who believe the US to have engaged in excessive stimulus point to high inflation while those who believe US stimulus was warranted point to differences in GDP growth rates.

However, inflation statistics can diverge across countries for a number of reasons unrelated to aggregate demand. In this first piece of a series, we're going to walk through an overview of these reasons and demonstrate just how difficult it is to establish apples-to-apples comparisons between aggregate inflation measures in different countries. In future pieces, we will dive deeper into each of the reasons why inflation rates might differ across countries. That these comparisons prove tenuous should warn commentators and policymakers not to judge the effects of policy on the basis of this indicator alone.

Over the past 18 months, US inflation readings have consistently outpaced those in Europe. However, recently, inflation in Europe has nearly converged to US levels, largely due to rising food and energy prices in Europe.



These different paths have prompted attempts to attribute (some) of the

differences in inflation readings to differences in fiscal and monetary policies in the two regions over the course of the pandemic. For example, some commentators have argued that differences in core inflation measures, which strip out food and energy, are largely attributable to stronger fiscal support and aggregate demand recovery in the US, while differences in food and energy prices are due to stronger supply shocks in Europe related to the Russian invasion of Ukraine (itself an admission that prices of non-core components actually capture local supply-demand dynamics in addition to global price movements). While consumer demand and foreign supply shocks certainly play a role in inflation, they are far from alone. It is worth stepping back and taking full stock of the many reasons why inflation statistics may differ across countries.

As statistical constructs, price indices leave substantial room for variation. Different sources of price data, different definitions for similar goods, different means of aggregation and different household consumption patterns all have roles to play. Simple comparisons of inflation rates also assume away differences in economic structure between different economies, which in turn affect how similar sets of supply shocks or demand supports cash out into different price effects. To properly reckon where comparisons between countries might be valid, we first have to dive deep into the methodologies at work.

II. Inflation As A Statistic

The idea behind a price index is simple: for a particular subset of goods and services, find the weighted average of price changes over some time period. Figuring out how exactly to measure this in the real world is not quite so simple. For example:

- Where should the data for price changes come from, and how should price collectors ensure it is representative of the prices the index is interested in?
- Which prices should be included in the price collection process?
- How should price indices account for changes in product characteristics over time?

These challenges play out differently in different countries. Even when different countries are attempting to build the same kind of price index, the actual implementation varies. Not all countries have the same data collection abilities and data sources. As a result, statistical agencies will try to pick the approaches to price collection and measurement that they consider appropriate for their country.

Take, for example, the Harmonized Index of Consumer Prices (HICP). Throughout this piece, we will focus on the HICP because it is a readily available series often used for cross-country comparisons. The purpose of the HICP is to create comparable measures of national inflation in the Euro Area. To that end, the HICP process purports to harmonizes the price index methodology in terms of scope (that is, which goods and services to include), weighting methodology, aggregation methodology, and product categorization.

However, the further down one goes into the HICP creation process, the methodology becomes less prescriptive, and thus less harmonized. When it comes to actual price collection for finer-grained product definitions, the HICP manual often provides a menu of choices for statistical agencies to follow when it comes to data sources, sampling frequency, and aggregation methods. The <u>HICP</u> Methodological Manual explicitly states:

"...the regulations are not prescriptive about data sources. They leave it to individual countries to decide on the appropriate sources for gathering prices and the sampling methods to be used. This is because the most appropriate sampling and survey methods and best sources for the HICP price survey depend on local circumstances." [pg. 81]

The differences are even more pronounced when attempting to compare European and US HICP inflation measures. European data collection agencies are legally required to follow specific methodologies for price collection and index construction. By contrast, HICP measures developed in the US originate from a <u>research project</u> at the Bureau of Labor Statistics attempting to reconstruct an HICP-like series using already-existing data from the Consumer Price Index (CPI). This reliance on a different data source leads to differences in price collection, data availability, and aggregation effects with unpredictable effects.

Constructing the US HICP measure requires two major changes to the US CPI data, and vastly more minor ones. The first major change is the removal of owneroccupied housing from the CPI data to match the scope of the European HICP. The second is the addition of rural households to match HICP methodology. While the CPI data only measures urban consumers, the US HICP covers rural consumers by using weights from the Consumer Expenditure (CE) survey and proxies for rural prices using nearby small urban areas. These proxies may be appropriate for some items (like consumer durables) but not others (like rent).

Beneath these two high-level differences lies a deep and winding series of differences at the granular level. While these differences may each individually seem minor, serious differences may result at the aggregate level. Here, we provide a highly non-exhaustive list of the methodological differences that emerge as granularity increases.

Geometric vs. Arithmetic Means

In the US price aggregation at the lowest level (elementary aggregates) are generally constructed using a *geometric* mean of the sampled prices, while European prices can be constructed using either geometric or arithmetic means. For simple mechanical reasons, the arithmetic mean method gives higher weight to the price changes of higher-priced products.

Quality Adjustment for New Cars

In the European HICP, changes in the quality of new cars are adjusted for by "option pricing," which attempts to capture the value of quality adjustments to the consumer. Take, for example, a car that improves its fuel efficiency. In the HICP, that improvement is valued by calculating the fuel savings to a hypothetical consumer with some assumed mileage and fuel price. In the US, quality adjustment is based on the cost of the improvement to the manufacturer.

Rental Housing

Calculation of rental price inflation differs between Europe and the US in a number of ways:

- Utilities: In both areas, utilities are separated from rent when possible. However, some rental contracts do not explicitly separate rent and utilities. In the US, the CPI attempts to account for utilities in these rental contracts by estimating the cost of utilities using other data; in Europe, these utility costs are not accounted for if they are not explicitly separated from rent.
- Sampling Method: In the US, the sampling design follows housing units, not landlords or tenants. In Europe, the choice of sampling design is left to countries. Each sampling framework has its own advantages and disadvantages (following tenants is subject to turnover and spurious price changes due to moving; landlord registries can leave out small landlords), and price changes from one sampling method may not be comparable to another.
- Sampling Frequency: In the US, the BLS collects rental data from sampled units every 6 months. The price change for rent in a given month is therefore based on the 6-month change for rental units in the sample.
- Age Adjustment: In the US, the BLS adjusts rental rates for age; In the European HICP, there is no requirement to adjust rental rates for age.

Airfare

In the US, the data sample automatically only includes non-business travel, so both first-class and economy tickets are included in the sample. In Europe, the standard practice is to only include economy fares.

So What Does It Mean?

When commentators reach for international inflation comparisons, they rarely have the time or inclination to verify that the data are collected and constructed in such a manner that makes apples-to-apples comparisons possible. Even if the indices are designed to be comparable, the data fed into them may not be. These comparability measures exist in some of the largest components of aggregate inflation. It may not be immediately clear to what extent these differences matter, or in what direction. But their presence should give pause to those who take international comparisons of inflation statistics at face value.

III. Taxes and Price Controls

Government policies that *directly* affect prices – such as changes in taxes and price controls – also affect inflation statistics. Many countries have used VAT changes, either across the board or for specific goods, as part of the policy response to the pandemic and rising energy prices. In the second half of 2020, <u>Germany reduced its VAT from 19% to 16%</u>. Several countries, such as <u>Germany</u>, <u>Poland</u>, <u>Italy</u>, and the <u>Netherlands</u>, have responded to the rise in energy prices by substantially cutting fuel taxes in recent months, resulting in lower inflation readings.

One purpose of these policies is to affect consumer prices. To the extent that they are successful, they have a direct effect on consumer inflation readings. How much of an effect, though, is uncertain. It depends on whether companies decide to pass these tax cuts on to consumers when pricing goods. In any case, VATinduced price changes can't be used as evidence that differences in aggregate demand are driving differences in inflation.

Eurostat publishes a "constant tax rate" version of the HICP. This index measures how inflation would have evolved over the same period had VAT rates remained unchanged and changes in VAT passed completely through to consumer prices. In some countries, the difference between the headline HICP inflation rate and the constant tax rate inflation rate is modest, but noticeable:

Country	HICP Inflation	HICP Inflation, Constant Tax Rate
Poland	11.4%	14.3%
Netherlands	11.2%	12.8%
Belgium	9.3%	10.8%
Italy	6.3%	7.6%
Austria	7.1%	6.2%
Euro Area	7.4%	7.8%

12-month change in HICP, ending April 2022. Source: Eurostat Policy can have even more direct effects on inflation through government price setting practices. Many consumer prices, particularly in the energy sector, are set by, or strongly influenced by, government policy. <u>Hungary</u> implemented price controls on fuel in November 2021, and on food in February 2022. In 2022, <u>France</u> limited electricity price increases to 4% while <u>Spain and Portugal</u> have recently implemented price controls on natural gas. The prevalence of administered prices varies greatly country to country. <u>In general, administered</u> prices are less volatile and react less to oil price shocks than non-administered prices.

Governments can also exert pressure on prices they do not directly set. In the US, for example, <u>Medicare reimbursement rates have a large influence over private</u> <u>insurers' payment rates for similar services</u>. If the government establishes lower payout rates, private insurers often follow. Changes in private payment rates would be reflected in the CPI for health services, since price changes for medical services in the CPI include payments made by insurance companies.

All of this is to say that policy choices distinct from those involved in aggregate demand management can affect inflation statistics. Attempts to directly compare specific policies must take into account the rest of the universe of inflation-affecting policy decisions, a difficult task.

III. Weighting Differences

Differences in measured inflation between countries may be attributable to differences in economic structure. This problem is particularly acute when comparing price movements in sectors that have had dramatically different historical trajectories in different countries, such as housing or transportation. At a fixed point in time, this can be seen in the differences in weights assigned to categories of goods and services between countries.



Source: Eurostat

For example, the US and Europe differ in these areas:

- 1. *Transportation*: The US spends far more on transportation, in particular on automobiles. In part, this stems from differences in geography, taste, and transportation infrastructure.
- 2. Housing: The HICP includes rental housing, but not owner-occupied housing (aside from minor expenditures on repair and maintenance). The rate of homeownership varies greatly across countries, so statistically housing costs play an outsized role in countries with lower rates of homeownership, like Germany.
- 3. Private vs. Public Provision of Goods: the HICP excludes goods and services paid for by the government. Since a larger portion of education and health care are paid for privately in the US, education and health care comprise a larger share of the US HICP.

To the extent that a category carries an outsize weight in a country's aggregate inflation index, price changes in those categories likewise have an outsize influence on the aggregate series. For example, an oil price shock might affect aggregate inflation more in countries where oil comprises a larger share of consumer expenditures, even with similar aggregate demand conditions. A global pandemic likely plays a larger role in determining aggregate inflation in countries where consumers bear a larger share of the burden of health care costs.

One way to try to account for these differences is to compare inflation rates of two regions but use the same weights for each component. In the Figure below, I calculate the contribution of 2-digit COICOP categories to the overall inflation rate in Europe, and compare it to the contribution of those categories to the inflation rate in the US I then repeat this exercise but using the US expenditure weights with underlying European component growth rates.



Source: Eurostat, Author's Calculations.

The differences in the contributions of food, energy, and transportation between the two areas is muted when the weights are equalized. In other words, at least some of the difference in inflation patterns between the two areas can be accounted for simply by the fact that the US spends more on automobiles, and Europe spends more on food, housing, and gas. The simple disparity in the importance of different categories of expenditures means that each area will have different exposure to price pressures in those categories.

V. Structural Differences

Different countries have different structures of production and consumption, which can produce divergent responses to similar shocks. For example, the

inflationary effects of a global auto shortage may manifest itself more strongly in the US than in Europe. Transportation in the US is more car-centric and the infrastructure available makes it substantially more difficult to substitute other forms of transportation as compared to Europe. At the same time, given the absence of secure domestic sources of baseload power and heat generation, Europe is more acutely vulnerable to the structural effects of a natural gas shortage, both through its effects on utility gas service and electricity generation.

Individual prices for consumer goods and services are determined by the interaction of supply and demand in specific markets. To the extent that the structure of demand and supply differ across sectors and countries, so too will the reactions of these prices to similar shocks or policies. For example, if demand for a particular good in a particular country is highly inelastic, supply shocks to that good will have a strong effect on prices for that particular good. Likewise, if supply chains for a good are highly constrained and inelastic, an increase in demand may lead to an outsized contribution to aggregate inflation from that good.

That's why it's important to go beyond comparing aggregate measures of inflation, and take a look at what is going on at the component levels. As we have written about before, what the pandemic has shown us is that many of today's inflationary pressures can be traced back to specific physical capacity constraints at particular points along the supply chain. We saw this before with <u>durable goods inflation</u> in the US, and we are seeing it now with <u>elevated natural gas</u> prices in Europe.

However, much existing commentary waves these differences away. It is often argued that micro-level price movements are only informative of changes in relative price, while macro-level price movements are purely determined by the levels of aggregate demand and supply. As we have demonstrated before, it is bad methodological practice to ignore these micro-level price movements. Empirical evidence for inflation should include the observation of specific prices (even to validate macro-level causes), rather than simply relying on dubious and incoherent measures of theoretical aggregates like "aggregate supply."

Commentators already often strip out food and energy when analyzing inflation, arguing that those specific components are more volatile, more sensitive to supply shocks, or otherwise less representative of dynamics within "aggregate demand." However, the decision to construct this particular aggregate requires that we reason from microeconomic data points. This is not to say that general equilibrium and aggregate demand dynamics play no role in determining aggregate inflation, but rather an acknowledgment that developing a usable understanding of the movement of aggregate inflation will require a causal understanding of the underlying components.

Simply attributing differences in inflation to differences in aggregate demand tacitly assumes that the structures of production and consumption between different countries are comparable, sometimes collapsing sharp differences purely for the convenience of comparability. To the extent that the structure of consumption and production vulnerabilities differ between countries, inflationary patterns may also differ as countries run up against their own various specific points of inelasticity when economies experience demand changes or supply shocks.

Exercise Caution!

Inflation is much more complicated than it seems at first glance. The construction of statistical aggregates is a monumental task that involves a myriad of difficult decisions, statistical assumptions, and rough equivalencies. Statistical agencies use methods that are particular to their own countries and any direct comparisons of aggregate inflation should be taken with a large grain of salt. The determinants of statistical measures of inflation are numerous. Individual prices are determined by numerous factors, such as market structure, supply constraints, and taxes, to name a few. Overall inflation statistics, which are constructed by aggregating those individual prices, are thus also determined by those same forces. To be clear, aggregate demand is important—but so too are other factors.

Rather than quantitatively exact apples-to-apples comparisons, a comparison between the rate of inflation in two different countries is a bit like a comparison between the cost of going out to get an average lunch in those countries. Countries with many vegetarians will find the cost of lunch less sensitive to changes in the price of meat, while countries that only have drive-through windows will be more sensitive to changes in the price of gasoline. Maybe one country includes the accompanying drink in the definition of lunch while the other does not.

Commentators and policymakers need to exercise caution when attempting to compare inflation readings from different countries. This is not to make the purely nihilistic point that inflation readings mean nothing. Rather, this is a call to recognize that inflation statistics see input from a varied array of factors, and that attributing differences in measured inflation solely to different levels of broad aggregate demand is difficult to support. This should also give pause to the desire to use broad tools of aggregate demand management, such as interest rate hikes, to tame inflation.

Understanding aggregate inflation and cross-country differences requires grappling with the multitude of factors that affect inflation. This will be the subject of our future pieces in this series on global inflation. In doing so, we will exercise caution and acknowledge that it may not always be possible to precisely measure the effects of each factor. However, this approach is preferable to blindly attributing all differences in aggregate inflation to aggregate demand.