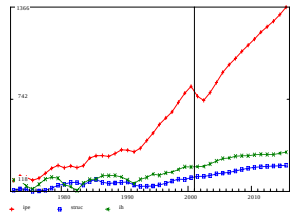

The Inforum *LIFT* Model: Analysis of Illegal Immigration

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Inforum Interindustry-Macroeconomic (IM) Models

- Combine input-output structure with econometric equations in a dynamic and detailed framework.
- Like a CGE: Contains detailed industry structure and *bottom-up* accounting.
- Like an (macro) econometric or VAR model: Parameters estimated from actual data. Portray dynamic evolution of economies over actual time periods.
- Lift (Long-term interindustry forecasting tool) is 97 sector flagship model. Under continuous development and use for over 30 years.
- Iliad - detailed 310 sectors.
- International System: BTM bilateral trade model, IM models for all major trade partners including China.

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LIFT: Inforum's Model of the U.S. Economy

LIFT stands for **L**ong-term **I**nterindustry **F**orecasting **T**ool.

LIFT is an interindustry-macro (IM) model.

- **Sectoral detail** for production, prices, jobs, consumer spending, foreign trade and factor income (wages, profits, depreciation, etc).

- **Macrovariables**. Many, such as GDP, net exports, the unemployment rate, and the aggregate price level are aggregates of the underlying industry forecasts. Other macrovariables such as the savings rate and interest rates, complete the model.

LIFT is particularly useful in addressing questions involving interactions between industries, as well as the interplay between industry and macroeconomic relationships.

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The *LIFT* Philosophy

Bottom-up

Aggregates are summations of detailed industry results.

Consistent

The NIPA and IO frameworks ensure consistency. The patterns of expenditures by industry affect employment by industry. Prices reflect unit costs of materials, labor and other factor income (profits, depreciation, indirect taxes, etc.)

Econometric Relationships

LIFT is based on empirically estimated relationships, using detailed historical data, based on long time-series.

Dynamic

LIFT models economy year by year. The time path of response is important. Many equations use distributed lags, so effects of shocks build up and decay over time. Input-output coefficients change over time, in response to estimated trends or exogenous assumptions.

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The Major Components of *LIFT*

Input-Output Tables

Input-output tables provide the accounting identities that define sectoral output and prices.

The Product Side

The expenditure side of the model is comprised, by industry, of final demand components production in constant dollars, hours worked and employment. $\mathbf{q = Aq + f}$

The Nominal Income/Price Side

The income price side is comprised by industry of 13 types of factor income (value added). Prices are consistent with value added and intermediate materials cost. $\mathbf{p' = p'A + v}$

The Accountant

The Accountant calculates numerous aggregates of industry detail, NIPA identities, (such as the government surplus or deficit, personal and disposable income) and interest rates.

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Recent Studies Using LIFT

Impact of Container Trade Interruptions - CBO

Impact of High Natural Gas Prices – Department of Commerce (ESA)

Impact of Currency Fluctuations – Department of Commerce (ITA)

Sustainability of Long-term Projections - Centers for Medicare and Medicaid Services

Static & Dynamic Effects of Trade Liberalization – Manufacturers Alliance

The Digital Economy 2000/2005 - Department of Commerce (ESA)

Impact of Asian Crisis on the U.S. Industries - Manufacturers Alliance

Impacts of Defense Expenditures - Department of Defense

Force Mobilization Capabilities - Institute for Defense Analysis

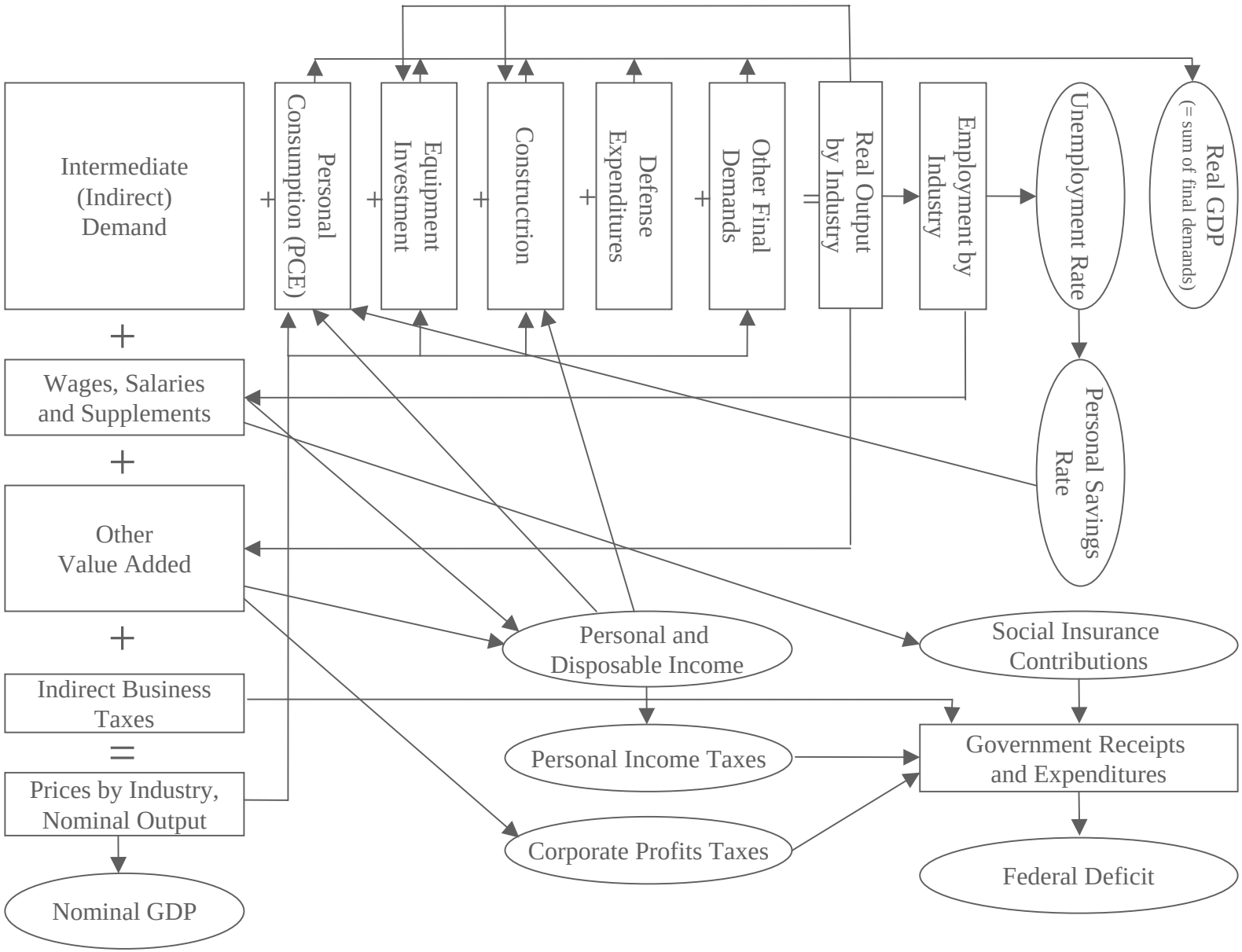
Local Impacts of Electricity Deregulation - National Rural Electrical Cooperative Association

China in the WTO - U.S. Government

Effects of Slow Growth in Japan - U.S. Government

Clean Energy and Jobs - Center for a Sustainable Economy

Schematic of the Inforum Lift Model



Immigration Analysis

- In many ways, quantitative analysis of immigration is similar to looking at free trade.
- Static comparative advantage: Does immigration's impact on relative prices enhance a more efficient distribution of (global/national) resources?
- Dynamic impacts: Does immigration help induce productivity enhancing "x-efficiencies"? (economies of scale, competition, monopoly power erosion, etc.)
- Other enhancements that are hard to quantify: Diversity, quality, flexibility, opportunity, technology dispersion.

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Illegal U.S. Immigration as Special Case

LIFT Simulation:

- Assume that 7.2 million workers are deported for labor force over 2007. With dependents, population falls by 12 million.
- Wages rise and employment reduced most dramatically in most affected sectors (using Pew study): Agriculture, Food, Construction, Hospitality, Apparel, Domestic, etc.
- These are relatively low-productivity positions (~1/2 avg).
- Domestic demand (consumption, construction, trade) adjusted accordingly.

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Macro Fixes

Fixes to Macro Variables

- Reduce population and labour force.
- Reduce personal transfers to foreigners.
- Reduce spending on schools.
- Increase money supply.
- Reduce consumption spending.
- Reduce employment of domestic servants

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Vector Fixes

Fixes to Vector Variables

- Slower aggregate investment growth.
- Higher imports of non-oil goods and agriculture.
- Less Residential and Nonresidential Construction.
- Less employment and higher wages in affected industries: Construction, Hotels, services.
- Lower consumption of affected products: Hotels, Restaurants, Domestic services, Personal services, Food.

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Comparative “Static” Results

Short-term (through 2010):

- Abrupt adjustment creates trauma (potential recession).
- Lower investment (housing particularly hit).
- Higher wages, inflationary conditions.

Long-term (through 2020):

- Adjustment to lower levels of employment and GDP
- Higher labor force participation
- Higher aggregate productivity (reallocation of labor to more productive sectors)
- Mildly higher income per capita (for remaining population).

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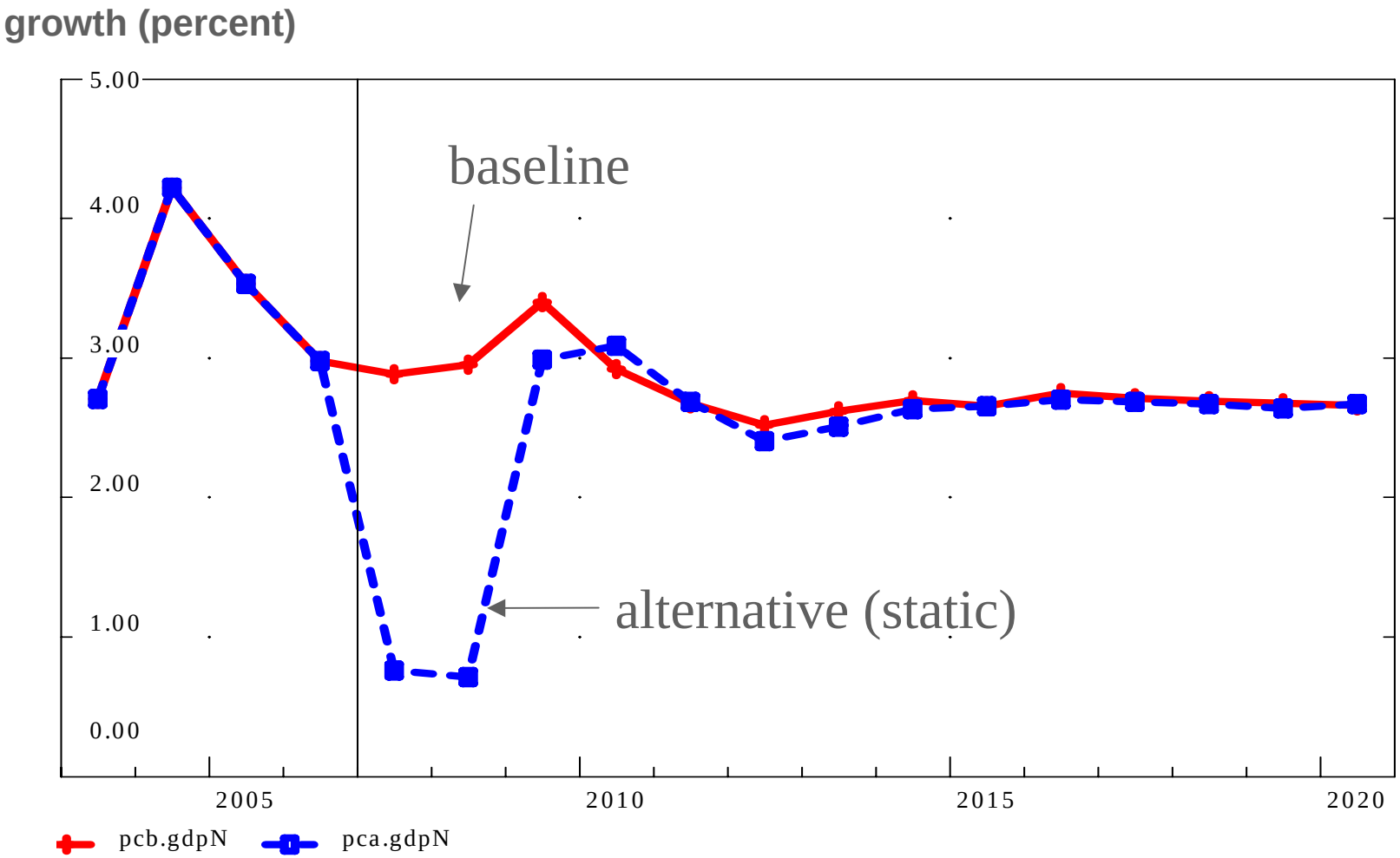
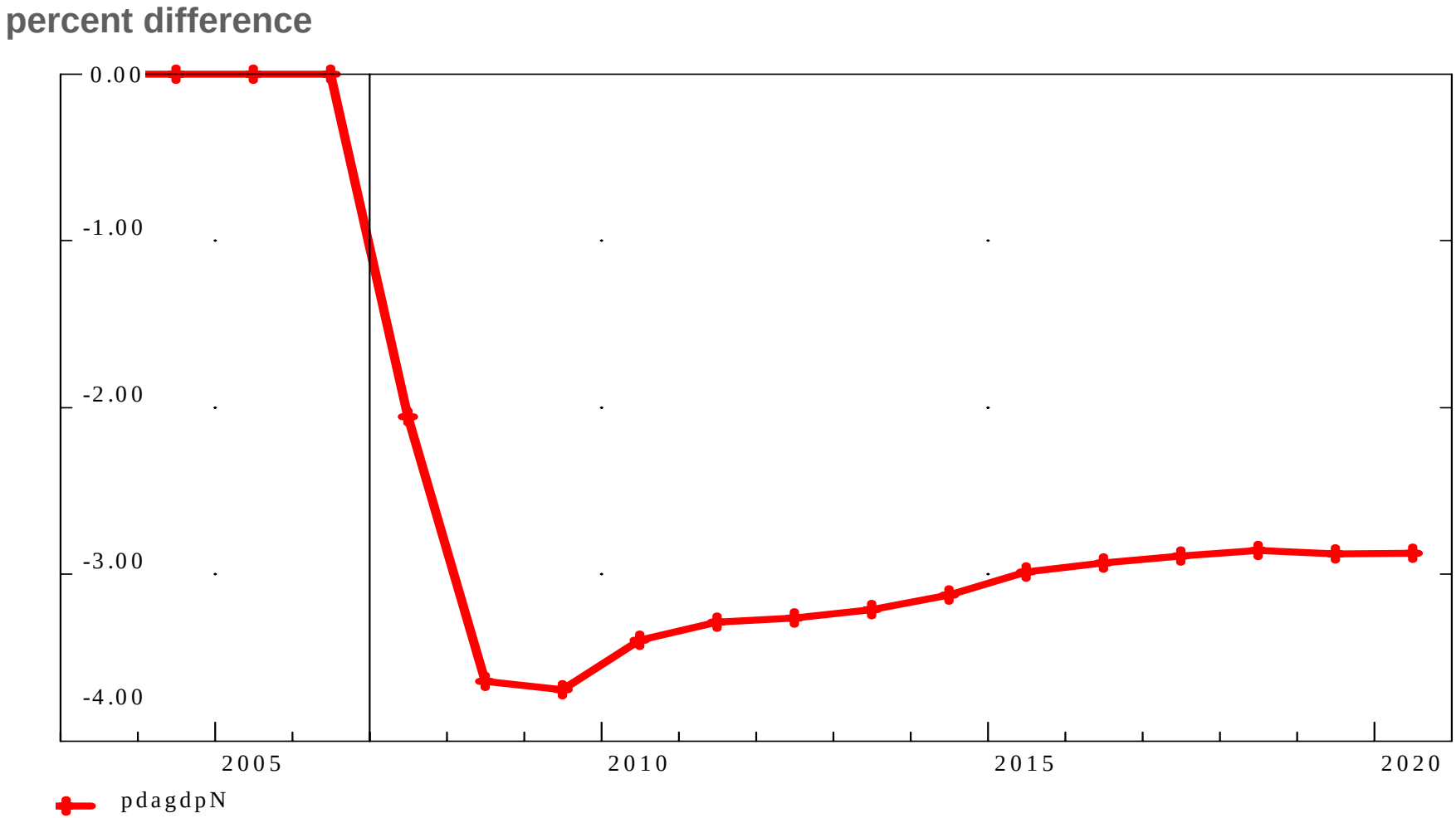
Difference in GDP Growth (static)

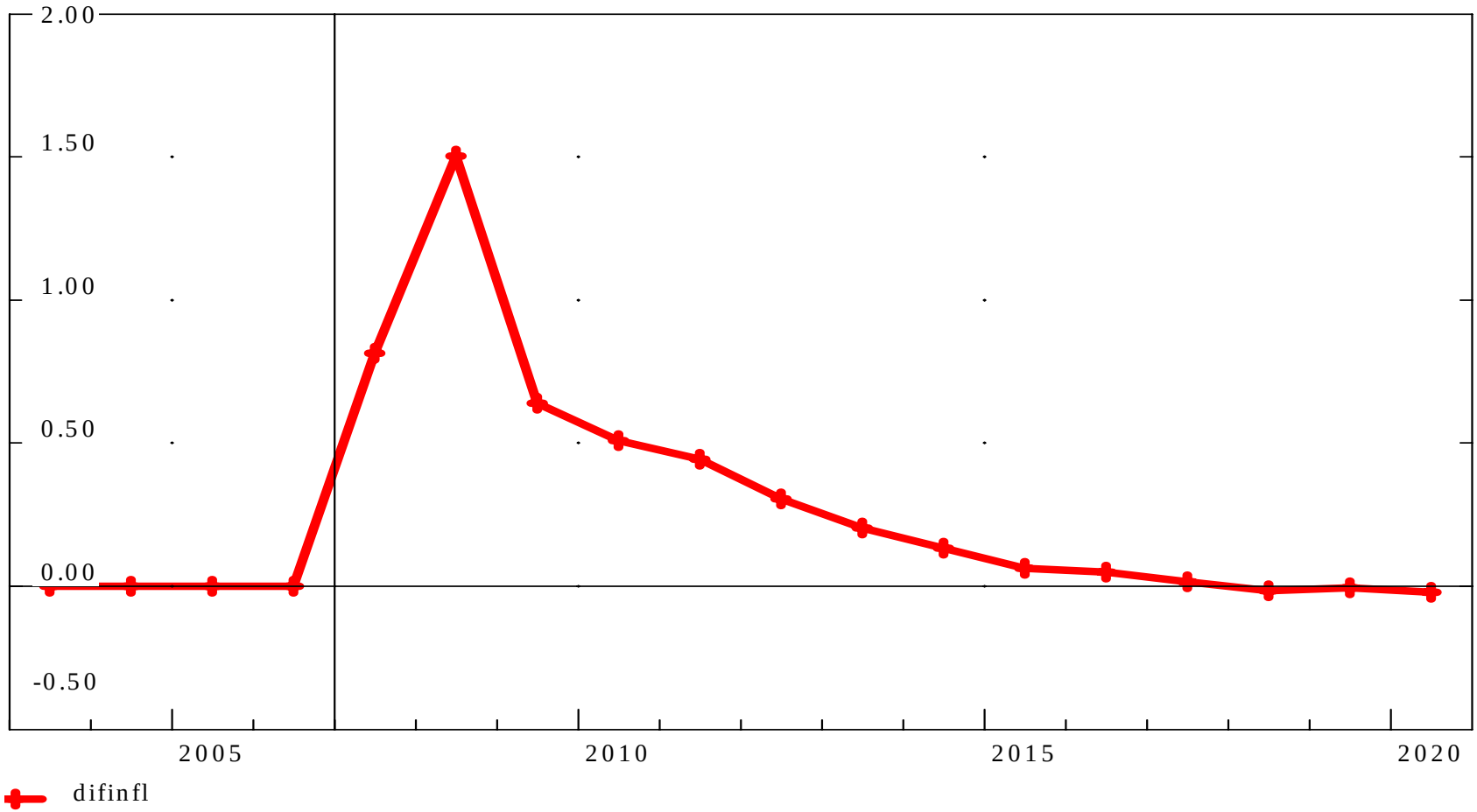


Difference in GDP level (static)



Difference in GDP inflation (static)

difference in inflation rate



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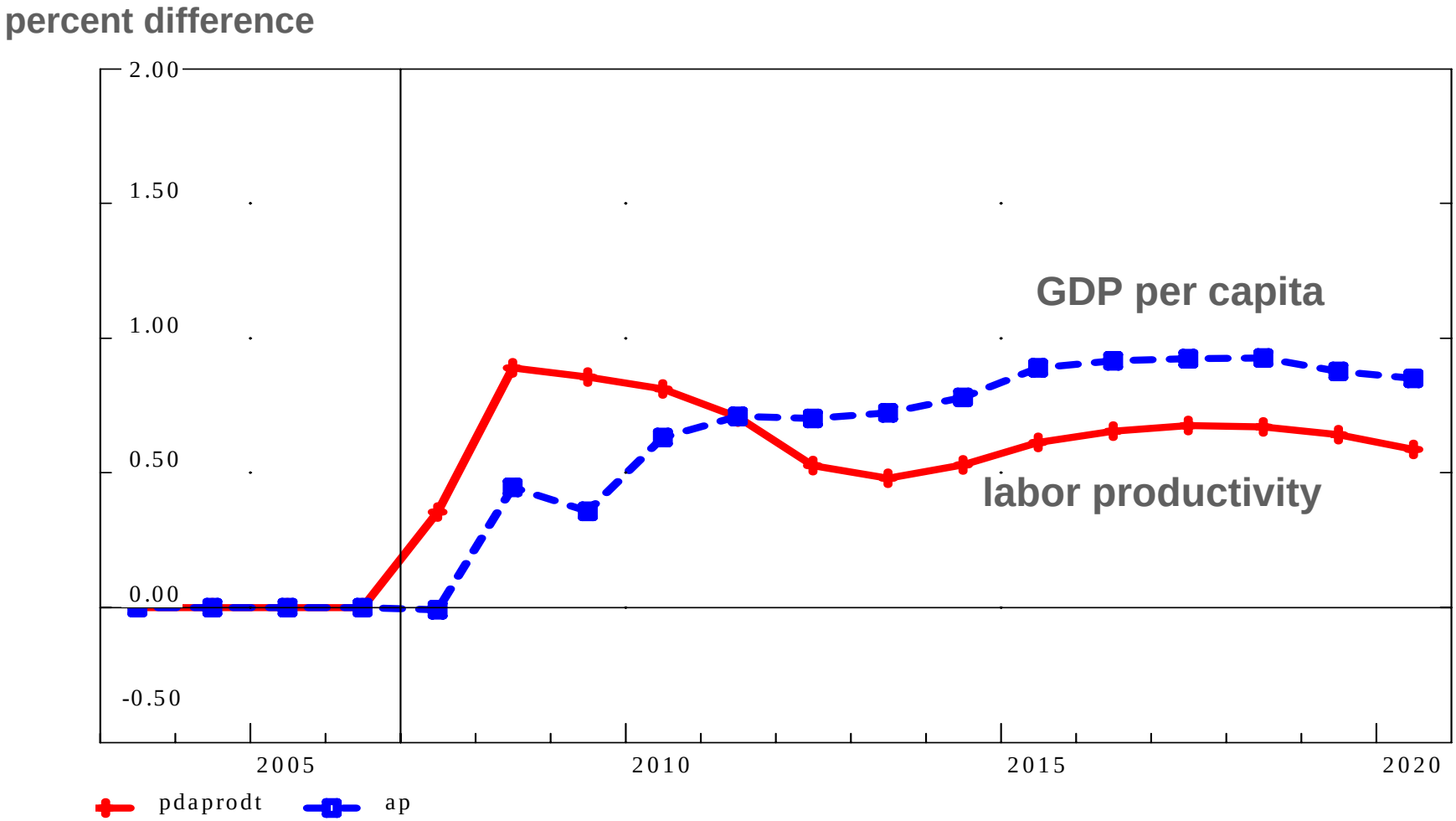
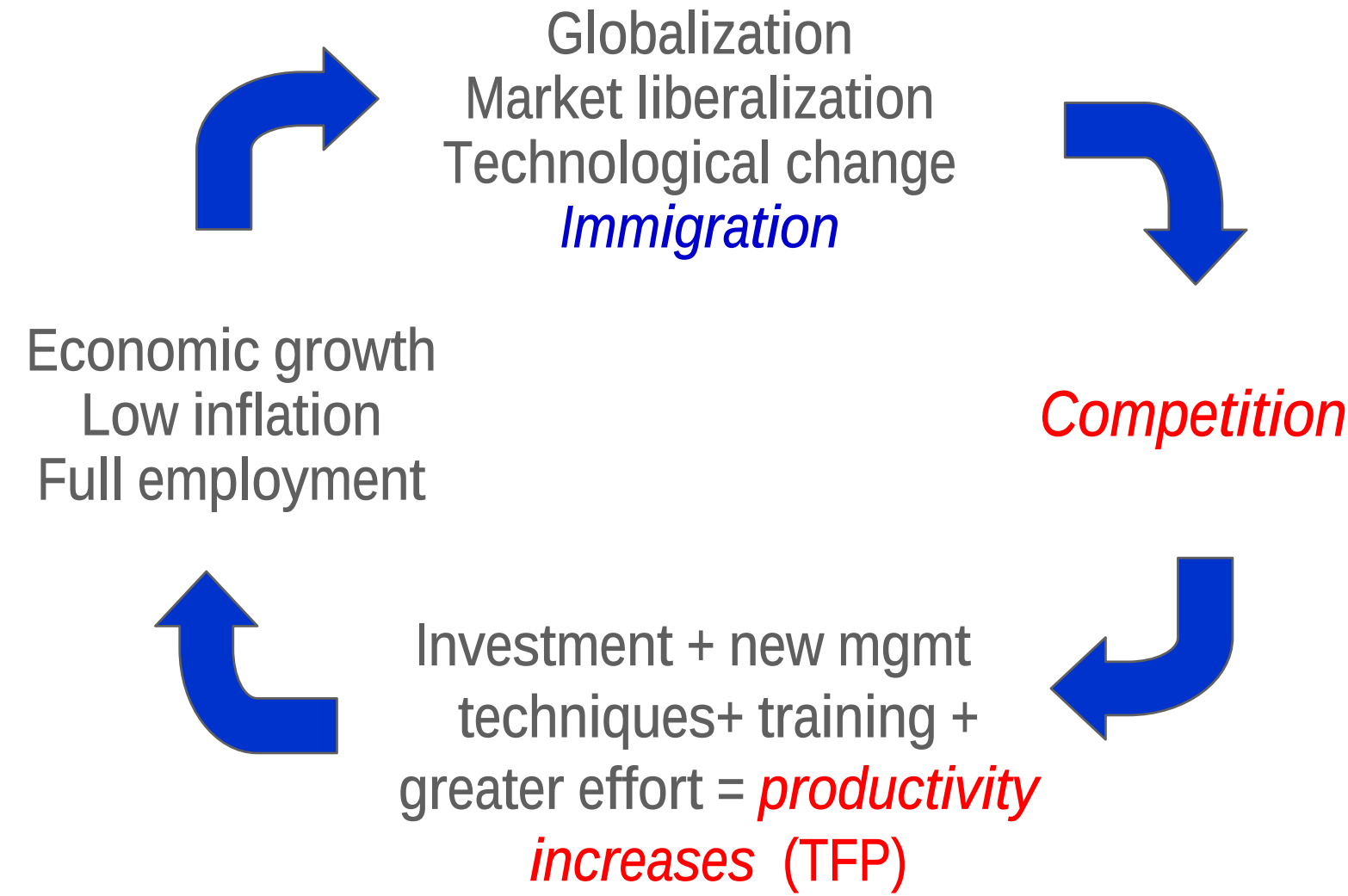
Difference in Labor productivity and GDP per capita (static)



A new economy?
Intensified competition induces "creative destruction."



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X-efficiencies are TFP enhancing factors not accounted for in typical comparative static exercise.

X-efficiencies of immigration:

- Larger labor force encourages economies of scale (construction, leisure).
- Erosion of monopoly power (unions) and other rent-seeking behavior (taxis).
- Lower relative wages increases investment in technology enhanced capital (FDI).
- Competition in labor market induces harder and longer work (especially by natives).
- Immigrants have important embedded qualities (risk-taking, creative).
- ***Implies very significant distributional consequences.***

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Assume X-efficiencies go away with the illegal immigrants: "Dynamic" results

Reduce productivity growth across economy, particularly in most effected sectors (construction, services) *The magnitude of this improvement is speculative (with trade we often find some estimates).*

Immediate shock is similar, but in intermediate to long term:

- GDP doesn't "heal," it is significantly lower in long term.
- Higher inflation entrenched longer.
- Exports less competitive.
- Lower aggregate productivity.
- Lower income per capita.

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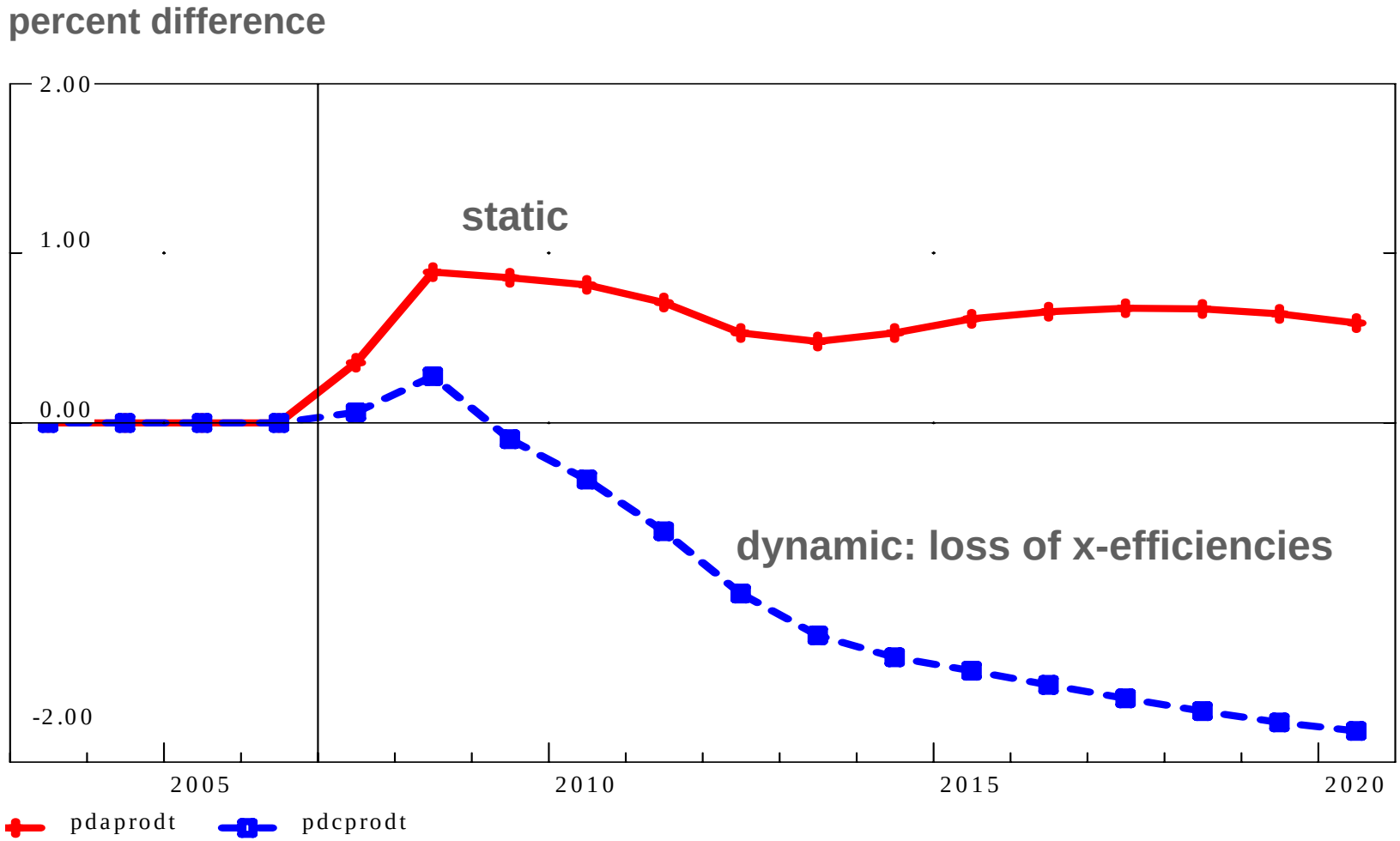
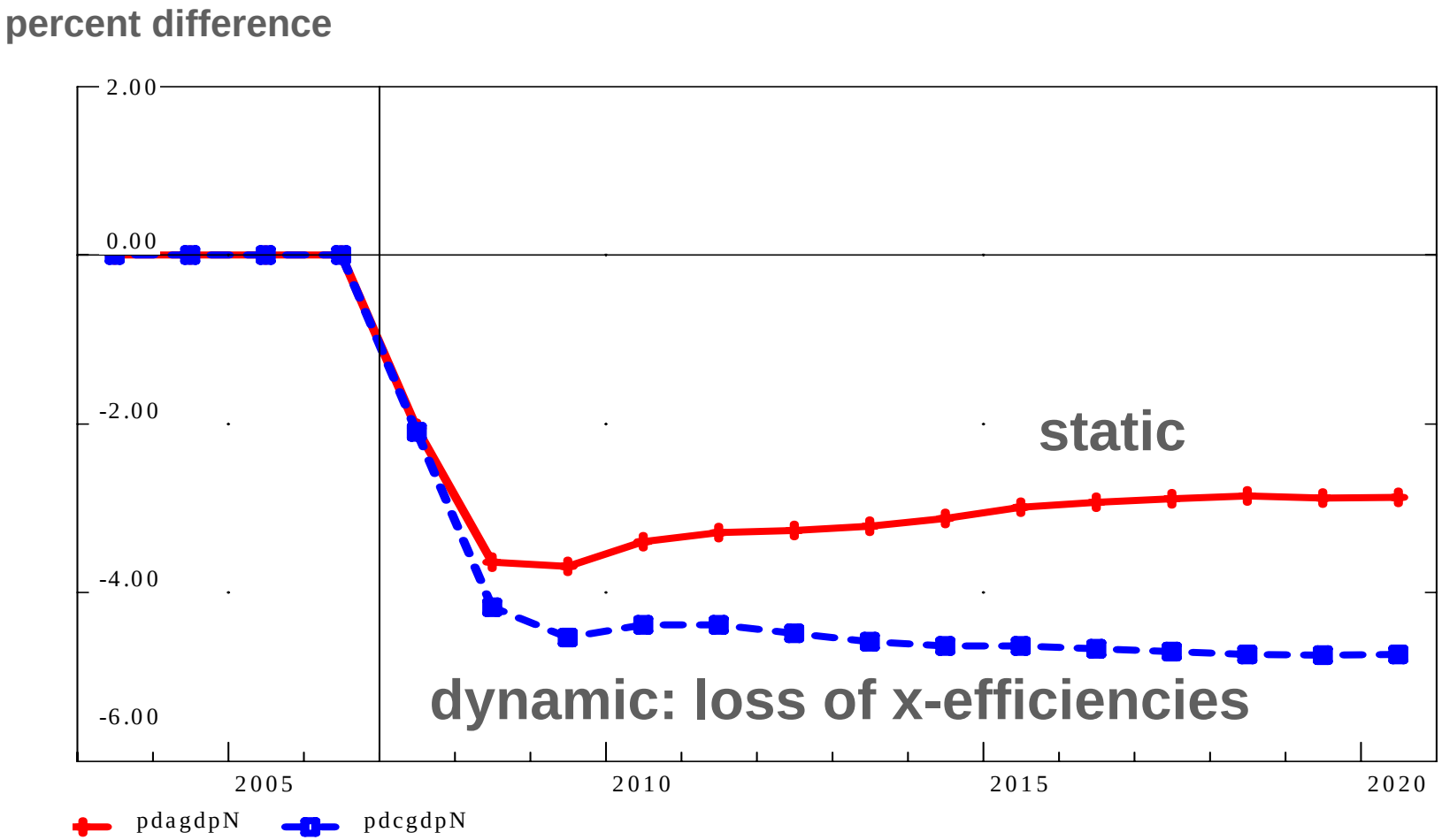
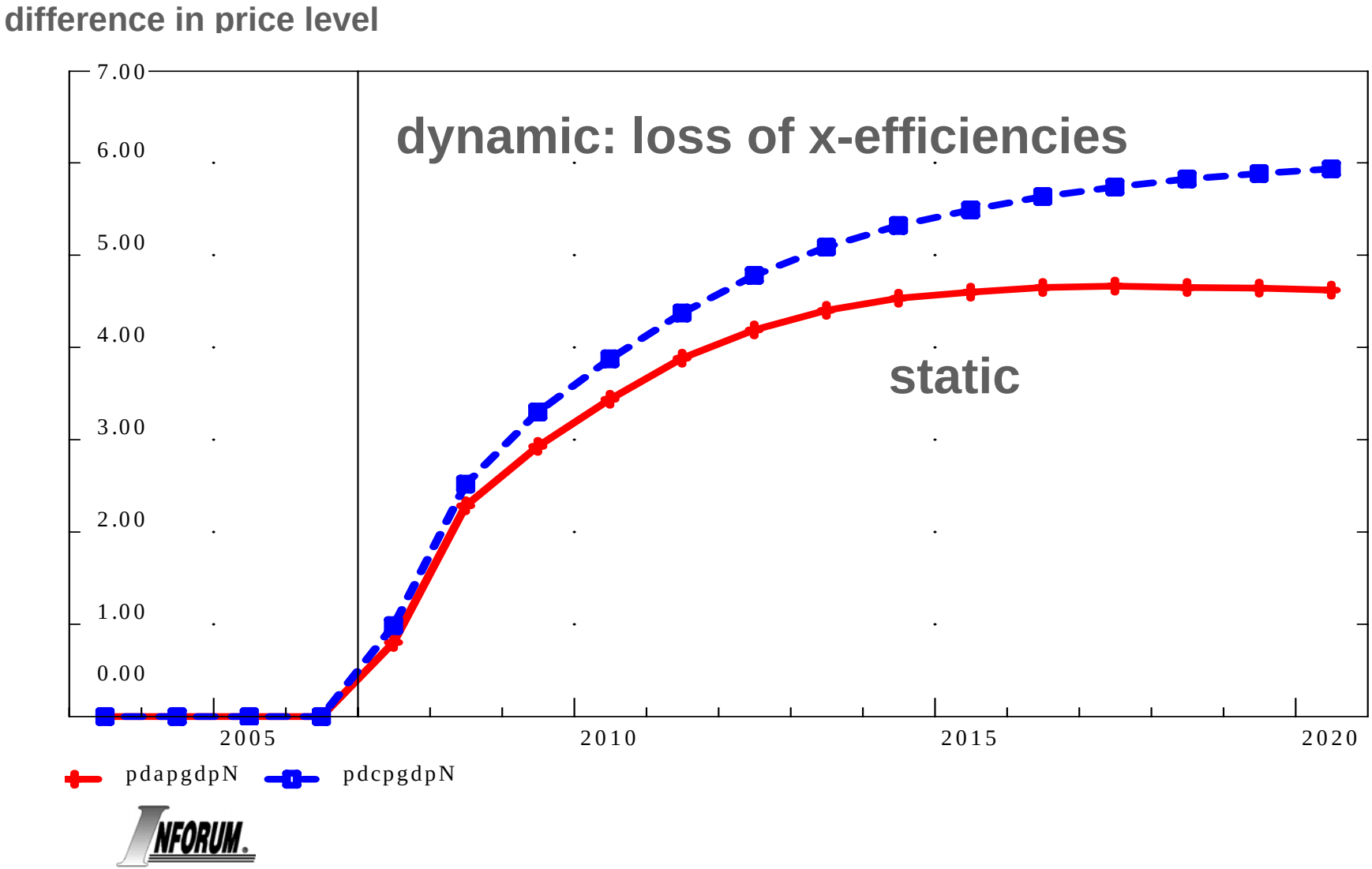
Difference in Labor productivity (static vs. dynamic)



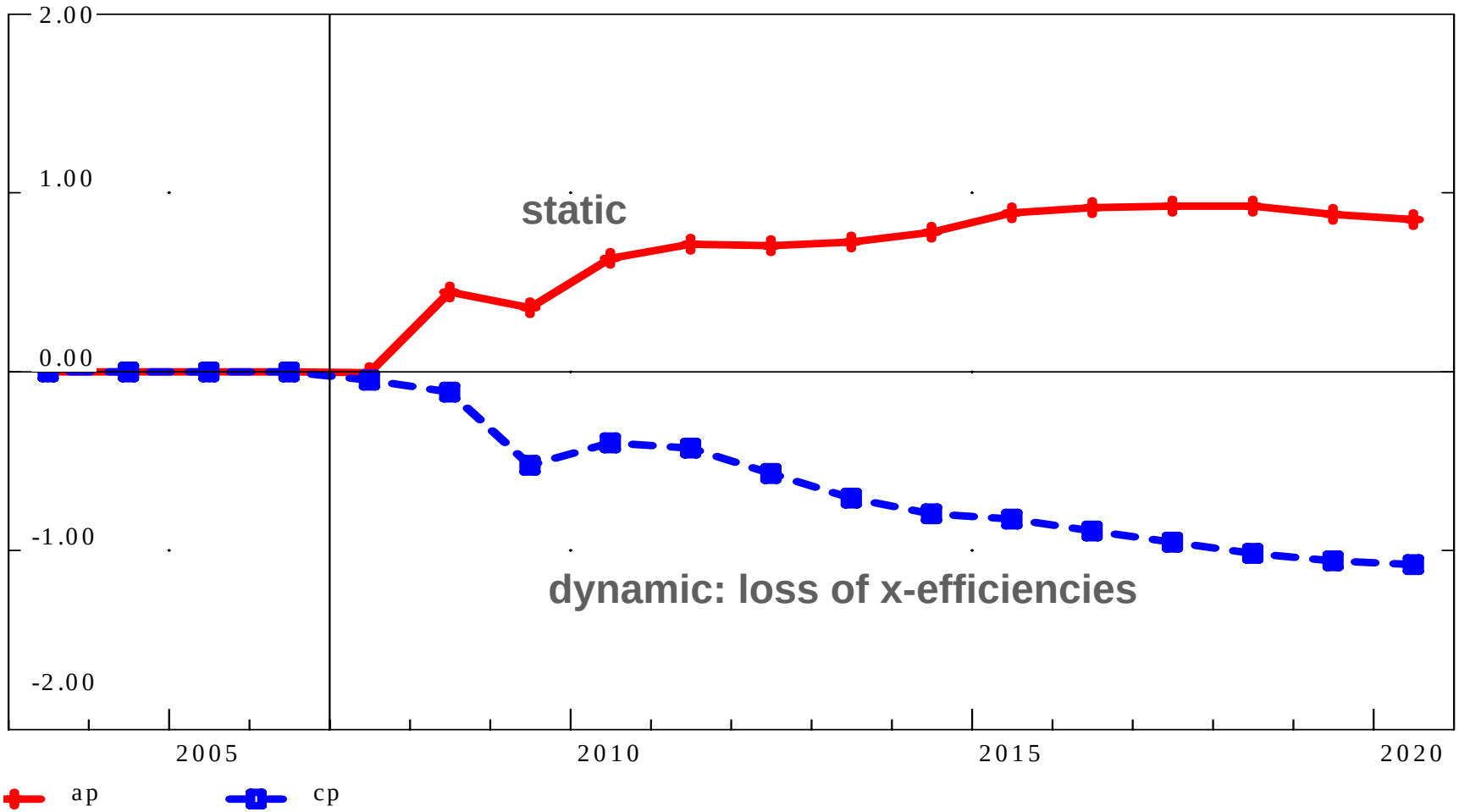
Difference in GDP level (static vs. dynamic)



Difference in GDP prices (static vs. dynamic)



Difference in GDP per capita (static vs. dynamic)



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Conclusion

The Bad:

- Effects of reducing illegal immigration are hard to determine.
- Quantitative results depend heavily on assumptions.

The Good:

- Many questions remain unanswered, and so much work remains to be done.

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