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BRIDGING THE COVID-19 RECESSION: THE DON PATINKIN LECTURE

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Abstract

Policymakers in the COVID-19 era face two critical challenges. First, they must design policies that improve the tradeoff between economic activity and health outcomes. Second, they must design policies to reduce the long-run damage that a COVID-19 induced recession inflicts on the economy. This paper briefly discusses appropriate responses to those challenges.

1. INTRODUCTION

Most governments responded initially to the COVID-19 crisis by implementing simple measures to contain the epidemic. Eichenbaum, Rebelo and Trabandt (ERT) (2020a,b) argue that these policies imply a sharp, negative tradeoff between the level of economic activity and the health consequences of an epidemic. While beneficial from a health perspective, brute force, simple containment measures are not politically sustainable. The economic pain is simply too large. Policymakers in the COVID-19 era face two critical challenges. First, they must design policies that improve the tradeoff between economic activity and health outcomes. Mandatory masks and measures to protect the old are obvious examples of such policies. Less obviously, smart-containment policies that combine testing and quarantines dramatically improve the tradeoff. Second, policymakers must design policies to reduce the long-run damage that a COVID-19 induced recession inflicts on the economy. These policies will certainly be expensive and drive up short-run government deficits. But the social rate of return on those programs almost certainly exceeds the associated costs. Israel should not be paralyzed by a myopic focus on current deficits.

This lecture shares my thoughts on these two challenges. I pay particular attention to the economic policy questions arising from the COVID-19 epidemic. This focus seems fitting in light of Don Patinkin's life-long devotion to using economics to design better public policy. In Section 2, I discuss the interaction between the economic and health consequences of the

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COVID-19 epidemic. Section 3 briefly assesses the fiscal risks to Israel of building an economic bridge over the COVID recession. Section 4 contains concluding remarks.

2. EPIDEMICS AS SIMULTANEOUS SHOCKS TO AGGREGATE SUPPLY AND DEMAND

Building a bridge over the COVID-19 recession will require inputs from different disciplines. Epidemiology models will certainly play an important role in the process. But it won't suffice because those models don't allow for interactions between peoples' economic decisions and rates of infection. The absence of these interactions in epidemiology models limits their usefulness for forecasting and policy analysis. Not surprisingly, the COVID-19 crisis has led to an explosion of work combining economics and epidemiology. Space constraints prevent me from reviewing this work. Instead I will focus on my own work and refer the reader to my papers for further references.

An epidemic gives rise to negative shifts in aggregate supply and demand (see ERT 2020a,b,c). The supply effect arises from the fact that an epidemic exposes people who are working to the virus. People react to that risk by reducing their labor supply. The demand effect arises from the fact that consumption activities expose people to the virus. People react to that risk by reducing their consumption. Working in tandem, these supply and demand effects generate a large, persistent recession. So an epidemic would lead to a severe recession even if the government didn't institute any containment policies at all. See Chetty, Friedman, Hendren and Stepner (2020) and Goolsbee and Syverson (2020) for empirical evidence in favor of this claim.

In the classic epidemiology model proposed by Kermack and McKendrick (1927), the population is divided into four groups: (i) susceptible (people who haven't been exposed to the disease), (ii) infected (people who have contracted the disease), (iii) recovered (people who have survived the disease and have acquired immunity), and (iv) deceased (people who have died from the disease). Transition probabilities between states are exogenous.

In contrast, transition probabilities in ERT (2020 a,b,c), reflect, in part, people's choices regarding market activities. New infections arise from consumption-based activities and work activities as well as non-economic social interactions. The number of newly infected people is given by the transmission function:

(1) $$T_t = \pi_1 \left(S_t C_t^S\right) \left(I_t C_t^I\right) + \pi_2 \left(S_t N_t^S\right) \left(I_t N_t^I\right) + \pi_3 S_t I_t.$$

Here I_t and S_t denote the time t fraction of the population that is infected and susceptible, respectively. The variables N_t^S and N_t^I denote hours worked by susceptible and infected people, while C_t^S and C_t^I denote the consumption expenditures of susceptible and infected people. The terms $S_t C_t^S$ and $I_t C_t^I$ are the total consumption expenditures of susceptible and infected people, respectively. The parameter π_1 reflects the amount of time spent shopping and the probability of becoming infected as a result of those activities. The terms $S_t N_t^S$ and $I_t N_t^I$ represent total hours worked by susceptible and infected people, respectively. The parameter π_2 reflects the probability of becoming infected as a result of work interactions. The number of random meetings between infected and susceptible people is $S_t I_t$. These interactions result in $\pi_3 S_t I_t$ new infections.

People make their decisions knowing (1), i.e., they understand how infections are transmitted.[1] Other things equal, people reduce their consumption and hours worked in response to the danger of becoming infected.[2] Critically, people take the aggregate number of infections as given and unaffected by their individual actions. So there is an externality associated with a virus, analogous to the one associated with pollution. Our collective actions affect the total amount of pollution. But everyone takes the total amount of pollution as given, so they don't internalize the full social costs of their individual activities. The classic solution to this type of externality is a Pigouvian tax. Just as it is socially optimal to tax polluting activities, we should tax market activities during an epidemic. The case for externalities is even stronger when we take into account that the health system can become overwhelmed during an epidemic. ERT (2020a) capture this effect by assuming that death rates are a convex, increasing function of how many people are infected. This 'overcrowding' problem magnifies the externalities associated with infections.

Figure 1 displays the impact of an epidemic in the model economy of ERT (2020a). Here we adopt the calibration used in ERT (2020b) to ease comparability across the two papers. The solid blue line depicts the aggregate dynamics absent any government intervention. Note that an epidemic generates a large number of deaths (totaling roughly 0.16 percent of the initial population) *and* a large recession, with an average, peak-to-trough, decline of about 7 percent of real GDP.

What policies should a welfare-maximizing government pursue to deal with the infection externality? Suppose that the government can't treat people as a function of their health status. ERT (2020A) investigate the nature of the optimal uniform tax on everyone's consumption. The dotted line in Figure 1 depicts the solution to what we call the optimal simple-containment policy.[3] The policy leads to an initial 40 percent tax on consumption, rising to almost 80 percent. The initial jump reflects the interaction between the dangers of overwhelming the medical system with the possibility that vaccines and treatments will, at

[1] This assumption is clearly not literally true. Still it allows us to capture formally the idea that most people understand the general health risks associated with market activity during an epidemic.

[2] ERT (2020a) assume that people are effectively 'hand-to-mouth' consumers because they don't have a way to smooth consumption over time. ERT (2020c) extend the model so that people can smooth consumption by investing in capital. The model also allows for nominal price rigidities.

[3] The objective function in this problem is the weighted average of people alive at beginning of epidemic.

some point in the future, become available. After the initial jump, the tax mirrors the infection itself because the size of the externality reflects the fraction of the population that is infected.[4]

The optimal simple-containment policy makes the recession *worse* than the no-intervention equilibrium. The average peak-to-trough fall in real GDP is roughly 17 percent, compared to 7 percent in the no-intervention equilibrium. People certainly suffer from this aspect of policy. But the policy improves welfare because it saves an enormous number of lives. Figure 1 indicates that about 0.12 percent of the population dies from the epidemic as compared to 0.16 percent in the no-intervention equilibrium.

Given their large economic costs, the political pressures to abandon policies like simple containment have proven to be unbearable. Numerous countries, including the US, prematurely abandoned initial containment measures. ERT(2020a) analyze the results doing so. The results are depressingly predictable: a short-lived economic revival is followed by a surge in infections, epidemic-related deaths and a subsequent recession.

The last set of results makes clear the necessity of finding policies that improve the tradeoff between health and economic outcomes. A natural class of policies involves testing people for their health status. There are two reasons for a government to engage in such testing. The first is to obtain better estimates of how many people have been exposed to the virus and refine estimates of key parameters in epidemiology models. The second is to reduce transmission rates by quarantining infected people. ERT (2020b) focus on the second and argue that testing alone doesn't resolve the key market failure associated with epidemics. Testing must be combined with quarantines.

There are two types of people in the model analyzed by ERT (2020b). The first group consists of people outside the testing pool who have not yet been tested. The second group are inside the testing pool and get tested every period until they recover or die. In every period the government tests α percent of the first group. So the size of the first group falls over time while the size of the second group rises over time.

Testing without quarantines in this framework actually worsens the economic and health consequences of an epidemic. The reason is straightforward. People who are unsure about their health status reduce their economic activity to lower the risk of becoming infected. If such people get tested and find out that they are infected, they reduce their economic activity by less than if they don't know their health status. There's just less to lose from consuming and working once you know you are infected. With more infected people engaging in economic activity, social interactions become more risky for non-infected people. The latter respond by cutting back on their economic activity. Given ERT's calibration, the net result is a deeper recession and more deaths compared to a no-testing scenario.

[4] ERT also consider a planning problem in which the government can tell people how much to consume and how much to work, subject to the constraint that all people are treated the same way, regardless of health status. The solution to this problem is very similar to the optimal simple-containment policy.

Suppose we use test results to implement the following policy: infected people aren't allowed to work, receive consumption from the government, but they are allowed to engage in non-economic social interactions. We refer to this regime as a simple-quarantine policy. In contrast, a strict-quarantine policy imposes the additional restriction that infected people are isolated from non-economic social interactions. In the benchmark calibration of ERT, α is equal to 2 percent, so that, under both policies, by the end of the first year, 59 percent of population is tested every week. Under the simple-quarantine policy, the population reaches herd immunity at the end of the first year and testing can stop. Under the strict-quarantine policy, many fewer people get infected and the economy never reaches herd immunity. Testing and strict-quarantining have to be deployed on a permanent basis until effective treatments or vaccines are developed.

Both quarantine policies would be very expensive. But they both *dramatically* improve the tradeoff between economic activity and health outcomes. Compared to the non-intervention economy or non-test based simple containment policies, there is a much smaller recession. The reason is straightforward: quarantining infected people removes them from social interactions related to consuming and working. The resulting reduction in the risk of being infected leads to higher consumption and work by everyone who is at risk of becoming infected. Recall that in the no-intervention and simple containment economy, the average peak-to-trough fall in real GDP is roughly 7 percent and 17 percent, respectively. Under simple and strict quarantines, that fall is only 3 percent and 1 percent, respectively. Health outcomes are also better under both quarantine policies. With no government intervention, roughly 0.15 percent of the population eventually dies because of the epidemic. Under simple and strict quarantines, that fraction falls to 0.1 percent and 0.01 percent, respectively. So testing and quarantine policies are win-win from an economic and a health perspective.[5] For that reason they are far more likely to be politically sustainable.

A central feature of recessions, including the current one, is positive co-movement between output, hours worked, consumption, and investment. A natural question is whether models of the type discussed above generate co-movement in a recession caused by an epidemic. ERT (2020c) allow for physical investment in three extensions of ERT (2020a): the neoclassical model, a flexible-price monopolistic competition model, and a New Keynesian model with sticky prices. Calibrated versions of all three models generate recessions in response to an epidemic. However, the neoclassical model fails to generate positive co-movement between investment and consumption. In contrast, both the flexible-price monopolistic competition and New Keynesian models succeed in doing so. The reason is that, as noted above, the epidemic generates a negative shock in the demand for consumption and a negative shock to the supply of labor. The first shock leads to a fall in consumption but a rise in investment as people try to smooth hours worked when the infection

[5] Increasing α beyond 2 percent reduces the economic costs of the epidemic but at a slower rate. A similar but less stark pattern emerges regarding death toll from the epidemic. See ERT (202b) for details.

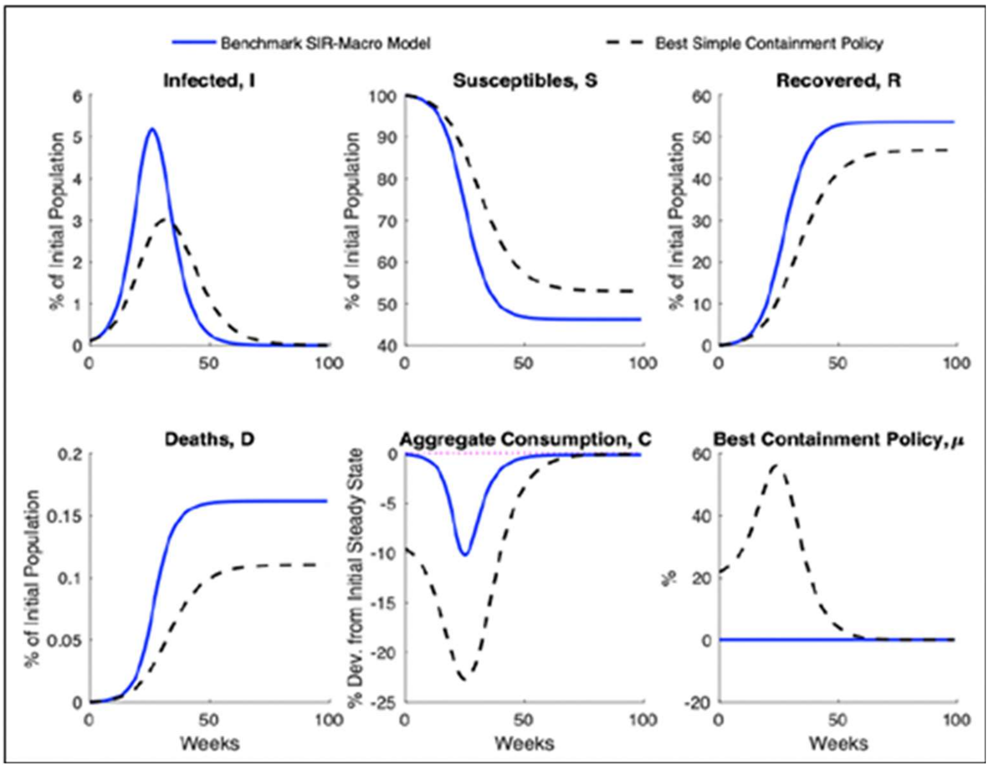
wanes and they want to consume more. The second shock leads to a modest decline in consumption but a substantial fall in hours worked and output. Significantly, investment falls because people want to smooth consumption in the face of a transitory fall in income. In the calibrated flexible-price monopolistic competition model, the labor supply shock dominates so that there is sharp decline in output, hours worked, consumption *and* investment. There is also a moderate decline in inflation.

The effect of sticky prices is relatively small. It is well known that nominal price rigidities exacerbate the effects of negative demand shocks. But they alleviate the impact of negative supply shocks.[6] Since both shifts are at work during an epidemic, sticky prices do not, on net, have a strong effect on the response of output to an epidemic. So policies that rely on sticky prices for their effects may not be particularly powerful during an epidemic-related recession.

In sum, epidemics like COVID-19 lead to large recessions, with protracted declines in hours worked, consumption and investment, along with moderate declines in inflation. That would be true even if the government did nothing at all to fight the health consequences of the epidemic. Fighting those consequences in a way that minimizes damage to the economy is the key to socially beneficial and politically sustainable policies. Brute-force containment policies do help with respect to health. But their economic cost is so large that they aren't politically sustainable. Testing and quarantine-based policies are far more promising. Testing is expensive but the social return is almost certainly enormous. Good health policy is good economic policy.

[6] See for example Gali (2015) and Woodford (2015).

Figure 1
Epidemic Dynamics, ERT (2020a) based on Calibration in ERT (2020b)



3. THE COSTS OF CROSSING THE COVID BRIDGE

Given market imperfections like financial frictions, recessions create inefficient job losses and bankruptcies. These inefficiencies are particularly relevant in the current recession. Suppose that a vaccine for COVID-19 was developed. Workers and firms would be just as productive as they were before the epidemic. But bankruptcies mean that otherwise efficient businesses are permanently lost along with their firm-specific capital. Likewise, unemployed workers would lose skills and possibly become disengaged from the labor force. Surely there are large social returns from keeping productive firms and workers on life support until vaccines are developed.

Central banks around the world responded with great force and ingenuity to the initial impact of the crisis. The critical task faced now by policy makers is to build a bridge over the COVID crisis. Good policy will have to balance inefficient job loss and bankruptcies against the necessary re-allocation of resources across sectors. The right balance of unemployment insurance, contingent loans to firms, and Kurzarbeit-type programs will vary across countries. I have no doubt that these programs will be costly in the short run. But we should not be paralyzed by these costs.

To be clear, the recession we are facing is severe. The IMF (WEO, June 2020) forecasts that Israel's economy will contract by 6.3 percent in 2020 and won't return to its pre-crisis level until 2022. Israel has responded to the crisis with expansionary monetary and fiscal policy. On April 8, the Knesset approved a package of NIS 80 billion (about 6.1 percent of 2020 GDP), which includes NIS 11 billion for health expenses. On June 2, the Knesset adopted a 14 billion (about 1.1 percent of 2020 GDP) expansion of the package. Tax revenues have declined, as they always do in a recession. So the government budget deficit is ballooning.

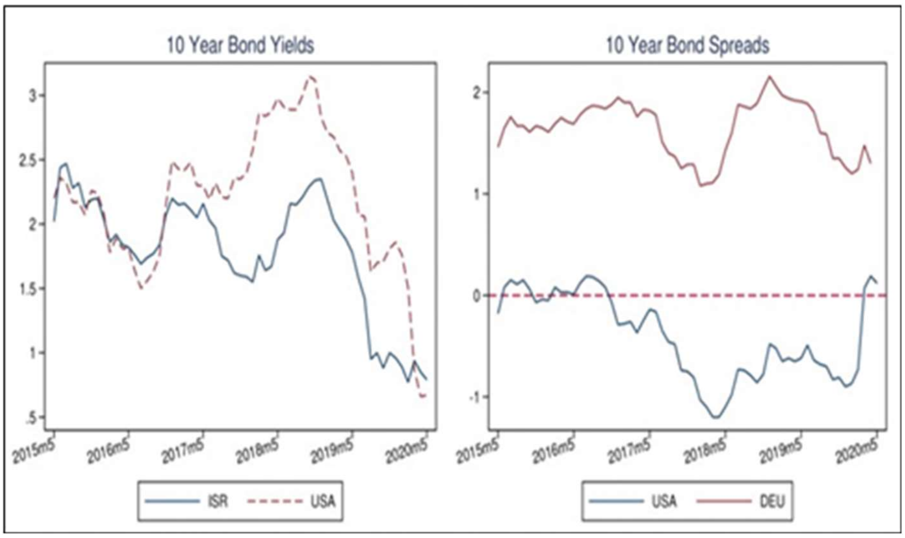
But Israel has lots of fiscal space within which to maneuver in its battle against the recession. First, Israel has been much less aggressive than other developed economies on the fiscal front. Benmelech and Tzur-Ilan (2020) document the fiscal response, inclusive of government guarantees, of different countries to the COVID-19 crises.[7] Their analysis of roughly eighty countries places Germany in the lead with a response equal to roughly 28 percent of GDP. In contrast, Israel's response has been about 11 percent of GDP, well behind the U.S. and many Western European counterparts.[8] The precise rankings of the different countries will vary over time. But it is clear Israel has not, to date, been very aggressive by international standards.

Second, and most tellingly, bond markets show no concern whatsoever about Israel's current or medium-run fiscal situation. Ten-year bond spreads, vis-a-vis the U.S. or Germany, are the same as in 2015 (see Figure 2). Israel can currently issue ten-year bonds at annual interest rate of less than one percent. Surely the social rate of return to Israel on preserving human and firm capital in the face of a very rare disaster is higher than one percent.

[7] Their measure of fiscal spending includes deferred and canceled taxes, strengthening the social safety net, direct grants, wage subsidies, money transfers, income support, and government guarantees.

[8] Israel's fiscal response, as percent of GDP, is roughly equal to that of Cyprus, Latvia and Brazil.

Figure 2
Yields and Spreads on 10-Year Israel Government Debt



4. CONCLUSION

The way to end the COVID recession is to control Covid-19. We will not have a convincing, robust recovery until we do. Perhaps we can accomplish this goal with smart testing and quarantine policies along with complementary measures like wearing masks in public spaces. Perhaps we will have to wait for vaccines. In the meantime we must design politically sustainable, smart health policies that minimize the economic costs of the COVID-19 recession. We also need to implement policies that bridge that recession, minimizing any permanent damage to our productive capacity. Granted, we don't know how long the bridge will have to be and how much it will cost. But markets are telling Israel that it has lots of scope in designing that bridge. Are there risks that we will the bridge a bit too long? Sure. But what mistake will we regret more - building a bridge that is too short or too long? To me the answer is clear. It is better to err on the side of too many rather than too few programs that help workers and firms bridge this once in a hundred-year crisis.

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